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ONE MORE THING

The iPhone

The logic that was driving device manufacturers to cram a kitchen sink's worth of technology into the singular form factor of the smartphone was simple. Why carry multiple devices around when you could just carry one? Why would you want a PDA *and* a messenger? You wouldn't. So, Palms gained messaging capabilities. Why would you want to carry a messenger *and* a cell phone? So, BlackBerrys gained the ability to make phone calls.

But what about that other device that, for about half a decade, was also taking up space in everyone's pockets? Clearly, if you could store music on your cell phone, you wouldn't need to carry around an MP3 player. And nobody was more aware of the cold logic of this than Apple.

"The iPod was selling. It was selling better and better. It was probably 50% of our sales [by the mid 2000s]," says Scott Forstall, a senior Apple executive at the time. "And so, we kept asking ourselves, 'What concerns do we have about the iPod's success, long-term? What will cannibalize iPod sales?' And, one of the biggest concerns was cell phones."[1]

Apple had a vested interest in preventing cell phones from eating its iPod/iTunes lunch. And, as the example of the iPod Nano supplanting the iPod Mini illustrated, Apple could be ruthless when it came to killing its darlings. At the same time, it can't be underestimated how much the success of the iPod changed Apple, altering not only what the company thought of itself, but also

changing the very notion of the type of business it could be.

Another Apple executive, Phil Schiller, said that the iPod completely changed Apple's opinion about its own raison d'être. "People started asking, 'Well, if you can have a big hit with the iPod, what else can you do?' And people were suggesting every idea—make a camera, make a car—crazy stuff."[2]

So, an iCamera? Maybe an iTelevision? Like MP3 players, these were standard, stand-alone consumer electronics products. You didn't need anyone's permission to sell devices like these to the masses. Apple could probably gin up the best damned camera anyone had made since George Eastman and potentially blow a whole new industry completely out of the water.

But a cell phone was an entirely different proposition, because it required working with the carriers that controlled the cellular networks in order to make a phone. The carriers decided which devices would be allowed on their networks. They decided the technology those devices could use. They even decided what type of features those devices could have. In short, the cell carriers dictated to the device manufacturers, with the end result being that, in spite of the explosion of features brought on by the smartphone revolution, innovation in the cell-phone space was actually incremental and bureaucratic.

Apple was not a company that liked bureaucracy. Furthermore, Steve Jobs had only recently dragged the music industry kicking and screaming into the twenty-first century. He didn't relish the prospect of having to cajole and educate another recalcitrant group of backward-thinking companies. At the All Things D conference in 2004, the venture capitalist Stewart Alsop Jr. virtually begged Apple to make a phone. Jobs demurred. "We've visited with the handset manufacturers and we've talked to the Treo guys [Palm]," Jobs said. "They tell us horror stories."[3] At the same conference the following year, Jobs outlined the problem, as he saw it. "The carriers now have gained the upper hand in terms of the power of the relationship with the handset manufacturers," Jobs said. He described how manufacturers would get thick books of product and network specs from the carriers, which essentially dictated everything a cell phone could be, down to the last screw and wire. That wasn't Apple's MO. "The problem with a phone is that we're not very good going through orifices [like the carriers] to get to the end users,"[4] Jobs said.

Still, the momentum of technologies converging into the singular device of the smartphone was hard to miss. And the poor state of the art when it came to cell phones was something of an irresistible challenge to a company that was feeling its oats and eager to solve big problems. "We looked around," said

Forstall, "And we noticed that almost everyone around us had phones. And everyone was complaining about their phones. And we thought, 'Could we build something better?' "[5]

Wary of working with the carriers directly, but looking to protect the iPod/iTunes franchise, Apple dipped its toe into the cellular waters by partnering with one of the existing handset makers, Motorola, in early 2004. Apple would merely license the iTunes software, while Motorola would design the hardware, and—most important—deal with the carriers. "We thought that if consumers chose to get a music phone instead of an iPod," remembered Tony Fadell, Apple's executive in charge of the iPod franchise, "at least they would be using iTunes."[6] Apple settled on working with Motorola because it dominated the handset business with its recent release, the RAZR flip phone. The RAZR was a "dumb" phone, not a smartphone, but it was thin, sexy, well designed. In short, it was the sort of product Apple was willing to associate itself with. The RAZR was a huge hit, selling 50 million units in just two years.[7] So, for its first, experimental foray into cell phones, Apple thought it would be injecting its software magic into one of the hottest devices around.

