Magazine

And Then Steve Said, 'Let There Be an iP

By FRED VOGELSTEIN OCT. 4, 2013

The 55 miles from Campbell to San Francisco make for one of the nicest commutes anywhere. The journey mostly zips along the Junipero Serra Freeway, a grand and remarkably empty highway that abuts the east side of the Santa Cruz Mountains. It is one of the best places in Silicon Valley to spot a start-up tycoon speed-testing his Ferrari and one of the worst places for cellphone reception. For Andy Grignon, it was therefore the perfect place for him to be alone with his thoughts early on Jan. 8, 2007.

This wasn't Grignon's typical route to work. He was a senior engineer at Apple in Cupertino, the town just west of Campbell. His morning drive typically covered seven miles and took exactly 15 minutes. But today was different. He was going to watch his boss, Steve Jobs, make history at the Macworld trade show in San Francisco. Apple fans had for years begged Jobs to put a cellphone inside their iPods so they could stop carrying two devices in their pockets. Jobs was about to fulfill that wish. Grignon and some colleagues would spend the night at a nearby hotel, and around 10 a.m. the following day they — along with the rest of the world — would watch Jobs unveil the first iPhone.

But as Grignon drove north, he didn't feel excited. He felt terrified. Most onstage product demonstrations in Silicon Valley are canned. The thinking goes, why let bad Internet or cellphone connections ruin an otherwise good presentation? But Jobs insisted on live presentations. It was one of the things that made them so captivating. Part of his legend was that noticeable product-demo glitches almost never happened. But for those in the background, like Grignon, few parts of the job caused more stress.

Grignon was the senior manager in charge of all the radios in the iPhone. This is a big job. Cellphones do innumerable useful things for us today, but

the phone to be a phone. If the device didn't make calls, or didn't connect with Bluetooth headsets or Wi-Fi setups, Grignon had to answer for it. As one of the iPhone's earliest engineers, he'd dedicated two and a half years of his life — often seven days a week — to the project.

Grignon had been part of the iPhone rehearsal team at Apple and later at the presentation site in San Francisco's Moscone Center. He had rarely seen Jobs make it all the way through his 90-minute show without a glitch. Jobs had been practicing for five days, yet even on the last day of rehearsals the iPhone was still randomly dropping calls, losing its Internet connection, freezing or simply shutting down.

'Let There Be an iP
Illustration by Matt Do

"At first it was just really cool to be at rehearsals at all — kind of like a cred badge," Grignon says. Only a chosen few were allowed to attend. "But it quickly got really uncomfortable. Very rarely did I see him become completely unglued — it happened, but mostly he just looked at you and very directly said in a very loud and stern voice, 'You are [expletive] up my company,' or, 'If we fail, it will be because of you.' He was just very intense. And you would always feel an inch tall." Grignon, like everyone else at rehearsals, knew that if those glitches showed up during the real presentation, Jobs would not be blaming himself for the problems. "It felt like we'd gone through the demo a hundred times, and each time something went wrong," Grignon says. "It wasn't a good feeling."

The preparations were top-secret. From Thursday through the end of the following week, Apple completely took over Moscone. Backstage, it built an eight-by-eight-foot electronics lab to house and test the iPhones. Next to that it built a greenroom with a sofa for Jobs. Then it posted more than a dozen security guards 24 hours a day in front of those rooms and at doors throughout the building. No one got in without having his or her ID electronically checked and compared with a master list that Jobs had personally approved. The auditorium where Jobs was rehearsing was off limits to all but a small group of executives. Jobs was so obsessed with leaks that he tried to have all the contractors Apple hired — from people

building the night before his presentation. Aides talked him out of it.

Grignon knew the iPhone unveiling was not an ordinary product announcement, but no one could have anticipated what a seminal moment it would become. In the span of seven years, the iPhone and its iPad progeny have become among the most important innovations in Silicon Valley's history. They transformed the stodgy cellphone industry. They provided a platform for a new and hugely profitable software industry — mobile apps, which have generated more than $10 billion in revenue since they began selling in 2008. And they have upended the multibillion-dollar personal-computer industry. If you include iPad sales with those for desktops and laptops, Apple is now the largest P.C. maker in the world. Around 200 million iPhones and iPads were sold last year, or more than twice the number of cars sold worldwide.

