STARTUP

A Silicon Valley Adventure

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For Lily Layne Kaplan
Born August 28, 1994

Prologue

GOING, GOING, GONE. The auction was over. The last of the obsolete personal computers, engineers' cubicles, and other debris of a corporate shipwreck was finally liquidated, sold piecemeal to a crowd of hopeful entrepreneurs looking for a bargain to help float their new ventures. A few curious bottom fishers hovered around the stacked remains of electronic pens, flat-panel displays, and plastic cases, picking over the artifacts of the dead company's product: a portable computer operated by a pen instead of a keyboard.

To those of us who had pinned our hopes on this novel concept, the auction seemed vaguely sacrilegious, like watching treasure hunters dredge up human remains in their search for valuables. But it was clear to me, as the person who had launched the enterprise in the first place, that our passions and ideas had simply outlived their host, only to take root elsewhere in Silicon Valley. GO Corporation, and its offspring, EO, never quite found its market, but the concept of a pen computer remains as seductive as ever.

Still, I had to accept that impossible, final truth: GO was gone. Six years, hundreds of jobs, $75 million—all gone. If statistics were all that mattered, the story would end here. But behind the numbers lies a portrait of life at the edge of the corporate universe, where the intrepid and the imprudent play a perpetual high-stakes game of creation. The goal is to establish new companies, magical engines of prosperity that spawn products, jobs, and wealth. The price of admission is a radical idea, one powerful enough to motivate people, attract investment, and focus society's energy on improving the way people work and play. But there is also a darker side to the story, a cautionary tale about what can happen to a young company when its timing is wrong, its technology too speculative, and its market not yet ready.

As the winning bidders arranged to pick up their goods, I realized that the origin of GO could be traced back well before its founding in 1987, to a day in early 1979 when I first learned the truth about scientific progress from my Ph.D. dissertation advisor at the University of Pennsylvania.

A shy Indian man with a shiny, balding head and an occasional stutter, Dr. Joshi was widely known for his brilliant work in artificial intelligence. Our weekly meetings to help me find a thesis topic were more like therapy sessions than academic discussions. Most of the time he would sit silently behind his desk, watching me wrestle with some difficult question at the blackboard. When I was particularly down, he would offer a cryptic bit of encouragement: "You're not wrong, you know."

I had spent the past several months puzzling obsessively over an obscure problem in computational linguistics. One day, I explained to Dr. Joshi that I had searched the entire library for a clue to the solution, but without success.

"Perhaps you should try a different approach, Jerry."

"Like what?"

He pointed to the clock on his wall. It was round with no numerals, only single tick marks for the hours. "What time is it?"

"Four-thirty." I thought he was pointing out that our hour was up. Instead, he walked over and rotated the clock a quarter turn to the right.

"Now what time is it?" In its new position, the clock looked exactly as it had before, except for the position of the hands.

"Seven forty-five."

"Are you certain? Rotating a clock doesn't change the time, does it?" He had a point, but I didn't know what to make of it. "It only says four-thirty because someone decided that's what it means.

What's on the wall is a dial with two hands, yet what you see is the time." I was still confused. He sighed, then continued. "All that's happened is that you've walked to the edge of the great mosaic of human knowledge. Up until now, you've been living in a world full of ideas and concepts that other people have set out for you. Now it's your turn. You get to design a piece of the mosaic and glue it down. It just has to fit with what else is there. And if you do a good job shaping your tile, it will be easier for the next person to fit his around yours."

"You're saying that I've been looking for an answer when really I should be making one up?"

He looked relieved. "Don't believe the bull about science being only an objective search for truth. It's not. Being a scientist also requires the skills of a politician. It's a struggle to define the terms, to guide the debate, and persuade others to see things your way. If you're the first one there"—again he pointed to the clock—"you get to say what it is that others will see."

As I drove back to my apartment, the answer to my problem came to me. When I got inside, I called Dr. Joshi and gave him a hasty review of my thinking. I could hear the sound of chalk against blackboard as he worked out the logic. After a long silence, he finally spoke. "Beautiful. Now all you have to do is write it up and get out of here. There's nothing else I can teach you."

Surely, I thought, he was being funny—this was just his way of complimenting me on a good idea. "Come on, that's not true at all!" I said.

"I suppose there *is* one other thing." He suddenly sounded more serious.

"What's that?"

"Just remember that ideas last longer than people or things. Your ideas will go further if you don't insist on going with them."

You know, he was not wrong.

The Idea

"IS THIS THING war surplus?"

"Huh?"

The taxi driver didn't get it. We were racing down a narrow road in the suburbs of Boston, lurching from pothole to pothole. Each bump rattled the vehicle as though a shell had exploded nearby. The maroon logo on the door read "Veterans Taxi." The driver was vintage antiwar sixties—short graying beard, ponytail held by a rubber band, and a Cossack hat with ear flaps as a concession to the bitter February cold. I was to meet Mitchell Kapor at Hanscom Field at nine A.M. sharp to check out his new toy, a personal jet. The trip from the Cambridge offices of Lotus Development Corporation—the company he had founded in 1982, only five years earlier—was supposed to take less than thirty minutes, but I was late, and lost. Mitchell had been clear that he wanted to depart promptly so we could arrive in San Francisco in time for his lunch appointment.

The pavement widened without warning, and a stoplight signaled our reentry into the civilized world. The access road circled the field to the Butler Aviation terminal, where the private planes were parked. As instructed, we drove through an unobtrusive gate onto the field. Several small planes and a single jet sat in the passenger loading area, randomly scattered like animals maintaining a safe distance at a communal watering hole. I was relieved to see Mitchell just ahead of us, pulling suitcases and tote bags from the trunk of his dark gray 1984 Audi sedan.

The unmarked jet was painted a nondescript brown and beige. A narrow gangway of four or five steep steps was carved out of its middle. Two large men in vaguely official dark blue outfits sporting epaulets and caps stood at ease on either side of the stairs, waiting for a limousine to deliver their new boss, the founder of the world's largest independent software company. They nervously eyed the two young men in blue jeans struggling toward them with bags hanging off both shoulders.

"Can we get some help, please?" Mitchell bellowed. The two men froze momentarily, realizing that this young guy with shirttails hanging out the back of his ski jacket was their man. They ran forward to relieve us of our luggage.

"Good morning, Mr. Kapor," one of the crewmen said.

"Call me Mitchell, and this is Jerry. He's hitching a ride today. We're splitting the gas."

Mitchell laughed at his own joke. The operating cost of the craft was more than a thousand dollars an hour, much of which was high-grade jet fuel. The crewmen glanced at each other in disbelief and then introduced themselves as the pilot and copilot.

We climbed the steps to find a cramped, tubular cabin decorated in dark brown fabric and wood paneling. It looked like a miniature old-fashioned men's club. There was a narrow aisle down the middle, just tall enough to stand in, with four seats along the right but only two seats along the left, followed by a couch long enough to lie down on. I imagined that the couch was there in case the jet's owner got lucky with a passenger—a sort of airborne version of the mattress in back of a pickup truck. Mitchell, a devoted family man, wouldn't see it this way, but I was single and more attuned to such possibilities. A custom-made bar, with cutouts for bottles, displayed the varieties of hard liquor favored by the previous owners—a bank whose executives had lived well before falling on harder times. There were also several Cuban cigars and packs of playing cards.