But instead of producing a music-enabled RAZR, Motorola ended up delivering the clunky ROKR. Motorola took eighteen months to deliver this candy bar–style device and it was fatally, almost ridiculously, flawed. It reeked of a handset that was designed by committee, something antithetical to everything Apple stood for. It could hold only one hundred songs, making it the most limited MP3 player Apple had a hand in producing. Within a month of going on sale, customers were returning the ROKR at six times the industry average for a cell phone.[8] *Wired* magazine asked of the ROKR, "You Call This the Phone of the Future?"[9]

"This is not gonna fly," Jobs told the iPod guru Fadell. "I'm sick and tired of dealing with bozo handset guys."[10]

The star-crossed ROKR had been developed in partnership with the wireless carrier Cingular (soon to become AT&T after a series of mergers). At the time, Cingular was struggling to compete with industry leader Verizon. While the ROKR was being developed, Cingular executives began to try to convince Steve Jobs to create an Apple phone exclusively for their network. At first, Jobs refused even to listen to Cingular's entreaties, instead toying with the idea of launching a stand-alone, Apple-branded cellular network. "Jobs hated the idea of a deal with us at first," Cingular executive Jim Ryan said. "Hated it."[11] But Ryan stressed to Jobs the headaches involved in becoming a carrier, not just a

hardware maker. Indeed, the customer service, logistical, technical and reliability issues of operating a nationwide cellular network were something Apple had zero experience with. "Funny as it sounds, that was one of our big selling points to [Apple]," Ryan recounted. "Every time the phone drops a call, you blame the carrier. Every time something good happens, you thank Apple."[12]

At the same time Cingular was trying to sell Jobs on the idea of making an Apple phone, a handful of Apple execs, especially Mike Bell and Steve Sakoman, were making the argument for an "iPhone" as well. Bell sent Jobs a long, thoughtful email on November 7, 2004, outlining all his arguments. "I said, 'Steve, I know you don't want to do a phone, but here's why we should do it." Jony Ive had some great iPod designs in the pipeline, Bell reported. All they had to do was pick one, throw some patented Apple software in it, add a cellular radio, and make their own phone. "He calls me back about an hour later and we talk for two hours, and he finally says, 'Okay, I think we should just do it.' "[13]

The deal Apple would cut with Cingular/AT&T would take a year to finalize, but it alleviated almost all of Jobs's concerns. In exchange for an exclusive right to an Apple phone on its network, AT&T would grant Jobs carte blanche to design the phone as Apple saw fit. It would be completely Apple-branded and AT&T would have no say in the features or services the phone offered. As icing on the cake, Apple would get a share of the monthly cellular data payments users would have to cough up to use the device.

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BY EARLY 2005, an iPhone was in development. In Cingular, Apple had a partner that would allow it to design a phone as Steve Jobs felt it should be done. But Apple still had zero experience designing a phone, so how the device would turn out in the end was entirely up in the air.

As Mike Bell suggested, the most logical thing to do was to simply add radios to existing iPods. iPods were beloved. Apple was already manufacturing them by the tens of millions. How hard could it be? In a high-level meeting, Jobs signed off on the plan, saying, "We're going to do this iPod-based thing, make that into a phone because that's a much more doable project. More predictable."[14]

The phone project gained the internal code name Purple. Early prototypes were patched together that were merely that: existing iPods, with attached cellular and WiFi radio antennas. But as straightforward as the concept was, iPod+phone simply didn't pan out in real-world use cases. The problem was that

the iPod's vaunted click wheel—while a brilliant user interface breakthrough when selecting songs from a list of albums—was not ideal for dialing a phone, much less inputting things like text messages. "We were having a lot of problems using the wheel. . . . It was cumbersome," Fadell told Walter Isaacson in his biography of Jobs.[15]

An Apple engineer named Andy Grignon was tasked with demoing one of the first iPod prototypes to include WiFi. To browse the web on the iPod's tiny screen, "You would click the wheel, you would scroll the web page, and you could click on it, and you could jump in," Grignon said. "And [Jobs] was like, 'This is bullshit.' He called it right away. . . . 'I don't want this. I know it works, I got it, great, thanks, but this is a shitty experience.' "[16]

Fortunately, there was another possible solution waiting in the wings. It just so happened to be an idea that Jobs had also dismissed—at least a first.