The impact has been not only economic but also cultural. Apple's innovations have set off an entire rethinking of how humans interact with machines. It's not simply that we use our fingers now instead of a mouse. Smartphones, in particular, have become extensions of our brains. They have fundamentally changed the way people receive and process information. Ponder the individual impacts of the book, the newspaper, the telephone, the radio, the tape recorder, the camera, the video camera, the compass, the television, the VCR and the DVD, the personal computer, the cellphone, the video game and the iPod. The smartphone is all those things, and it fits in your pocket. Its technology is changing the way we learn in school, the way doctors treat patients, the way we travel and explore. Entertainment and media are accessed and experienced in entirely new ways.

And yet Apple today is under siege. From the moment in late 2007 that Google unveiled Android — and its own plan to dominate the world of mobile phones and other mobile devices — Google hasn't just tried to compete with the iPhone; it has *succeeded* in competing with the iPhone. Android has exploded in popularity since it took hold in 2010. Its share of the global smartphone market is approaching 80 percent, while Apple's has

percent of the tablets sold run Android.

What worries Apple fans most of all is not knowing where the company is headed. When Jobs died in October 2011, the prevailing question wasn't whether Tim Cook could succeed him, but whether *anyone* could. When Jobs ran Apple, the company was an innovation machine, churning out revolutionary products every three to five years. He told his biographer, Walter Isaacson, that he had another breakthrough coming — a revolution in TV. But under Cook, nothing has materialized, and the lack of confidence among investors is palpable. When Cook presented the latest smartphones in September, the iPhone 5c and the iPhone 5s, Apple's stock *fell* 10 percent. A year ago the company's stock price was at $702 a share, making Apple the world's most valuable corporation. Today, it's down more than 25 percent from that peak.

Comparing anyone with Steve Jobs is unfair. And during his two years as Apple's chief executive, Cook has taken pains to point out that Jobs himself made it clear to him that he didn't want Cook running Apple the way he thought Jobs would want to, but the way Cook thought it should be done. It hardly needed to be said. When you look back at how the iPhone came to be, it's clear that it had everything to do with the unreasonable demands — and unusual power — of an inimitable man.

It's hard to overstate the gamble Jobs took when he decided to unveil the iPhone back in January 2007. Not only was he introducing a new kind of phone — something Apple had never made before — he was doing so with a prototype that barely worked. Even though the iPhone wouldn't go on sale for another six months, he wanted the world to want one right then. In truth, the list of things that still needed to be done was enormous. A production line had yet to be set up. Only about a hundred iPhones even existed, all of them of varying quality. Some had noticeable gaps between the screen and the plastic edge; others had scuff marks on the screen. And the software that ran the phone was full of bugs.

The iPhone could play a section of a song or a video, but it couldn't play an entire clip reliably without crashing. It worked fine if you sent an e-mail and then surfed the Web. If you did those things in reverse, however, it might not. Hours of trial and error had helped the iPhone team develop what engineers called "the golden path," a specific set of tasks, performed in a specific way and order, that made the phone look as if it worked.

But even when Jobs stayed on the golden path, all manner of last-minute

So, too, did the software that managed the iPhone's memory. And no one knew whether the extra electronics Jobs demanded the demo phones include would make these problems worse.

Jobs wanted the demo phones he would use onstage to have their screens mirrored on the big screen behind him. To show a gadget on a big screen, most companies just point a video camera at it, but that was unacceptable to Jobs. The audience would see his finger on the iPhone screen, which would mar the look of his presentation. So he had Apple engineers spend weeks fitting extra circuit boards and video cables onto the backs of the iPhones he would have onstage. The video cables were then connected to the projector, so that when Jobs touched the iPhone's calendar app icon, for example, his finger wouldn't appear, but the image on the big screen would respond to his finger's commands. The effect was magical. People in the audience felt as if they were holding an iPhone in their own hands. But making the setup work flawlessly, given the iPhone's other major problems, seemed hard to justify at the time.

The software in the iPhone's Wi-Fi radio was so unstable that Grignon and his team had to extend the phones' antennas by connecting them to wires running offstage so the wireless signal wouldn't have to travel as far. And audience members had to be prevented from getting on the frequency being used. "Even if the base station's ID was hidden" — that is, not showing up when laptops scanned for Wi-Fi signals — "you had 5,000 nerds in the audience," Grignon says. "They would have figured out how to hack into the signal." The solution, he says, was to tweak the AirPort software so that it seemed to be operating in Japan instead of the United States. Japanese Wi-Fi uses some frequencies that are not permitted in the U.S.