"We can get rid of this stuff," Mitchell said. "Some Diet Coke and sugarless gum would be fine."

His face impassive, the pilot made a note.

I first met Mitchell Kapor in 1984, when he wandered into my office unannounced and asked what artificial intelligence might mean to personal computers. I was a logical person to ask, having completed my Ph.D. in the field five years earlier.

After graduating from Penn in 1979, I joined the research staff of Stanford University. Stanford ha the pace and style of a country club, with research grants blowing in through every open window. After slaving away for years on graduate studies and working every odd job I could find to support myself, I felt as if I had died and gone to heaven. It was a dream job, with virtually no responsibilitie other than to think about something interesting and write up my ideas once in a while. In the absence of any objective measures of success, the tenured professors in the computer science department tool to alternative means of establishing their self-worth, mainly by infighting and collecting academic titles. After about a year and a half of pastoral bliss, I concluded it was unhealthy to retire at the vital age of twenty-eight.

Early in 1981, everyone in sight was starting companies. I was unexpectedly offered the opportuni to join a new artificial intelligence company called Teknowledge, formed by a group of Stanford professors. Teknowledge built expert systems, computer programs that used knowledge gleaned from human experts to reason through complex problems, like diagnosing obscure forms of cancer.

Accustomed to the academic environment, the researchers did their work on large, symbolic computers called LISP machines, oblivious of the personal computer revolution taking place around them. The LISP machine was a classic boondoggle, built mainly under government grant and sold mainly to government research projects. An expensive, high-performance computer, the LISP machin was to the personal computer what an F-15 fighter jet was to a Cessna 150.

About two years into this endeavor, I suspected that similar results could be obtained at far lower cost on a personal computer. So I commandeered an IBM PC and started to write programs in my spare time. Within a few months, I had a number of promising prototypes up and running. In a remarkable coincidence, this was precisely when Mitchell came to visit, asking his question.

We immediately hit it off, and talked about how to design a flexible database to manage personal information—notes, ideas, to-do lists, phone messages, and the like—as opposed to corporate data such as billing and inventory records. Mitchell offered me a consulting contract to develop these idea into a product, working directly with him and another scientist named Ed Belove. I could work at home, in the wooded hills just west of Stanford, with occasional visits to Lotus's offices in Cambridge.

For the next year or so, I lived and worked alone for extended periods, accompanied only by my ca Critter P. Spats, the sole remaining evidence of a long-gone live-in girlfriend. Realizing that I might benefit from greater human contact, I took the proceeds from the sale of my Teknowledge stock and purchased a condominium on "crooked" Lombard Street in San Francisco. The constant flow of tourists down this cobblestoned landmark made me feel as if I had moved out of the wilderness onto the banks of the river of humanity. The cat loved the extra attention.

Shuttling to Boston about once a month, I worked closely on the Lotus project with Mitchell and Ed. Our efforts resulted in a new type of program we dubbed a personal information manager, or PIM As the project neared completion, we officially named the product Lotus Agenda. In February 1987, was hitching a ride back to San Francisco on Mitchell's new jet to show him some extra features we' added to the product at the last minute.

Once we were on board, Mitchell started to search through his luggage. There were tote bags and briefcases everywhere. It was essential that the discriminating technophile travel with a variety of computers, portable phones, organizers, chargers, adapters, cords, and extra batteries, as well as the latest industry weeklies, computer magazines, and newspapers. I wondered if this was why Mitchell

felt he needed his own jet—checking all this stuff on a commercial flight would be a nightmare. When he was comfortably ensconced in a fortress of electronics, he took off his ski jacket, revealing his trademark outfit: a formal Hawaiian shirt (white background) over loose-fitting jeans. Mitchell was a big man, nearly six feet tall, and walked with a boyish bounce. He had a wave of dark hair with a touch of gray at the temples, betraying his thirty-six years. His two front teeth were slightly askew, giving him the faintest aspect of a woodchuck, which was seconded by his zeal and diligence. I could see that he was perspiring lightly from our hurried boarding.

I looked like a junior Mitchell, the same height but twenty pounds lighter, though my hair was a bit more gray. The same ill-fitting designer jeans—crafted for some platonic GQ ideal, not a son of Abraham—curved under my waist and hung loose around my rear. Inevitably, the bottom button of my shirt fell above the belt buckle, leaving the shirttails free to wander their separate ways, revealing a roll of flesh. Like Mitchell, I was locked in perpetual battle with my weight, but the stakes were higher—I couldn't afford to carry the girth of a typical middle-aged husband, for fear of never becoming one.

We settled into the front pair of seats.

"Put your seat back in the full upright position, and fasten your seat belt tight and low across your lap," Mitchell admonished me with mock seriousness.

We spent the next several minutes repeating verbatim the inescapable Big Brother rituals of the commercial airlines. We were soon laughing hysterically, and the pilots must have thought we were nuts. After taxiing a short distance, we were off the ground, climbing at a steep angle. We sat in silence for the next few minutes, watching the ground recede and feeling very regal.

As soon as we leveled off, Mitchell pulled out his latest gadget—the lightest, most powerful portable computer available. This remarkable machine, the Compaq 286, packed all the power of the most recent generation of desktop personal computers into a box about the size and weight of a small sewing machine. The numeric designation 286 was not selected at random. It indicated that the product contained at its core a microprocessor chip called the 80286, designed and manufactured by Intel Corporation.

In the mid-1980s, computer cognoscenti had a penchant for substituting technobabble for plain talk. This served a useful purpose. Learning to use a computer—much less to program one—required a level of personal commitment commensurate with learning the piano, and a similar level of innate talent. It attracted people who had difficulty with the messy business of human relations, preferring instead the company of predictable and infinitely patient machines. This devotion was rewarded with valuable skills and friendships. Former wallflowers suddenly found themselves accepted into a new society of like-minded people who were more comfortable communicating through electronic mail than face to face. Now they could mask their awkwardness behind CPUs, RAMs, and modems. Geeks became chic.

A secret language was the key to the club, like the lingo used by each generation of teenagers to identify kindred souls and exclude ignorant grownups. It made the members of this new caste feel special, smarter than everyone else. The embarrassment that ordinary people felt about their lack of computer knowledge only reinforced this feeling. But just knowing the model number of a computer wouldn't help you join the secret society—you had to know how to *pronounce* it. Nowhere was it written that 80286 should be read "eighty, two eighty-six," as opposed to "eight-zero-two-eight-six" or some other variation. Welcome to the club.

"Bear with me," Mitchell said. "I've got to update my notes." He began to rifle through his pockets, pulling out small pieces of paper. Some were yellow stickies, some were pages ripped from a spiral-bound pocket notebook; there was even the stray napkin or gum wrapper. Mitchell was a prolific note taker, jotting down every interesting idea and reference within earshot. You never knew when he was

going to strike out and appropriate the nearest writing implement and fragment of paper. On one particularly frantic occasion, I saw him tear the corner off a page of the *New York Times* and write in the L-shaped margin.

Making sense of this motley collection of ideas, phone numbers, and reminders was Mitchell's passion. That's why he was so committed to Lotus Agenda—he desperately needed the product himself. He powered up the Compaq 286 and waited while the machine went through its lengthy startup process.

Mitchell rolled his eyes, whistled, and tapped his foot in exaggerated impatience. With Agenda finally up and running, he began typing in his accumulated scraps of notes with the efficiency of an executive secretary.