Back when Steve Jobs returned to Apple and saved the company from oblivion, he did so, in part, by drastically reducing Apple's focus to only a few core products and technologies. Apple engineers continued to work on skunkworks projects, but they were forced to do so on the down-low, lest Jobs learn of their efforts and shut them down. In the early 2000s, a cadre of Apple engineers was interested in exploring new computer interfaces beyond the typical keyboard or mouse. To stay off Jobs's radar, the engineers often met in Apple's abandoned user-testing lab. In the Steve Jobs era of Apple, focus groups and user testing were superfluous. Only one person (Jobs, of course) decided whether products were worth producing or not.

The secret group was focused on the future of traditional computing, not gadgetry. "Phones weren't even on the table then," says Joshua Strickon, one of the underground engineers. "They weren't even a topic of discussion."[17] The group was more interested in the sort of computer wizardry that had been shown off in the recent sci-fi film *Minority Report*. Gestural input, waving your hands around to manipulate data, *etc*. The group became fascinated with technology from a small Delaware technology company called FingerWorks. FingerWorks produced a plastic touchpad that allowed users to interact with data directly, in a manual, tactile way, using what was known as multitouch finger tracking.[18]

Someone brought in a Mac, set up a projector over a table and positioned the FingerWorks trackpad beneath it. Soon there was a table-sized demo that showed how a user could interact with a full computer operating system using just their hands. The group shared their demo with Jony Ive and the rest of Apple's industrial design team. Ive was more than impressed.

Dubbing the demo the "Jumbotron" since it was the size of a Ping-Pong table, he told the team to wait until the time was right to show it to Jobs. "Because Steve is so quick to give an opinion, I don't show him stuff in front of other people," Ive explained later. "He might say, 'This is shit,' and snuff the idea. I feel that ideas are very fragile, so you have to be tender when they are in development. I realized that if he pissed on this, it would be so sad, because I knew it was so important."[19]

Indeed, when Ive finally did demo the Jumbotron for Steve, in the summer of 2003, "he was completely underwhelmed," says Ive. "He didn't see that there was any value to the idea. And I felt really stupid because I had perceived it to be a very big thing."[20]

But every so often, ideas that Steve Jobs dismissed at first could grow on him over time. One day's stupid idea could become tomorrow's brilliant breakthrough. "As far as I know," says Brian Huppi, one of the engineers responsible for the Jumbotron, "Jony showed him the demo of multitouch and then it was clicking in his mind. . . . Steve does this, you know: He comes back later and it's *his* idea."[21]

The idea clicking in Steve's mind was the notion that somehow the multitouch technology could be used to solve the phone problem.

"I was sitting with Steve at lunch one time," remembered Scott Forstall. "And Steve said, 'Do you think we could take that demo we're doing with the tablet and multitouch, and shrink it down to something big enough—or small enough—to fit in your pocket?' "[22]

Work on the Jumbotron had continued in fits and starts, with the assumption that the end result might be some kind of tablet, what would eventually become the iPad. But in late 2004, the word came down from Jobs officially: "We're gonna do a phone. There's gonna be no buttons. Just a touchscreen."[23] Apple purchased FingerWorks for the multitouch technology, and soon the phone project was split into two competing tracks. P1 (shortening the Purple designation) became the code name for the existing iPod+Phone version. P2 became this new, multitouch, shrunk-down tablet idea.