There was less they could do to make sure the phone calls Jobs planned to make from the stage went through. Grignon and his team could only ensure a good signal, and then pray. They had AT&T, the iPhone's wireless carrier, bring in a portable cell tower, so they knew reception would be strong. Then, with Jobs's approval, they preprogrammed the phone's display to always show five bars of signal strength regardless of its true strength. The chances of the radio's crashing during the few minutes that Jobs would use it to make a call were small, but the chances of its crashing at some point during the 90-minute presentation were high. "If the radio crashed and restarted, as we suspected it might, we didn't want people in the audience to see that," Grignon says. "So we just hard-coded it to always show five bars."

tasks at a time. Jobs had a number of demo units onstage with him to manage this problem. If memory ran low on one, he would switch to another while the first was restarted. But given how many demos Jobs planned, Grignon worried that there were far too many potential points of failure. If disaster didn't strike during one of the dozen demos, it was sure to happen during the grand finale, when Jobs planned to show all the iPhone's top features operating at the same time on the same phone. He'd play some music, take a call, put it on hold and take another call, find and e-mail a photo to the second caller, look up something on the Internet for the first caller and then return to his music. "Me and my guys were all so nervous about this," Grignon says. "We only had 128 megabytes of memory in those phones" — maybe the equivalent of two dozen large digital photographs — "and because they weren't finished, all these apps were still big and bloated."

Jobs rarely backed himself into corners like this. He was well known as a taskmaster, seeming to know just how hard he could push his staff so that it delivered the impossible. But he always had a backup, a Plan B, that he could go to if his timetable was off.

But the iPhone was the only cool new thing Apple was working on. The iPhone had been such an all-encompassing project at Apple that this time there *was* no backup plan. "It was Apple TV or the iPhone," Grignon says. "And if he had gone to Macworld with just Apple TV" — a new product that connected iTunes to a television set — "the world would have said, 'What the heck was that?' "

The idea that one of the biggest moments of his career might implode made Grignon's stomach hurt. By 2007 he'd spent virtually his entire career at Apple or companies affiliated with it. While at the University of Iowa in 1993, he and his friend Jeremy Wyld reprogrammed the Newton MessagePad to wirelessly connect to the Internet. Even though the Newton would not succeed as a product, many still regard it as the first mainstream hand-held computer, and their hack was quite a feat back then; it helped them both get jobs at Apple. Wyld ended up on the Newton team, while Grignon worked in Apple's famous R. & D. lab — the Advanced Technology Group — on videoconferencing technology.

By 2000 Grignon had found his way to Pixo, a company started by a former Apple software developer that was building operating systems for cellphones and other small devices. When Pixo's software ended up in the first iPod in 2001, Grignon found himself back at Apple again.

transmitters (Wi-Fi and Bluetooth) and the workings of software inside small hand-held devices like cellphones. Grignon moves in an entirely different world from that inhabited by most software engineers in the valley. Most rarely have to think about whether their code takes up too much space on a hard drive or overloads a chip's abilities. Hardware on desktop and laptop computers is powerful, modifiable and cheap; memory, hard drives and even processors can be upgraded inexpensively; and computers are either connected to electrical outlets or giant batteries. In Grignon's area of embedded software, the hardware is fixed. Code that is too big won't run. Meanwhile, a tiny battery — which might power a laptop for a couple of minutes — needs enough juice to last all day. When work on the iPhone began at the end of 2004, Grignon had a perfect set of skills to become one of the early engineers on the project.

Now, in 2007, he was emotionally exhausted. He'd gained 50 pounds. He'd put stress on his marriage. The iPhone team discovered early on that making a phone didn't resemble building computers or iPods at all. "It was very dramatic," Grignon says. "It had been drilled into everyone's head that this was the next big thing to come out of Apple. So you put all these supersmart people with huge egos into very tight, confined quarters, with that kind of pressure, and crazy stuff starts to happen."

Remarkably, Jobs had to be talked into having Apple build a phone at all. It had been a topic of conversation among his inner circle almost from the moment Apple introduced the iPod in 2001. The conceptual reasoning was obvious: consumers would rather not carry two or three devices for e-mail, phone calls and music if they could carry one. But every time Jobs and his executives examined the idea in detail, it seemed like a suicide mission. Phone chips and bandwidth were too slow for anyone to want to surf the Internet and download music or video over a cellphone connection. E-mail was a fine function to add to a phone, but Research in Motion's BlackBerry was fast locking up that market.