"You know, this is really the pits," he said. "It doubles the time it takes for me to keep organized. I wish there was some way for me to get all this stuff directly into the computer and skip the paper."

That sounded like a challenge to me.

"Look, Mitchell, it seems that the real question is how small and light you can make a portable computer."

"Well, what are the largest components?"

I thought for a second. "The disk drives are one problem. They probably weigh about two pounds each. Next is the power supply, the battery. Another few pounds. The display isn't really that much, but the two layers of glass are pretty heavy. Next is the keyboard, I guess. It doesn't weigh a lot, but it's pretty big."

"Yeah, and you can't shrink it much and still be able to type normally," Mitchell added. "Below a certain size, you'd have to poke at it with a finger rather than really type. That's why the pocket organizers stink. They're really just overgrown calculators that you can stick a few names and phone numbers in." He was referring to gadgets like the Sharp Wizard that let you store a small amount of information in addition to doing arithmetic. These products were purchased on impulse and, inevitably, soon abandoned in a drawer until the batteries leaked.

"Other than the keyboard, though, it ought to be possible to build something pretty cool, sort of flat like a book," I said. "You could have a flat display with all the electronics on a single board just behind it, and maybe a flat battery, like a sandwich. Instead of disks, you could use SRAM for the data." SRAM stands for static random access memory. It is like normal computer memory but requires much less power to keep the memory "alive," and so places only a modest demand on a battery to retain its contents while the computer is turned off.

"The interesting thing is, in principle you wouldn't need to load and save files. You could just leave the programs running and the files loaded all the time." Mitchell was getting into it now. In fact, we were both cooking. This was the fun part of the business, imagining possibilities. With technical breakthroughs announced every week—smaller disks that stored more data, faster microprocessors, denser memory chips—anyone could combine these parts and build a new product or create a new market. "But the problem is still the keyboard," he said.

"Not only that, it's not always practical to type when you want to take a note." I waved my hands in the air as though typing on an imaginary keyboard. "You have to set the computer down somewhere to free up your hands."

Mitchell picked up on my thought. "Even in meetings it's a problem. Only propeller heads use laptops in meetings, and it's always distracting."

We continued exploring this line of discussion for some time until the pilot stuck his head into the cabin, bearing a plastic tray of half sandwiches, some cut-up vegetables, and a container of dip. "Waddaya want to drink?" he asked.

Mitchell and I looked at each other, realizing that we weren't going to get the usual choice of beef,

chicken, or "today's light fare." After pulling off the plastic wrap, we picked our way through the ~~soggy assortment of mystery meats, topping off the meal with a delightful medley of miniature~~ candy bars.

After lunch I settled in for a brief nap, tired out by Mitchell's intensity and the carbohydrates. Besides, I got my best ideas in my sleep.

Mitchell Kapor had wandered into the computer business along with lots of other underemployed but energetic young men at the time. The difference was that he had struck gold, while most others were still panning dirt from barren streams.

In the late sixties, times were tough for college kids with a social conscience—the deaths of Bobby Kennedy and Martin Luther King, the My Lai massacre—which lured Mitchell away from starting down the Wall Street fast track and toward a life of manning protest barricades and experimenting with psychedelics. Like many, he eventually concluded that writing software for personal computers seemed a promising path. He learned the BASIC programming language and ultimately landed a contract to develop a business graphics package for Personal Software Corporation, later known as VisiCorp, which produced the hugely successful Visicalc spreadsheet program.

His product, Visiplot/Visitrend, read data from the files saved in Visicalc and displayed the numbers visually on graphs and charts. While this was a handy thing to do, it was awkward to save a file, exit one program, start up another, and load the file again just to get a look at a graph. So Mitchell conceived of a new and better product that integrated these functions. As required by his contract, he offered the idea first to Personal Software. The company passed.

By the fall of 1981, a special breed of investor was scouring the Silicon Valley like a big league scout, searching for young entrepreneurs with promising ideas. These venture capitalists—usually called VCs—were known to put a million dollars on the table overnight for the right opportunity. It was a modern California gold rush.

This overheated climate created a feeding frenzy around personal computers and software. Mitchell approached Ben Rosen, a former Wall Street analyst, and L. J. Sevin, a colorful Texan, with his idea. This unlikely pair had formed a partnership to grab a piece of the action, which they did with a vengeance. Rosen had used some of Mitchell's software, and liked it. They cut him a check and went on to their next deal. Mitchell named his new company Lotus Development Corporation because of its countercultural, oxymoronic tone, like the name Apple Computer.

Lotus was in a race with several more established competitors, and he knew it. Most industry people thought Lotus was crazy to try to unseat Visicalc, which dominated the market at that time. But Mitchell intuitively understood something that only the Japanese taught in school: in a fast-growing market, what matters is your share of *new* machines, not existing ones, because new machines quickly come to dominate the market. When IBM announced that it would be bringing out its own version of the personal computer, to be called the IBM PC, Mitchell directed his programmers to tailor their program to this machine.

In 1982 a crop of new and improved spreadsheet products were slated to debut at COMDEX, the computer dealers' exposition held every November in Las Vegas. The Lotus team scrambled to ready their product, which they named 1–2–3. Mitchell decided that to beat the competition, Lotus had to come out of the starting gate with a bang, so he committed the unheard-of sum of $1 million to marketing and promotion. Mitchell knew it would all be over by Christmas, one way or the other—they would ride the IBM PC into orbit or be marooned in the Las Vegas sand.

As the last dusty moving vans carted away the exhibit booths from the Las Vegas Convention Center, it was clear that Lotus 1–2–3 was a major winner. Lotus's heavy promotion had created a larger-than-life impression, and more important, one that dwarfed its competitors.

Rosen and Sevin knew they had hit the jackpot, and soon trotted the fatted calf off to Wall Street for sale in an initial public offering. With the IPO, Lotus became the darling of investors and an instant emblem of the success of the American capitalist system. Mitchell Kapor, still a compassionate and philosophical proponent of the counterculture, found himself invited to meet the governor of Massachusetts and was profiled in the *New York Times*. It was as though the megaphones had abruptly gone silent and someone had politely explained to him that it was all some terrible mistake—would he please come across the police line and tell the nice officials what he thought they ought to do. To top things off, he was now rich.

Half an hour later, I woke up with the strange feeling that I had just forgotten something important. I turned to Mitchell, who was still clicking away on his Compaq 286, and stared at him.

"You OK?" he asked.

I was quiet for a moment, trying to get my bearings. Suddenly I knew what was bothering me. "Mitchell, suppose you used a pen instead of a keyboard."

"What do you mean?"

"Suppose that instead of typing in text, you write with some sort of stylus directly on the screen. If it was possible to sense where the tip of the pen was, electronic ink could appear on the screen right under it, and it would look like you were drawing a line, or writing. The trick is to turn the handwriting into regular text or numbers. I'm sure there are algorithms that do this."

"What about the function keys?" Mitchell was referring to the non-alphabetic keys on a keyboard that allow you to issue commands like paging up or down, saving or loading a file, deleting a word, and so on.

"I don't know. I guess you could figure out some way to do that stuff with the pen too—like tapping on icons or menus. The point is to eliminate the keyboard."

"A device like that would be more like a notebook or pad of paper than a laptop," Mitchell observed. "In fact, the thing would be so different, you'd need a whole new approach to software."