In order to make either version work, Apple would need to design the software as well as the hardware. Forstall, who had worked on the Mac's OS X operating system, was put in charge of software development. With Jobs's famous obsession with secrecy, Forstall was told he couldn't hire anyone from outside the company to work on his part of the project; but he was nonetheless free to pick liberally from internal talent. Forstall didn't tell recruits what,

exactly, they would be working on. He only divulged that they would be expected to "give up untold nights and weekends and that you will work harder than you have ever worked in your life."[24]

As eventually became standard practice at Apple, the phone team was segregated even from other Apple employees. "The team took one of Apple's Cupertino buildings and locked it down," Forstall would recall in later court testimony. "It started with a single floor with badge readers and cameras. In some cases, even workers on the team would have to show their badges five or six times."[25]

The floor became known as the "purple dorm."

"On the front door of the Purple Dorm we put a sign up that said 'Fight Club' . . . because the first rule of that project was to not talk about it outside those doors," Forstall testified later.

Early on, the software teams came up with the user interface features that would go on to make the eventual iPhone feel so magical. There were the features inherent to multitouch, of course, like pinching or widening your fingers to zoom in and out on pictures or graphics. And scrolling through items was a simple as flicking one's finger up or down the screen. Forstall himself came up with the idea of the double tap to zoom in on text when browsing the web. An Apple UI whiz named Bas Ording came up with the famous rubber band effect, whereby the screen would seem to bounce when a user scrolled to the bottom. To organize the various programs the phone would need, the now-familiar grid of icons was settled upon relatively quickly. Little, squarish, chiclet-like icons seemed to make the most sense for fingers to target. "It's funny, the look of smartphone icons for a decade to come was hashed out in a few hours," says Imran Chaudhri, a senior Apple designer.[26]

Meanwhile, the P1 design was still in the running, pushed by Fadell's iPod team. Given the limitations of the scroll wheel, some were pushing for a hardware keyboard like that on the BlackBerry. "It was definitely discussed," Fadell said later. "It was a heated topic."[27] The software-only keyboard was, in fact, proving to be the biggest problem arguing against the P2 track. It was one thing to implement typing on a multitouch keyboard as big as a table. It was another thing entirely to type on a tiny piece of glass only a few inches in surface area.

Still, after six months of running a bake-off between the P1 and P2 options, Jobs was ready to pick a horse and go with it. "We all know this is the one we want to do, so let's make it work," Jobs said, pointing to the touchscreen P2.[28] It

was a risk to go with the untested technology, especially with the keyboard issue still unresolved, but in the end, the possibilities inherent in multitouch were just more exciting.

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IF THE SOFTWARE was problematic, the hardware was even more so. It didn't help that the engineers working on the hardware were forbidden from seeing the software that they were ostensibly designing for—and vice versa. The main issue was that Apple simply hadn't dealt with the basic realities of cell-phone design before. Apple also had no experience with the rigorous testing required to (a) function on Cingular's network and (b) pass FCC muster. Handset manufacturers usually left this process to the carriers to sort out, since they were the ones that knew their networks the best. But Apple was keeping AT&T at arm's length, jealously guarding its design even from its nominal partner. And so, the team instigated an intensive "dogfooding" regimen among Apple employees. In technology parlance, dogfooding is when you test your beta product yourself, eating your own dogfood, as it were, in order to work out the bugs. Apple engineers were instructed to live on their iPhones exclusively, to catch bugs in every possible use case.

Dogfooding was coupled with a signal-testing regimen that was nothing if not ad hoc. Often, the process involved little more than driving the phones around in cars and finding dead zones and diagnosing dropped calls on the spot. "Sometimes it would be 'Scott [Forstall] had a call drop. Go figure out what's going on,' " an engineer named Shuvo Chatterjee remembered. "So, we'd drive by his house and try to figure out if there was a dead zone. That happened with Steve too. There were a couple of times where we drove around their houses enough that we worried that neighbors would call the police."[29]

Parallel to these efforts, the industrial design team under Jony Ive was churning out prototype after prototype. One intermediate hardware design that Ive was particularly fond of was based on an iPod-like design from the P1 track. The device was made of brushed "aluminium," of course, so Jobs and Ive loved it. But in this instance, the master aesthete had to bow to the laws of physics. "I and Ruben Caballero [an antenna expert] had to go up to the boardroom and explain to Steve and Ive that you cannot put radio waves through metal," Apple engineer Phil Kearney said. "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 asked, '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."[30]