Above all, Jobs didn't want to partner with any of the wireless carriers. Back then the carriers expected to dominate any partnership with a phone maker, and because they controlled the network, they got their way. Jobs, a famed control freak, couldn't imagine doing their bidding. Apple considered buying Motorola in 2003, but executives quickly concluded it would be too big an acquisition for the company then. (The two companies collaborated unsuccessfully a couple of years later.)

But by the fall of 2004, doing business with the carriers was starting to

Apple could become its own wireless carrier — what's known as a "mobile virtual network operator." Apple could build a phone and barely have to deal with the carriers at all. Disney, on whose board Jobs sat, was already in discussions with Sprint about just such a deal to provide its own wireless service. Jobs was asking a lot of questions about whether Apple should pursue one as well. The deal Apple ultimately signed with Cingular (later acquired by AT&T) in 2006 took more than a year to hammer out, but it would prove easy compared to what Apple went through just to build the device.

Many executives and engineers, riding high from their success with the iPod, assumed a phone would be like building a small Macintosh. Instead, Apple designed and built not one but three different early versions of the iPhone in 2005 and 2006. One person who worked on the project thinks Apple then made six fully working prototypes of the device it ultimately sold — each with its own set of hardware, software and design tweaks. Some on the team ended up so burned out that they left the company shortly after the first phone hit store shelves. "It was like the first moon mission," says Tony Fadell, a key executive on the project. (He started his own company, Nest, in 2010.) "I'm used to a certain level of unknowns in a project, but there were so many new things here that it was just staggering."

Jobs wanted the iPhone to run a modified version of OS X, the software that comes with every Mac. But no one had ever put a gigantic program like OS X on a phone chip before. The software would have to be a tenth its usual size. Millions of lines of code would have to be stripped out or rewritten, and engineers would have to simulate chip speed and battery drain because actual chips weren't available until 2006.

No one had ever put a multitouch screen in a mainstream consumer product before, either. Capacitive touch technology — a "touch" by either a finger or other conductive object completes a circuit — had been around since the 1960s. Capacitive *multitouch*, in which two or more fingers can be used and independently recognized, was vastly more complicated. Research into it began in the mid-1980s. It was well known, though, that to build the touch-screen Apple put on the iPhone and produce it in volume was a challenge few had the money or guts to take on. The next steps — to embed the technology invisibly in a piece of glass, to make it smart enough to display a virtual keyboard with autocorrect and to make it sophisticated enough to reliably manipulate photos or Web pages on that screen — made it hugely expensive even to produce a working prototype. Few production

users pushed with a finger or a stylus. (The PalmPilot and its successors like the Palm Treo were popular expressions of this technology.) Even if multitouch iPhone screens had been easy to make, it wasn't at all clear to Apple's executive team that the features they enabled, like on-screen keyboards and "tap to zoom," were enhancements that consumers wanted.

As early as 2003, a handful of Apple engineers had figured out how to put multitouch technology in a tablet. "The story was that Steve wanted a device that he could use to read e-mail while on the toilet — that was the extent of the product spec," says Joshua Strickon, one of the earliest engineers on that project. "But you couldn't build a device with enough battery life to take out of the house, and you couldn't get a chip with enough graphics capability to make it useful. We spent a lot of time trying to figure out just what to do." Before joining Apple in 2003, Strickon had built a multitouch device for his master's thesis at M.I.T. But given the lack of consensus at Apple about what to do with the prototypes he and his fellow engineers developed, he says, he left the company in 2004 thinking it wasn't going to do anything with that technology.

Tim Bucher, one of Apple's top executives at the time and the company's biggest multitouch proponent, says part of the problem was that the prototypes they were building used software, OS X, that was designed to be used with a mouse, not a finger. "We were using 10- or 12-inch screens with Mac-mini-like guts . . . and then you would launch these demos that would do the different multitouch gestures. One demo was a keyboard application that would rise from the bottom — very much what ended up shipping in the iPhone two years later. But it wasn't very pretty. It was very much wires, chewing gum and baling wire."