We both sat in stunned silence as this insight sunk in. People had certainly thought about pens and computers before. We had both seen electronic tablets attached to desktop machines, which were mainly used by drafters and artists. But these tablets had always been just another type of input device, an accessory to the keyboard and the mouse. This idea was different. We had put it all together, combining simple, familiar elements into something radically new. We recognized that an electronic pen, without a keyboard, could create a completely different device.

Almost like clockwork, every ten years since the beginning of the computer revolution, a new class of computers had unexpectedly emerged.

In the 1960s, the popular image of a computer was a room full of mysterious, monolithic boxes the size of refrigerators, with spinning tapes and banks of flashing lights. These remote, intimidating mainframes were housed in special rooms with raised floors, filtered air, and glass walls which looked like an intensive care unit for electronics. With the advent of the minicomputer in the 1970s, the popular conception of a computer began to shift. These were smaller boxes that could be hidden in a closet or storeroom and connected to terminals sitting on the desks of engineers, bank tellers, and travel agents. In the 1980s, the personal computer took its place as the dominant form of computing. Now a computer was an individual productivity tool, consisting of a video screen sitting atop a rectangular box with a slot for floppy disks.

This historical progression was not just about the physical look of the machines. With each wave of devices came whole communities of customers, operating systems, applications software, and companies. Subsequent generations didn't supplant the previous ones; they empowered different people by solving different problems. Like some profound new form of energy, the underlying

constant—computing power—had no shape or substance. Each type of computer simply delivered this power in a different way.

Until that moment on Mitchell's jet, it had been difficult to imagine what the next generation of computers might be like. There was an obvious trend toward faster, smaller machines, but it was hard to see how the basic character of the computer would change. Entrepreneurs had made so much money from the personal computer industry that many believed the computer revolution had achieved a kind of final, perfect form. It seemed that the personal computer was right for all people—they just didn't know it yet. It was only a matter of time before everyone, from the CEO to the youngest schoolchild, would use one.

Mitchell and I had stumbled upon a plain truth: personal computers are deskbound, like typewriters, and are unsuitable for people who spend their time away from a desk or work face to face with others. There are segments of the population that fit this profile—salespeople, inspectors, consultants, and delivery people, to name a few. They certainly have access to computers back in their offices, but this isn't where they really do their business. Moreover, the problem isn't just taking a computer with you; it's how you use it in the course of your work. In meetings with colleagues and clients, mobile professionals use pen and paper—notebooks, folders, and calendars—because these don't interfere with the interpersonal communication so critical to their jobs. Still others—the clipboard crowd—need to write while they are standing up or walking around.

Mitchell and I both instantly understood that the key to the next wave of computing was to create a device that worked like a notebook instead of a typewriter. The impact of this insight, so obvious and yet so novel, overwhelmed us. We shared a sense of seeing something utterly new and important, like the adventurers who had first encountered the Rocky Mountains, now five miles beneath our feet.

This unique emotion—the modern scientific version of religious epiphany—is startling in its raw power and purity. I had experienced it previously only once or twice in my life, always at an unexpected moment after months of struggling with an impossible problem. It is reserved for those rare occasions when you, and you alone, know something that no one else knows. The poet Edna St. Vincent Millay wrote that "Euclid alone has looked on beauty bare." And now Mitchell and I knew exactly what she meant.

We were momentarily unable to speak. I saw Mitchell's eyes become glazed and teary.

As we started our descent into San Francisco, we regained our composure and began fleshing out the details of the concept. The tone had abruptly shifted from an intellectual exploration to something very personal. We knew we had to pursue this. "You do realize what this means." Mitchell's voice tightened as he spoke. "A whole new operating system, a whole new model of how the user will work with the system."

"Hell yes," I said. "There's a lot of far-out research to be done. The first thing is to answer some basic questions, like what resolution is required to display writing legibly on a computer screen, and whether it's possible to write directly onto the surface of a flat display."

"Then, of course, it all hinges on how good the handwriting-recognition software is." We both said something like this simultaneously, and laughed as though we had bumped shoulders trying to walk through a door at the same time.

"Hey, look," Mitchell said, "I'm having lunch with this great guy at Apple, Steve Sakoman, who's sick of the place and wants to leave. He's in charge of hardware engineering for the Macintosh, but he wants to do something more exciting with portable computers and he isn't getting any management support. I'll talk to him about this and see if he thinks it's feasible."

"Since this most likely involves a new operating system, maybe Gates would be interested." I was referring to Bill Gates, the techie founder and chairman of Microsoft, at that time the second-largest PC software company after Lotus. Mitchell stared at me with a dark intensity.

"You don't understand. The PC business is *war*." He spoke as if announcing this to a crowd. "Eithe
you fight or you're a casualty. You have to look the enemy in the eye and never, ever blink."

I wasn't sure why Sakoman at Apple was an ally and Gates at Microsoft was an enemy. But clearly
that's what Mitchell meant.

As the plane taxied to the private aviation terminal at San Francisco Airport, Mitchell and I packe
up our gear, ready for a quick getaway. His rental car was prepped and waiting next to the plane as w
rolled to a stop. A man in a Hertz shirt snapped to attention, ready to collect Mitchell's signature and
hand him the keys. For the big brass, the rental companies don't mess around.

The gangway sprung open with such force it rocked the plane. "I'll call you tonight," Mitchell said
and took off south to Cupertino like a guided missile. As I hiked to the parking lot to pick up my car,
could tell I wasn't going to get much sleep that night. Or, for that matter, for the next few years.

Within a couple of weeks we had become thoroughly enchanted with the idea of a pen computer. Ove
the previous few years Mitchell had grown bored at Lotus, where he was increasingly called upon to
play a ceremonial role, presiding at product announcements and board meetings. As he shed his
operating responsibilities, in part to work on Agenda, he joked that he was becoming a rabbi—reduce
to reciting blessings on special occasions. The Agenda project had rekindled in him the unique feelin
of working with a small, close-knit team of engineers, reminding him of the early Lotus days. But
Agenda was just a taste, and he wanted more. Perhaps the idea of a pen computer was a way to get it–
if he could build the right kind of spirit.

After several preparatory one-on-one meetings, he called together his hand-picked team of
collaborators for the new project. In addition to Mitchell and myself, it included Peter Miller, a
brilliant and erudite software project manager from Lotus, and Steve Sakoman, the restrained and
thoughtful hardware engineer whom he had visited at Apple Computer in Cupertino. We met in a suit
at the Kendall Square Marriott in Cambridge. Outside, the last piles of salty winter slush were fading
in the fresh spring air.

Peter was like a walking *New York Times* crossword puzzle—an elaborate tessellation of obscure
facts fitted together into a pleasing pattern. His pot belly and halo of gray hair made him look like a
latter-day Friar Tuck. In contrast, Steve had a clinical, focused style. He dressed in various shades of
plain, like a Norman Rockwell painting of a practicing engineer. His nondescript chinos precisely
fitted his lean frame; all pocket flaps were neatly pressed flat and buttoned. Mitchell opened the
meeting by unrolling several architect's drawings on the conference table.

"As you know, I've taken a lease on half a floor of office space in the tower next door. Here's my
thinking about how we could lay out the offices . . ."

For anyone else, this would have been a classic "presumptive close"—proceeding as though an
agreement had already been struck among the participants. In Mitchell's case it was raw enthusiasm
harnessed for a special purpose: it allowed the team to practice collaborating on a non-threatening
subject. We studied the documents. To my surprise, a spirited discussion ensued.