When it came to other hardware decisions, Jobs's exacting demands won out, often to the eventual benefit of the final product. The screen of the phone was originally supposed to be composed of the same plastic that iPod screens were made of. But after a day in Jobs's pocket, one prototype unit suffered from deep and permanent scratches thanks to his car keys. Jobs switched the screen from plastic to Gorilla Glass, even talking the glass maker Corning into converting an entire factory in Harrodsburg, Kentucky, just to produce the quantities Apple needed. This actually further complicated things for the hardware team, since the multitouch sensors now had to be embedded in glass, and glass was an entirely different proposition from embedding in plastic.

Other issues were solved by a clever combination of hardware and software. To make sure the screen turned off when a user pressed it to her face to answer a call, a proximity sensor was embedded. The problem of the phone accidentally turning on in a user's pocket was solved when a UI designer noticed the sliding lock and unlock mechanism on airplane bathroom doors. Thus, "slide to unlock" was born. Small but meaningful details were added as a result of the dogfooding feedback; details like a ringer switch to silence phone calls that came at inopportune times. The first person to actually receive a phone call on an iPhone was Andy Grignon. He was in a meeting and didn't recognize the caller's number, so he hit the ringer switch to ignore the call. "Instead of being this awesome Alexander Graham Bell moment," Grignon recalled that the first iPhone call was anticlimactic, "it was just like, 'Yeah, fuck it, go to voicemail.' "[31]

But the biggest headache, until late in the development period, remained the functionality of the software keyboard. The problem was finger size. If you tried to type, say, the letter "e," your finger might trigger a range of other letters instead. The solution, as ever, came from clever design. Apple engineers used artificial intelligence techniques to create an algorithm that would predict which letter a user might want to type next. For example, if someone types the letter "t," there is a very high probability that they will want to type "h" next. So, the letter "h" would, to the naked eye, look like it stayed the same size on the keyboard when, in fact, the "hit area" for the letter h would get bigger. After that, the "e" would likely be huge as a hit region. "The," after all, is a common word. This predictive typing algorithm saved the iPhone from repeating the failures of the Newton.

Even weeks and days before Apple was scheduled to announce the iPhone at the Macworld Conference in January 2007, the phone was still incredibly buggy.

Demoing a half-baked product was not how Steve Jobs was used to doing things, but his hand was forced in this case. The fact that an Apple phone was coming was common knowledge. Reviewers, bloggers and reporters had whipped up an incredible frenzy of excitement over what they dubbed the "Jesus Phone." It *had* to debut.

Just after New Year's Day 2007, Apple took over the Moscone Center in San Francisco to host the iPhone launch event. A lone Apple employee was tasked with shepherding all twenty-four of the demo units in the trunk of his Acura, driving up from Apple headquarters in Cupertino, and delivering them to San Francisco. He was followed by a second car piloted by Apple security. The engineer wondered what would happen if he got into an accident and the demos were destroyed.

Jobs rehearsed his presentation for six solid days, but at the final hour, the team still couldn't get the phone to behave through an entire run-through. Sometimes it lost Internet connection. Sometimes the calls wouldn't go through. Sometimes the phone just shut down. In these moments, Jobs's notorious temper blazed to life. "It quickly got very uncomfortable," Andy Grignon said. "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 fucking up my company,' or, 'If we fail, it will be because of you."[32]

At the last minute, the engineers identified a "golden path," a specific set of demo actions that Jobs could perform in a specific order that afforded them the best chance of the phone making it through the presentation without a glitch. For example, Jobs could send an email and *then* surf the web, but if he reversed the order, the phone tended to crash. The engineers also masked the WiFi that Jobs would be using onstage so that audience members couldn't jump on the same network and possibly clog it up. AT&T brought in a portable cell tower to make sure Jobs would have a strong signal when he made his own first demo phone call. But, just to be on the safe side, the engineers hard-coded all the demo units to display five bars of cell strength, whether that happened to be true or not.

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IT'S A SIGN OF THE technologically obsessed era we live in that Steve Jobs's Macworld keynote presentation on January 9, 2007, has gone down as a seminal moment in popular culture.