Few even thought about making touch-screen technology the centerpiece of a new kind of phone until Jobs started really pushing the idea in mid-2005. "He said: 'Tony, come over here. Here's something we're working on. What do you think? Do you think we could make a phone out of this?' " Fadell says, referring to a demo Jobs was playing with. "It was huge. It filled the room. There was a projector mounted on the ceiling, and it would project the Mac screen onto this surface that was maybe three or four feet square. Then you could touch the Mac screen and move things around and draw on it." Fadell was aware of the touch-screen prototype, but not in great detail, because it was a Mac product, and he ran the iPod division. "So we all sat down and had a serious discussion about it — about what could be done."

Fadell had strong doubts about shrinking such an enormous prototype so

2001 as a consultant to help build the first iPod, and he didn't get there by being timid in the face of thorny technological problems. By 2005, with iPod sales exploding, he had become, at 36, arguably the single most important line executive at the company.

"I understood how it could be done," Fadell says. "But it's one thing to think that, and another to take a room full of special, one-off gear and make a million phone-size versions of that in a cost-effective, reliable manner." The to-do list was exhausting just to think about. "You had to go to LCD vendors who knew how to embed technology like this in glass; you had to find time on their line; and then you had to come up with compensation and calibrating algorithms to keep the pixel electronics from generating all kinds of noise in the touch-screen" — which sat on top of the LCD. "It was a whole project just to make the touch-screen device. We tried two or three ways of actually making the touch-screen until we could make one in enough volume that would work."

Shrinking OS X and building a multitouch screen, while innovative and difficult, were at least within the skills Apple had already mastered as a corporation. No one was better equipped to rethink OS X's design. Apple knew LCD manufacturers because it put an LCD in every laptop and iPod. Mobile-phone physics was an entirely new field, however, and it took those working on the iPhone into 2006 to realize how little they knew. Apple built testing rooms and equipment to test the iPhone's antenna. It created models of human heads, with viscous stuff inside to approximate the density of human brains, to help measure the radiation that users might be exposed to from using the phone. One senior executive believes that more than $150 million was spent creating the first iPhone.

From the start of the project, Jobs hoped that he would be able to develop a touch-screen iPhone running OS X similar to what he ended up unveiling. But in 2005 he had no idea how long that would take. So Apple's first iPhone looked very much like the joke slide Jobs put up when introducing the real iPhone — an iPod with an old-fashioned rotary dial on it. The prototype really was an iPod with a phone radio that used the iPod click wheel as a dialer. "It was an easy way to get to market, but it was not cool like the devices we have today," Grignon says.

The second iPhone prototype in early 2006 was much closer to what Jobs would ultimately introduce. It incorporated a touch-screen and OS X, but it was made entirely of brushed aluminum. Jobs and Jonathan Ive, Apple's design chief, were exceedingly proud of it. But because neither of them was

Caballero" — Apple's antenna expert — "had to go up to the boardroom and explain to Steve and Ive that you cannot put radio waves through metal," says Phil Kearney, an engineer who left Apple in 2008. "And it was not an easy explanation. Most of the designers are artists. The last science class they took was in eighth grade. But they have a lot of power at Apple. So they ask, 'Why can't we just make a little seam for the radio waves to escape through?' And you have to explain to them why you just can't."

Jon Rubinstein, Apple's top hardware executive at the time, says there were even long discussions about how big the phone would be. "I was actually pushing to do two sizes — to have a regular iPhone and an iPhone mini like we had with the iPod. I thought one could be a smartphone and one could be a dumber phone. But we never got any traction on the small one, and in order to do one of these projects, you really need to put all your wood behind one arrow."

The iPhone project was so complex that it occasionally threatened to derail the entire corporation. Many top engineers in the company were being sucked into the project, forcing slowdowns in the timetables of other work. Had the iPhone been a dud or not gotten off the ground at all, Apple would have had no other big products ready to announce for a long time. And worse, according to a top executive on the project, the company's leading engineers, frustrated by failure, would have left Apple.