When Mitchell had achieved an acceptable level of give and take between the participants, he
steered the discussion to the core issues: equity, financing, and the nature of the project itself. It
slowly emerged that each of us had a different agenda. He was interested in building a new company
that would recapture the teamwork and momentum of the old Lotus without repeating the same
mistakes. Peter was interested in designing an "object-oriented" computer interface that would knit
together diverse documents, spreadsheets, and databases in a coherent, organic whole. Steve wanted t
build the leanest, flattest computer possible. I wanted to deliver a practical pen computer for working
professionals. In each case, our goals for the project reflected our respective personalities and vision
of a better world.

The meeting stretched on until late in the afternoon, by which time Mitchell had deftly built a strong ~~sense of unity, despite the fact that the project was still far too vague and broad to be practical~~. Each of us took our action items: Mitchell would line up financing, legal counsel, and facilities; I would investigate handwriting recognition; Peter would think about object-oriented interfaces; and Steve would notify his superiors at Apple that he would be leaving to join our venture.

We finished up with an easy topic: naming the new company. We wanted something short and striking that would project a sense of mobility. Mitchell thought we should consider a two-letter word as a name, and proposed GO. I suggested ON. Peter observed that "On Technology" contained the word "ontology," the study of being. So we went with ON.

Forming a new company is like starting a romantic relationship. The early phase is emotionally volatile. You have to build confidence, establish a sense of fairness and balance. If one person feels he is investing more of his feelings, without reciprocation, the situation can quickly get out of hand, resulting in stormy mood swings ultimately leading to disaster. Continual contact and reassurance are essential. That's why the three-week gap until our second meeting was a dangerous interval.

The meeting was to last for two days, over a weekend. I was staying at Mitchell's house, and Steve stayed at a hotel. At the outset Mitchell worked hard to recapture the enthusiasm of the earlier meeting. However, I noticed that Steve seemed distracted and less involved. That evening, after our first session, I mentioned my concern to Mitchell, who hadn't openly acknowledged Steve's change of mood. Mitchell restrained his natural exuberance and sat quietly for a moment.

"What do you think is happening?" he said.

"Maybe he's having second thoughts. He's being asked to give up a lot—a high salary, great benefits, a secure senior position at Apple, moving his family to Boston—"

"Or maybe he went in to quit, told them what we were going to do, and they made him a counteroffer," Mitchell suggested.

I was a bit startled by his sudden paranoia, but then realized that this was distinctly possible. Steve was a free agent, and at this stage no one really owned the ideas we had been batting around. He was well within his rights to pursue the project at Apple if he could get the required internal support for it.

The mere thought that Steve might defect caused Mitchell to feel betrayed. It undermined the sense of teamwork, of Musketeer-like commitment, that he was seeking to create. Even worse, Steve was in a position to walk off with the project and put the power and resources of Apple behind him.

Throughout the night, Mitchell's mood grew darker. Unable to check his suspicions out with Steve until the following morning, he became increasingly fearful of losing the fragile flame he had worked so hard to spark. By morning he was quite agitated. At his first opportunity, he confronted Steve.

"Steve, I'm a little concerned that you may have some doubts about proceeding with the project."

Always honest but tempered, Steve came clean. "Well, I talked to Jean-Louis, and he escalated the matter to Sculley." Jean-Louis Gassée, an opinionated and astute Frenchman, was president of Apple products, and he held John Sculley—the non-technical CEO who succeeded Steve Jobs—under a Svengali-like influence. Apple had a long-standing tendency to canonize its technical gurus, which was probably exacerbated by Sculley's personal doubts about his suitability to lead a technology company.

"I met with Sculley, and he asked me what it would take to stay and do the project at Apple," Steve said. "I gave him a straight answer—complete freedom, protected resources, a separate staff and site. He agreed to my terms. I have to give him a final answer this week."

Mitchell's worst nightmare had just come alive. But he had had an entire night to prepare an emotional defense. He spoke to the team. "You know, guys, I love this idea, but I think maybe we're moving too fast. Maybe I'm not ready to jump back into startup-land right after Lotus. I'd like to take

some time to consider what's really going to work for me and what's not." Under the circumstances, this ~~was a measured response, but I believe it was driven as much by personal disappointment as~~ self analysis.

That was it. Just as easily as the idea had started, the project was dead. "Easy come, easy go," I whispered to Peter as Mitchell and Steve attempted to make polite conversation.

But after the meeting broke up, Mitchell took me aside. "Jerry, I've been thinking. Why don't you try to do this project yourself? You're a smart guy . . ."

I was shocked. I thought of myself as an engineer, not a CEO. Mitchell had a reputation as a deft manager and business strategist. "But I've never managed squat."

"You think I had any more experience when I founded Lotus? Just remember, political history is written by whoever wins the war, and corporate history is written by successful entrepreneurs. All yo have to do is make a pile of money and everyone will think you're a genius." He chuckled and shrugged. "C'mon, I'll introduce you to some VCs."

The Deal

THE MODERN CORPORATION is quite possibly the highest form of human cooperation. Specialized resources in the form of labor, raw and finished materials, capital, and knowledge come together in a marvelous process that transforms these components into goods and services of greater value. This miraculous conversion is similar to the process by which dirt, water, sunlight, and a packet of information in the form of a seed are reorganized into a living plant. Like plants, corporations are born, grow, and die, reach out for resources, fend off predators, and compete with others. Businesses evolve over time, as less efficient corporations are replaced by more effective ones, whose successful practices are then emulated by others.

It is against this backdrop that the "startup game" developed. The startup game is an elaborate contest created to accelerate the pace at which corporations evolve, played continuously by an endless parade of hopeful entrepreneurs. It is a carnival game of life, testing the strength, aim, and skill of contestants willing to expose themselves, for glory or ridicule, to public scrutiny. The challenge is to find a new or better way to do business; the rewards are increased wealth, enhanced personal reputation, and control over one's own destiny. The startup game is designed to motivate our brightest, most creative, and hardest-working individuals to improve the use of society's resources, increase employment, and provide a broader range of quality goods and services. Here's how the game is played.

It begins with an aspiring entrepreneur who is willing to step right up and be tested. As in many other games, the player starts with an artificial currency—in this case, the stock of the new venture. The goal is simple: increase the value of the entrepreneur's shares, because when the game is over, these can be cashed in for real money. The trick is to swap some of the stock for three resources— ideas, money, and people—then use these resources to increase the value of the remaining stock.

The ideas are called intellectual property, which includes the business concept itself and any unique designs, processes, or plans for how to pursue the business. The intellectual property is safeguarded by trade-secret protection programs and by patents and copyrights.

The money comes from investors, usually a venture capital partnership. The venture capitalists, or VCs, get a special form of equity called preferred stock. This stock confers certain rights, known as preferences, such as the right to appoint someone to the board of directors.

People are usually assembled by recruiting friends and associates and by hiring headhunters to find them. These people become the employees, who are paid with a mixture of cash and stock. The cash is enough to cover reasonable living expenses, but is often less than the employees would earn at a stable, going concern. The stock is what they are really working for. It is a part ownership in the venture, a chance to participate in the game and pay for it with their own labor—which is why it is often called sweat equity.