"This is a day I've been looking forward to for two and a half years," Jobs said somberly, walking across the width of the stage. "Every once in a while, a revolutionary product comes along that changes everything."

Apple executive Eddy Cue would say later: "It was the only event I took my wife and kids to because, as I told them, 'In your lifetime, this might be the biggest thing ever.' Because you could feel it. You just knew that this was huge."[33]

The words Jobs used to unveil the iPhone have become mythical:

So . . . Three things: A widescreen iPod with touch controls. A revolutionary mobile phone. And a breakthrough Internet communications device. An iPod . . . a phone . . . and an Internet communicator . . . An iPod . . . a phone . . . are you getting it? These are not three separate devices. This is one device! And we are calling it iPhone.

Somehow, the demo went off without a hiccup. Watching the video now, as hundreds of millions have done on YouTube, Jobs is masterful, seemingly at the very height of his powers as a showman. You can feel him simultaneously stoking and feeding off the excitement emanating from the crowd. It is almost as if Jobs can't believe what he is demoing at the same time the audience can't believe what they're seeing.

The original iPhone that went on sale June 29, 2007, was based on the Purple 2 prototype, code named M68, with device number iPhone1,1. With more than a decade of perspective, perhaps the most remarkable thing about the first iPhone was that it was so completely, conceptually perfect, right out of the gate. Automobiles had to evolve for almost forty years until they settled into the standard configuration we are familiar with today. On their first attempt, the team at Apple managed to stumble upon the perfect form factor, the perfect incarnation of the modern smartphone. Smartphones had, of course, existed for several years previous to the iPhone, but the standard form of the smartphone as we know it today—no physical keyboard, a single slab of screen, a "black mirror" that is both a reflection of, and a conduit for all of our hopes and desires —they nailed it on the first try. And that's quite remarkable. There's a very good reason why, to this day, almost all smartphones essentially look like that first iPhone.

The iPhone, of course, solved the threat to Apple's iPod franchise by basically obsoleting the stand-alone MP3 player, just as it was designed to do. But what's often overlooked now is how important that "third" thing was that Jobs declared the iPhone to encompass at its core: an Internet communicator. Smartphones and PDAs had been gaining the ability to browse the web for years. But the iPhone had that comparatively enormous LCD screen that took up nearly

the entire surface real estate of the device. And it had all of the multitouch advancements like pinch to zoom and double-tap to center on text. These were the things that made browsing the mobile web useful and enjoyable for the first time. Jobs himself would later say the miracle of mobile browsing was what truly made the first iPhone stand out. The iPhone delivered the "real" Internet like a "real" computer did. The iPhone finally made the mobile web a self-evident, useful feature. "It's the Internet in your pocket for the first time," Jobs said.[34]

The first iPhone, however, cannot actually lay claim to being the device that finally made the smartphone into the most successful computing device in history. Something people tend to forget about the first iPhone is how neutered it was. It was launched onto the nearly obsolete EDGE network. Cingular/AT&T was still in the process of building out its 3G network, so for that first-generation phone, users had to make do with snail-like data speeds. The first iPhone also lacked a GPS sensor, so even though you could use mobile maps in the first iPhone, the experience wasn't as seamless or accurate as it is today. The first iPhone couldn't shoot video, and didn't even have a front-facing camera, so the era of the "selfie" didn't come into being until the fourth generation of the iPhone, three years later.

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THE BIGGEST REASON the first iPhone is not the iPhone of popular memory is that it didn't have the App Store. The first iPhone had the usual suite of PDA-like apps, a calendar, a notepad, a calculator, a clock, a stock ticker and a weather app, all designed by Apple. The only outside apps were the maps provided by Google and YouTube. There was no second screen to swipe to beyond the homescreen—because there were no other apps to put on the homescreen.