Compounding all the technical challenges, Jobs's obsession with secrecy meant that even as they were exhausted by 80-hour workweeks, the few hundred engineers and designers working on the iPhone couldn't talk about it to anyone else. If Apple found out you'd told a friend in a bar, or even your spouse, you could be fired. In some cases, before a manager could ask you to join the project, you had to sign a nondisclosure agreement in his office. Then, after he told you what the project was, you had to sign another document confirming that you had indeed signed the NDA and would tell no one. "We put a sign on over the front door of the purple dorm" — the iPhone building — "that said 'fight club,' because the first rule of fight club is you don't talk about fight club," Scott Forstall, Apple's senior vice president of iOS software until last October, testified in 2012 during the Apple v. Samsung trial. "Steve didn't want to hire anyone from outside of Apple to work on the user interface, but he told me I could hire anyone in the company," Forstall said. "So I'd bring them into my office, sit them down and tell them: 'You are a superstar in your current role. I have another project that I want you to consider. I can't tell you what it is. All I can say is that you will have to give up nights and weekends and

One of the early iPhone engineers says, "My favorite part was what all the vendors said the day after the unveiling." Big companies like Marvell, which made the Wi-Fi radio chip, and CSR, which provided the Bluetooth radio chip, hadn't been told they were going to be in a new phone. They thought they were going to be in a new iPod. "We actually had fake schematics and fake industrial designs," the engineer says. Grignon says that Apple even went as far as to impersonate employees of another company when they traveled, especially to Cingular. "The whole thing was you didn't want the receptionist or whoever happens to be walking by to see all the badges lying out" with Apple's name on them.

One of the most obvious manifestations of Jobs's obsession with secrecy were the locked-down areas on the company's campus — places that those not working on the iPhone could no longer go. "Steve loved this stuff," Grignon says. "He loved to set up division. But it was a big '[expletive] you' to the people who couldn't get in. Everyone knows who the rock stars are in a company, and when you start to see them all slowly get plucked out of your area and put in a big room behind glass doors that you don't have access to, it feels bad."

Even people within the project itself couldn't talk to one another. Engineers designing the electronics weren't allowed to see the software. When they needed software to test the electronics, they were given proxy code, not the real thing. If you were working on the software, you used a simulator to test hardware performance.

And no one outside Jobs's inner circle was allowed into Jonathan Ive's wing on the first floor of Building 2. The security surrounding Ive's prototypes was so tight that some employees believed the badge reader called security if you tried to enter and weren't authorized. "It was weird, because it wasn't like you could avoid going by it. It was right off the lobby, behind a big metal door. Every now and then you'd see the door open and you'd try to look in and see, but you never tried to do more than that," says an engineer whose first job out of college was working on the iPhone. Forstall said during his testimony that some labs required you to "badge in" four times.

The pressure to meet Jobs's deadlines was so intense that normal discussions quickly devolved into shouting matches. Exhausted engineers quit their jobs — then came back to work a few days later once they had slept a little. Forstall's chief of staff, Kim Vorrath, once slammed her office door so hard it got stuck and locked her in, and co-workers took more than

step back and realize how [expletive] it all is."

When Jobs started talking about the iPhone on Jan. 9, 2007, he said, "This is a day I have been looking forward to for two and a half years." Then he regaled the audience with myriad tales about why consumers hated their cellphones. Then he solved all their problems — definitively.

As Grignon and others from Apple sat nervously in the audience, Jobs had the iPhone play some music and a movie clip to show off the phone's beautiful screen. He made a phone call to show off the phone's reinvented address book and voice mail. He sent a text and an e-mail, showing how easy it was to type on the phone's touch-screen keyboard. He scrolled through a bunch of photos, showing how simple pinches and spreads of two fingers could make the pictures smaller or bigger. He navigated The New York Times's and Amazon's Web sites to show that the iPhone's Internet browser was as good as the one on his computer. He found a Starbucks with Google Maps — and called the number from the stage — to show how it was impossible to get lost with an iPhone.

By the end, Grignon wasn't just relieved; he was drunk. He'd brought a flask of Scotch to calm his nerves. "And so there we were in the fifth row or something — engineers, managers, all of us — doing shots of Scotch after every segment of the demo. There were about five or six of us, and after each piece of the demo, the person who was responsible for that portion did a shot. When the finale came — and it worked along with everything before it, we all just drained the flask. It was the best demo any of us had ever seen. And the rest of the day turned out to be just a [expletive] for the entire iPhone team. We just spent the entire rest of the day drinking in the city. It was just a mess, but it was great." ◆

Correction: October 20, 2013

An article on Oct. 6 about the development of the iPhone referred incorrectly to changes in Apple's stock price when Steve Jobs ran the company. The stock price would sometimes rise and sometimes fall after Apple product announcements. It is not the case that Apple product announcements routinely sent its stock soaring.

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