The entrepreneur doesn't raise all the required money up front because that would mean selling too much of the stock. Usually, the initial investment is just enough to reach some identifiable milestone. This milestone is chosen to demonstrate to potential future investors that the company's prospects have improved, justifying a higher price for the stock, so that less of it has to be sold. If the money runs out before the milestone is reached, the game is over. In the meantime, other companies may try to steal the ideas, the people, and may even try to run the venture out of money.

Venture capitalists typically look for a reasonable possibility of making five to ten times their original investment within five years. This corresponds to borrowing money at 50 percent per year or

more (until recently, such an interest rate would have been considered criminally usurious). This high cost of capital makes the startup game a race against the clock.

The final step in the game is a financing event called an initial public offering, or IPO. The IPO—when the company is first listed on a public stock exchange—usually marks the transition of the enterprise from a risky venture to a profitable company. Up until this time, it is virtually impossible dispose of stock and get cash. Soon after the IPO, the entrepreneur is free to sell stock on the open market, as are the investors and employees. This marks the successful end of the startup game and the creation of a viable company. The entrepreneur can now cash in his stock and go home, take on the less risky job of managing a going concern, or step up and play the game again.

Soon after the disastrous meeting in Boston, Mitchell arranged an introduction to the legendary venture capitalist John Doerr, whose firm of Kleiner Perkins Caufield & Byers had backed such prominent technology companies as Tandem, Compaq, Sun, and Lotus. John asked me to drop by his office the following Monday to chat with some of his partners. I mistook this for an informal bull session, but any experienced entrepreneur would have known better. To VCs, Monday is as sacred as Sunday is to the Vatican. This is the day when venture capital partnerships around the world have the official meetings to review potential investments. All the partners participate, come hell or high water —by video conference call from a branch office if possible, or by speaker phone from their deathbed if necessary. An invitation to address the partners at a top-tier firm like Kleiner Perkins—or KP, as it is known in the trade—is an unusual opportunity. I was unprepared.

At the appointed hour, I showed up wearing a sport jacket with my shirt open at the collar. I carried little else but a maroon leather portfolio holding a tablet of paper and a pen which I had received as a Christmas gift. No business plan, no 35-millimeter slides, no charts, no financial projections, no prototypes.

The Kleiner Perkins offices were on the thirty-fifth floor of a posh office tower in the heart of San Francisco's financial district.

The floor-to-ceiling windows framed a spectacular panoramic view of the bay on one side and the city on the other. The partners' offices were extravagant by most standards, set apart from each other and from a large common area by smoked-glass partitions.

The previous presenter was just finishing up. Dressed in a dark blue pinstripe suit, his red power tie thrust forward with a gold tie pin, he was nervously fielding rapid-fire questions from a brigade of partners and associates inexplicably packed into a small corner conference room. A bare prototype circuit board sat on the conference table. A crisp color graph projected on a whiteboard; the man's perspiration gleamed in the reflected blue light.

"Thank you, we'll let you know our decision in about a week," said one of the partners. The presenter collected his belongings and left quietly.

After a short break, John Doerr reassembled the group and invited me in. He made a short introduction, covering my background and explaining Mitchell Kapor's interest in the project, then turned the meeting over to me. I was nearing a state of panic. I paused to size things up, knowing that the brief silence before diving in would create a momentary impression of authority. In reality, I was searching for a strategy.

I had a flash of déjà-vu. I remembered facing this same kind of "show me" crowd at my Ph.D. dissertation defense. The key to success there was in recognizing that although the examination committee had the power, I had the knowledge. The same was true here. I had done a lot more thinking about this topic than anyone else in the room, and to win their respect, I merely had to demonstrate this fact by keeping the discussion focused on the areas I had already investigated. I decided to lead with the business issues.

"Gentlemen, you probably think that there is no longer any way to make money by starting a new personal computer company. The competition is brutal, and the barriers to entry are high. However, I'm here to suggest to you the possibility that the PC as we know and love it may not be the best and final form that computers will take. I believe that a new type of computer, more like a notebook than typewriter, and operated by a pen rather than a keyboard, will serve the needs of professionals like ourselves when we are away from our desks. We will use them to take notes; send and receive messages through cellular telephone links; look up addresses, phone numbers, price lists, and inventories; do spreadsheet calculations; and fill out order forms. All of this can be done unobtrusively while sitting in meetings, conferring with clients, commuting to work on the train, or even when standing up and walking around. Like the fax machine, the pen computer can dramatically accelerate the pace and increase the efficiency at which business can be conducted.

"I can't say for sure when this will occur. But I do know that it will happen, and someone is going to make a big pile of money on it. With a little luck and some hard work, I think we could be the ones. Like the PC, I think this concept could come out of nowhere and take the industry by storm. I want to be the one to do it."

Having covered the business angle, and thrown in a gratuitous pledge of personal commitment, I proceeded to talk about the required technologies and the state of the art. The plain fact was that the project was technically very risky, and there was no point in hiding it. The greatest risk was whether machine could reliably recognize handwriting and convert it into its equivalent in computer text, known by the strange acronym ASCII.

My audience seemed tense. I couldn't tell whether they were annoyed by my lack of preparation or merely concentrating on what I was saying. Several people narrowed their eyes disapprovingly—or perhaps they were just deep in thought. I had been talking nonstop for about ten minutes, and figured I'd better close. Thinking I had already blown it, and therefore had little to lose, I decided to risk som theatrics.

"If I were carrying a portable PC right now, you would sure as hell know it. You probably didn't realize that I am holding a model of the future of computing right here in my hand."

I tossed my maroon leather case in the air. It sailed to the center of the table, where it landed with loud clap.

"Gentlemen, here is a model of the next step in the computer revolution."

For a moment, I thought this final act of drama might get me thrown out of the room. They were sitting in stunned silence, staring at my plain leather folder—which lay motionless on the table—as though it were suddenly going to come to life. Brook Byers, the youthful-looking but long-time partner in the firm, slowly reached out and touched the portfolio as if it were some sort of talisman. He asked the first question.

"Just how much information could you store in something like this?"

John Doerr answered before I could respond. "It doesn't matter. Memory chips are getting smaller and cheaper each year, and the capacity will probably double for the same size and price annually."

Someone else chimed in. "But bear in mind, John, that unless you translate the handwriting into ASCII, it's likely to take up a lot more room." The speaker was Vinod Khosla, a young man born in India and educated at the Stanford Business School, who was the founding CEO of Sun Microsystems. He acted as a consultant, helping the partnership evaluate technology deals. His cool manner masked fierce analytical mind and the competitive instincts of a gladiator.

Before John could respond, Frank Caufield, a partner known for his outspoken manner, pointed at him. "Storage won't matter with *John's* handwriting—it's completely illegible!" This was the break needed.

"Then you won't mind if I use his writing as a benchmark of our progress," I shot back. The rest of

the group fell silent and looked toward Doerr and Byers, to gauge their reaction to my impertinence.

~~They both chuckled, signaling their approval. Then the entire room exploded with laughter.~~ "At least I know how to type," John said.

From that point on, I hardly had to speak. The partners and associates traded good-natured barbs and insights as we fleshed out this new business opportunity. The single conversation split into two threads, then split again, as everyone offered a question or an opinion. It was beginning to sound like lively cocktail party. Periodically someone reached out to touch or examine my portfolio, which was bouncing back and forth among the participants. It had been magically transformed from a stationery store accessory into a symbol of the future of technology.