The original, App Store–less iPhone was very much Steve Jobs's platonic ideal of a closed and curated computing system, a perfect, hermetically sealed device. For several months after the iPhone's launch, Jobs was actually vocally opposed to the very idea of an app store, refusing to let outside developers infect his perfect creation. He told the *New York Times*: "You don't want your phone to be like a PC. The last thing you want is to have loaded three apps on your phone and then you go to make a call and it doesn't work anymore. These are more like iPods than they are like computers."[35]

But, in fact, Jobs was wrong about that. The iPhone very much *was* a computer. Back when the bake-off between the P1 and P2 models was happening, there was a simultaneous decision to be made in terms of what

software would be used to run the device: a souped-up version of the iPod OS, or a scaled-down version of OS X, the OS that ran Apple's Mac computers. OS X came out the winner. Right out of the gate, the iPhone was, at least when it came to software architecture, a tiny but fully capable Mac. That meant that developers could write real, actual, full-blooded applications for the iPhone, if only Steve Jobs would allow them to do so.

In the end, the battle to do an app store was a replay of the argument over opening up iTunes to Windows users a few years earlier. Just as before, everyone inside Apple wanted to do it, and Jobs kept saying no. But in the end, just as with iTunes, the result was the same. Jobs finally caved, telling those who had been haranguing him, "Oh, hell, just go for it and leave me alone!"[36]

The iPhone App Store was launched in July 2008, alongside the second-generation iPhone 3G. As the former Apple employee Jean-Louis Gassée has said, "It was only then that the iPhone was truly finished, that it had all its basics, all its organs. It needed to grow, to muscle up, but it was complete as a child is complete."[37] In the first quarter the iPhone was on sale, Apple and AT&T sold about 1.5 million iPhones.[38] In the quarter after the App Store launched, Apple sold 6.89 million, exceeding 10 million total iPhone sales for the first time, and surpassing RIM's BlackBerry to become the bestselling smartphone in the United States.[39]

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IT WAS THE APP STORE that inspired users to adopt smartphones and make them mainstream. Smartphone ownership in America went from 3% in 2007 when the iPhone was announced, to more than 80% a decade later.[40] At the time of this writing, the iPhone has sold over a billion units and Apple is the most valuable company in the world. Certainly, some of this stratospheric success was due to the hardware designs that Jony Ive came up with, which made each successive iPhone an object of lust and envy. We can also credit Steve Jobs's consummate showmanship for making the smartphone into the iconic device of the modern era. But more than anything else, we have to credit the App Store for turning the smartphone from a niche category that only appealed to early adopters and on-the-go professionals into a universal computer that appealed to everyone and their mother.

In a larger sense, the iPhone and the App Store were triumphs of software. "Software wrapped in a beautiful package," was how Steve Jobs liked to describe it.[41] Just as Bill Gates had intuited all the way back in the 1970s,

software was the key differentiator. Software was what made mobile computers indispensable. "There's an app for that" was not just a clever marketing concept, it actually reflected how smartphones—via mobile apps—were able to subsume all of the lessons of the Internet Era. Getting the latest news, buying from Amazon or eBay, searching Google, looking up a fact on Wikipedia, listening to an unlimited selection of music (the promise of Napster), watching a YouTube video, streaming Netflix—every single miracle of the web revolution of the previous fifteen years found new life on the tiny computers in our pockets. Thanks to the triumph of software, the iPhone even allowed Apple to create a true platform, an ecosystem that the mobile computing world has to exist within. It was just what Marc Andreessen had dreamed of back at Netscape.

But if we're being entirely honest, there's one specific category of app that was crucial to the iPhone taking off when previous smartphones didn't.

One of the key launch apps on the first day the App Store went live? Facebook.

Social networks succeeded in making the Internet truly a personal experience. Smartphones, combined with social networks, took personal computing and made it almost intimate computing. Where would social media be without mobile computing, without smartphones: the perfect tools, always on hand to record and organize the ephemera of our daily lives? Would Facebook be at a billion users today if smartphones, in the example of iPhone, hadn't presented the perfect vehicle for social media consumption *and* production? And if not for the iPhone kick-starting the smartphone revolution, whither Snapchat? Or Twitter? Much less, Uber?

The argument could be made that social media finally broke through to the mainstream because smartphones went mainstream at the same time. And a complementary argument could be made in reverse: that the iPhone took off when other smartphones hadn't because it arrived on the scene just when Facebook was going parabolic.

Rather than too soon, the smartphone+social media represented a moment when two world-changing technologies arrived at just the right moment.