This din continued for several more minutes, after which Brook Byers called the meeting back to order.

"One last question," Byers said. "What are your personal goals for this project?"

I spoke slowly. "Well, I'm not in it to prove that I'm smart, or to prove that I can run a big company." I knew these to be two of the most common mistakes that would-be entrepreneurs make in starting a company. "I guess I have four goals. First, to produce a product that delivers real value to real people. Second, to provide an aboveaverage rate of return for the investors. Third, to create a healthy and challenging work environment for the employees." I paused.

"And fourth?" Byers said, raising his eyebrows.

I couldn't think of a final point. I glanced around and noticed a plate of sandwiches and cookies left over from their working lunch. "To never pay for a meal for four years."

He laughed. "Have some. We're a full-service venture capital firm."

"Thanks." I picked up a cookie.

Then they took a break. Several people scrambled for control of the conference room telephone. The losers bolted out the door in search of another line. John Doerr turned to me and said, "Good job. I'll talk this over with the partners and let you know where we stand."

I thanked him, recovered my portfolio from two associates who were inspecting it closely, and left.

On my next visit to Cambridge, to do some final consulting work on Lotus Agenda, I was abruptly awakened by the phone in my hotel room. It was John Doerr. How he tracked me down I don't know, but it was all the more strange because of the time difference—he was calling from San Francisco at four-thirty in the morning. Before I could get my bearings, John got down to business. "On behalf of the partnership, I'm pleased to tell you that we've decided to back you."

Now I was totally confused. I hadn't given him a business plan yet, nor asked him directly for any money. "John, I'm very happy to hear it, but don't you want to see some financial projections?"

"We're backing you and the idea." That seemed pretty straightforward, but at that hour of the morning, I'm never quite sure of things no matter how obvious they seem.

"We should get together right away to close the deal," John said. "When will you be back?"

"I'll be leaving for San Francisco tonight."

"Too bad, that's a problem. I'm leaving for New York first thing in the morning."

"When will you be returning to San Francisco?" I asked.

"Not for a week, and that's too long."

I didn't know John well at that point. He was a slender man with thin, sandy hair and a deep voice. He often wore khaki pants and a white button-down shirt, and always lugged around several canvas bags full of papers and electronic gadgets. When excited about an idea—which was most of the time —he would jump up and pace around like a whippet in a cage. I had never before known anyone so passionately committed to devoting every ounce of energy to his life's work. Once he had set a course of action, he pursued it with the intensity of a laser and the impatience of a speed freak. His style was

to cut through problems with dramatic solutions of grand proportions, as I was about to discover.

"What airline are you on?" he asked.

"TWA."

"OK, they have a hub in St. Louis. I've got an 'OAG' here, just a minute." He was referring to the pocket-sized "Official Airline Guide," a standard accessory for executives with a heavy travel schedule. "Change your flight to the nine A.M. tomorrow from Logan. That will arrive in St. Louis around ten fifty-five. There's a flight to San Francisco at twelve. That will give us an hour. I'll arrange a connection through there as well, and meet you at the gate."

"Will do," I said.

The next morning, I was just starting to perk up as the flight pulled into the gate in St. Louis. As promised, John was there to meet me. We soon agreed on a deal: the backers would get 33 percent of the company in Series A preferred stock in return for $1.5 million, which would be split among Kleiner Perkins, Mitchell Kapor, and a few smaller individual investors including Vinod Khosla, who had taken a keen interest in the project. John would be chairman of the board, I would be CEO. The board of directors would consist of John, Mitchell, Vinod, and me. Of the remaining equity, I would personally get 25 percent, and two other people—a VP of software and a VP of hardware, who were not yet identified—would each get one third of that amount (8.3 percent). The rest would be reserved for future employees.

With the business settled, we headed back to the gate for my flight.

"What do you want to call the company?" John asked.

I thought for a moment. ON was taken—Mitchell and Peter Miller were talking about some other ideas and were likely to use this name for whatever they decided to do. My second choice had been GO.

"GO, all caps," I said. "As in GO forth, GO for it, GO for the gold."

"As in GO public," John added.

When I boarded the noon flight, I realized that when the deal closed, the idea was worth $3 million (the total valuation of the company minus the invested cash), more than $1 million of which was mine —if I could ever convert that value into cash. And, of course, the investors were counting on its being worth a lot more.

Having assembled the idea and the money, the missing resource was people. I knew two engineers who I thought might be suitable and interested. One was Robert Carr, the bookish, articulate chief scientist of Ashton-Tate, which was then the third-largest PC software company (after Lotus and Microsoft). The other person was Kevin Doren, a brilliant and practical hardware designer whom I had worked with several years earlier, on a project to develop the first all-digital keyboard music synthesizer, before he founded his own company in Miami.

I called Robert and made an appointment to meet him for lunch at a small bistro in the western part of San Francisco. I had met him only once before, and didn't quite remember what he looked like: young, a bit short and muscular, with brown hair and eyes. He resembled an earnest high school honor student who went out for middleweight wrestling. What I did remember was how hard he was to read. You could never tell what he was thinking by looking at him.

We picked a table in the back of an outdoor courtyard, surrounded by concrete and shrubbery. As soon as we ordered, the coastal fog began to roll in and the temperature dropped precipitously, providing us some privacy when the damp chill drove most of the other diners indoors. We buttoned up our jackets and I explained the concept once again. Repeating the act that had worked at Kleiner Perkins, I brought the same leather portfolio and used it as a prop. Robert was strangely quiet during my presentation, mostly looking down at the case. His brown eyes stared through his round wire-

frame glasses as I explained the technical challenges and the business opportunity. As I finished up my pitch, I was consumed by curiosity.

"Any questions?"

He sat there silently, staring at my portfolio.

I waited, becoming impatient with his unresponsiveness. Finally I asked, "So, what do you think? Any chance you might want to do this?"

He slowly looked up, and I saw that his eyes were watery. I had mistaken his silence for lack of interest, when in fact he was struggling to keep his feelings in check. He was experiencing the same epiphany that had overcome Mitchell and me on that first flight.

Then he spoke. "Jerry, it's not a question of *whether* I want to do this. I *have* to do this. This is important. This is profound." He picked up the portfolio and lofted it up and down for emphasis. "You know, I'm happy at Ashton-Tate, but it's not very often that opportunities like this come along—something really big, a chance to really make a difference. Maybe once a decade or so. I think you've got one here."

"Robert, we're going to get one chance to make a point, that pen computers are a better way to manage information. If we succeed, we can change the way people work and think. If we fail, people will be lugging around keyboards from now until eternity. It's risky, but we have a shot at the brass ring."

He shook my hand and left. I felt close to him, despite our short time together. We had managed to share a very private moment. It took a lot of courage to do what he did—immediately choose to disrupt his life, quit his job, accept a position as a vice president when he had once run his own company, before selling it to Ashton-Tate. I knew right then that he was a class act, the sort of person I could rely on under pressure—a trait that would be severely tested over the coming years.

Recruiting Kevin Doren proved a somewhat more complex task. He was, after all, a cofounder of his company, lived across the country, and had recently been married. After several lengthy phone conversations, it was clear that he was interested. Persuading him was the easy part; his wife, Melanie, proved considerably more difficult.

From the outset, it was obvious that she didn't like this prospect at all. A Virginia girl in her mid-twenties, Melanie had become accustomed to Miami weather and didn't want to move so far away from her family. Kevin's strategy for dealing with her was to exhibit a high degree of patience. I followed his lead.

When she first entered my condominium on crooked Lombard Street atop Russian Hill, my fifteen-year-old cat Critter lumbered over to rub up against her. He was colored black and white in a bovine pattern, which meant that he could shed on anything and have it show. To entertain myself, I would occasionally take a black marker and alter his patterns.

"I'm not terribly fond of cats . . ." Melanie said as she sized him up. "Besides, I think he looks a bit sick."

In fact he was. His kidneys were failing, making him underweight and unsteady. I didn't expect him to last much longer.

"I hope he doesn't die while I'm here," she said.

Critter seemed to respond to this remark by staring disapprovingly into Melanie's eyes.

We spent several days driving all over town, looking at places to live—apartments, townhouses, walkups, tract houses, whatever we could find that might spark her interest. Kevin, a lanky man with large nose and straight brown hair, was shoehorned into the back seat of my compact yellow station wagon. By the end of the second day, Kevin and I had become expert in the neighborhoods of San Francisco and the surrounding areas, having visited virtually all of them. Melanie was paying less

attention to matters of geography, and after we ran out of new places to see, we discovered that we could take her back to the same ones again and get a somewhat different reaction. Little by little, Kevin softened her opposition. Maybe they didn't need a big back yard; maybe it would be easier for her to make friends if they lived in town; maybe they didn't need immediate access to a swimming pool.

On the third night, I unexpectedly had one of the most difficult experiences of my life. At about three A.M., Critter crept out of the closet where he normally slept and intentionally woke me up, which he had never done before. I opened my eyes and saw his thin, whiskered face right in front of mine. Then he went over to a particular sheltered spot under my platform bed and lay down. I got on my hands and knees to see what was under there, thinking it might be a dead mouse or some other feline treasure. He put his paw on one of my fingers, closed his eyes, and began a labored, steady pattern of deep breathing. At first he would slowly open his eyes if I called his name, but soon he appeared to be unaware of my presence. After several minutes he would abruptly stop breathing, then convulse as though slapped on the back, and begin again, like the engine of an old car that stalled, backfired, then turned over a few more times after the ignition had been turned off. Eventually he stopped altogether, and the skin on his face pulled back into a kind of grimace.

No one close to me had ever died before, much less in such a dramatic fashion. On television, people would be snagged by a bullet, then clutch their chest and collapse in a heap, but there was always a clear demarcation between being alive and being dead. This was different. The cat simply wound down, like a mechanical clock whose key was lost. To my immense surprise, I was devastated. I felt helpless and utterly alone. For a long time, home for me had been defined by where the cat was. From now on, I thought, I might as well be living in a hotel.

I felt all the worse for the cat's last act of kindness. The reason that cats seem more at peace with themselves than human beings do is that they know when they are going to die. What drives people crazy is not the fact that they will die, but that they don't know when it will happen. Furthermore, a cat's instinct when its time is up is to run away, find a quiet spot, and die alone, probably to avoid spoiling the communal den for their brethren. For some reason—perhaps the mountain of Tender Vittles I fed him over the years, perhaps those chilly days when I would let him stay warm in my lap as I worked—he decided to share his final moments with me.

When Melanie emerged from the guest room in the early morning, she immediately sensed a problem.

"Where's the cat?"

"He's gone." I wasn't interested in discussing it with her.

"For good?"

"Yep."

She walked over and awkwardly put her arm around me. "I'm so sorry," she said.

"Thanks. Sorry it had to happen while you were here."

"I know what it's like to lose someone close to you. But just remember, eventually you will feel better."

This opportunity to set aside her own concerns and connect with me somehow won her over. She soon acceded to Kevin's wishes and supported his taking the new job.

Eager to get started, Kevin stayed with me while Melanie returned to Miami to arrange for the move. We got together for our first working session on a bright fall morning in my condo. Because the hill was so steep, the condo layout was strictly Alice in Wonderland: parking on the top level right next to the living room, a spiral staircase down to three bedrooms, a formal entry yet one more floor below. Robert arrived with characteristic punctuality, banging loudly on the garage door, not realizing we

were sitting only a few steps away.

"Nice weather," I said as I opened the door.

"Cut the small talk, let's get down to work," Robert said in mock seriousness. He was poking fun a my own urgency to begin, even before Kevin had had time to move. As a peace offering, Robert extended a hand holding a waxed paper bag of bagels and cream cheese.

"Great, let's eat," I said as Kevin peered into the bag.

I pulled an open package of bacon out of the fridge and laid the five remaining strips on a paper towel in the microwave. "Who wants bacon?"

Kevin, always the engineer, began considering how we could divide five pieces fairly among three people.

"I know," said Robert. "That's three for Jerry and one for each of us." Kevin and I looked at each other quizzically, until we understood that Robert was referring to the founders' equity split: 3–1–1. We dived right into the discussion.

"I've done some research on components," Kevin said as he rifled through his overstuffed briefcas finally pulling out some dog-eared papers. Robert and I had already concluded that Kevin was not the most organized person, but when it came to wild ideas, he was willing to consider anything. He smoothed out some hand drawings on the table depicting a flat, nine-by-eleven-inch tablet, perhaps a inch thick, with no distinguishing features other than a screen and a single on-off button.

"We have a balancing act to do," he continued. "Weight, battery life, screen size, and memory are all intimately related. The larger the screen, or the more memory, the more power is required. Which means more battery, which translates to either more weight or shorter life. You can take your pick."

"Well, let's look at some options," Robert said.

"I figure we can bring the product in at about four pounds, with one pound each for the display, battery, circuit board, and case."

Robert began stuffing everything in sight into my maroon portfolio, which was sitting on the table in order to bring it up to four pounds. "Got a scale, Jerry?" he asked.

"In the bathroom, follow me." I stood and bounded down the narrow spiral staircase, which vibrate loudly. Robert and Kevin were close on my heels. We stopped abruptly and stared at the scale, realizing that it wasn't going to give a reading for something that light.

Kevin stepped on the scale and read his own weight. "Now give me the case." He took a second reading, dropping out pages until the scale read precisely four pounds more, then handed the portfolio to Robert.

Robert hefted it. "Feels heavy. I don't know if people will want to lug this much around."

"Look, the lightest laptop is about seven pounds, so I think this is pretty damn good," Kevin said, taking the matter personally. Then he turned the tables on Robert. "Anyway, it's the software that weighs the thing down."

"Huh? How's that possible?" Robert knew that software is the essence of intangibility. It is a pure expression of thought, like poetry and music, with no discernible physical form.

Kevin pointed his finger in the air, as though about to recite a passage from the Bible. "Software takes memory, and memory takes power." He glanced at Robert with eyebrows raised.

"Cost is the other problem," Kevin continued. "SRAM is expensive, about six hundred dollars a megabyte today. But I'm willing to bet that it will drop to around a hundred fifty bucks by the end of next year. So we can build the product for about a thousand dollars if we keep it to two megs. If it stays at six hundred bucks, or God forbid it goes up, we're hosed."

In contrast to software people like Robert, who are artists and craftsmen, hardware people are tinkerers and gamblers. Their challenge is to assemble things out of standard manufactured parts, as reliably and cheaply as possible. The problem is that these parts are constantly changing—in

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