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THE RISE OF MOBILE

Palm, BlackBerry and Smartphones

In the technology world, the ultimate success of a new idea is very much dependent on timing. Even great ideas that are quite obviously "the next big thing" can fail to deliver on their promise because the underlying technology or infrastructure isn't mature enough yet. Streaming video was supposed to be big, going back to the days of Real|Audio and Broadcast.com, but it took the example of Napster and the advent of broadband Internet connections before YouTube could take off. SixDegrees couldn't succeed because it was birthed in a world before ubiquitous digital cameras. Facebook got the timing right on that detail, but it also cracked the social-networking code by achieving critical mass just as another key technology was having *its* breakthrough moment.

For many long years, mobile computing was an idea before its time. Dozens of attempts to jump-start mobile computing as an industry crashed and burned without gaining widespread adoption. After the PC revolution and just prior to the dot-com era, there was a brief fad in Silicon Valley for handheld computers. It was the logical next step: once there was a computer on every desk, why not put one in every pocket? In the late 1980s and early 1990s, there was a minibubble as investors rushed to fund dozens of handheld, mostly pen-based, computer startups, both on the software and the hardware side. GO Corp. burned through $75 million dollars in VC money in an attempt to become the Microsoft of handhelds by creating the operating system standard for pen computing. A company called GeoWorks attempted something similar with its GEOS. General

Magic was an Apple spin-out that Pierre Omidyar of eBay; Tony Fadell, the father of the iPod; and Andy Rubin, the inventor of the Android operating system, all worked at before going on to fame and fortune elsewhere.

Before it was spun out, General Magic was one of two top-secret research-and-development teams[1] inside Apple Computer. The other team, which remained in-house, was called Newton, and it would be responsible for the highest-profile early handheld computing device. As the 1980s turned into the '90s, the Newton team was working on a tablet computer the size of an eight-and-half-by-eleven-inch sheet of paper. This experimental device weighed about eight pounds but was only three-quarters of an inch thick. Named Figaro, the machine was navigated using a stylus on a grayscale screen, had three processors, an internal hard drive and wireless networking and got about ten hours of battery life. Oh, and it cost about $8,000 to produce.[2] Per device.

In early 1991, a young Apple marketing executive named Michael Tchao convinced Apple's then-CEO, John Sculley, to switch gears and have the Newton team work on a smaller, ultraportable computer—one that could fit comfortably in a person's palm. Sculley became an evangelist for the idea of a near-pocketable computer, a category of devices he termed personal digital assistants, or PDAs. At the 1992 Consumer Electronics Show, Sculley declared that there would soon be a "$3.5 trillion" market for such devices.[3]

The result of this strategic pivot, the Newton MessagePad, was released to the public on August 2, 1993. It cost $699, ran on four AAA batteries and weighed 0.9 pounds. But at 7.24 inches by 4.50 inches (about the size of a VHS cassette) it was hardly pocketable, except in the most generously sized pockets.[4] With optional add-ons, you could send faxes and (eventually) email using a wired modem. But the main features of the Newton were its productivity apps, including a calendar, address book, to-do list and notepad. It had no keyboard, instead boasting a touchscreen that you interacted with using the included stylus. The intention was, you would write on the Newton just as you would if you were writing on a piece of paper. The software would interpret your handwriting and turn it into on-screen text.

Or, at least, it was supposed to. The Newton was ultimately done in by its notoriously flaky software, which, more often than people could tolerate, simply refused to recognize what had been written. Oddly enough, the longer the word, the better the software was at translating, because longer words gave the handwriting interpreter more information to work with. The Newton struggled primarily with shorter, monosyllabic works like "or" and "the."[5]

The Newton's software was supposed to learn your handwriting over time, but *PC Week* complained that, "The Newton is almost worthless . . . basically shelfware. After three weeks, it still couldn't consistently differentiate my 1's from my t's."[6] Other reviews were just as scathing. "Apple promised too much and failed to deliver a useful device," wrote the *New York Times*.[7] In a classic example of a rolling PR catastrophe, after the Newton came out, the comic strip *Doonesbury* spent a week turning the Newton's handwriting recognition foibles into a national joke.

Apple had expected to sell 1 million Newtons in the first year. It sold only 85,000.[8] Subsequent models would improve immeasurably, especially the second-generation device that was Jony Ive's first assignment after being hired at Apple. But it was too late. In the court of public opinion, the Newton could never overcome its poor reputation.

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THE NEWTON'S HIGH-PROFILE failure took the entire nascent handheld computing market down with it. Most of the handheld startups went out of business in the coming years, just as Silicon Valley was turning its attention to the web. One of the handhelds that made it to market, only to be dragged down in the Newton's wake, was the Zoomer, a $700, one-pound pen computer that debuted in October of 1993, selling only 60,000 units before being discontinued.[9] But even a firsthand brush with failure could not kill the dream of a "computer you could carry in your pocket," not for Jeff Hawkins, the inventor of the Zoomer. Hawkins had founded Palm Computing in January 1992 to produce the Zoomer, and even after its first product failed in the marketplace, Hawkins and a small band of Palm loyalists merely went back to the drawing board and began sketching out a follow-up device.

Hawkins had a hunch that handhelds had attempted to do too much, had been too complex, too ambitious. He intuited that people didn't necessarily want a second computer, they wanted an *accessory* to their existing computer. So, he focused on only a few key use cases for his new device: a calendar, an address book and a memo pad. These applications would be designed to sync to regular computers when the device was connected by wire; when out in the "wild," as it were, the device would stick to its primary, simple task: helping the user stay organized.

Hawkins began carrying a rectangular piece of balsa wood, about the size of a deck of cards, around Palm Computing's offices. With this dummy mock-up, Hawkins tested out the ideal dimensions that would allow a handheld device to

be useful in everyday situations. The resulting product would be known as a PalmPilot (though it had various names due to branding and trademark issues over the years). By sticking to Hawkins's ethos of simplicity, not only was the Pilot eminently pocketable (it was about a third the size of the Newton and weighed 5.5 ounces); it could also hew to a $300 price point, thereby making it seem like a logical desktop or laptop accessory.

Palm would sell 1 million Pilot units in eighteen months on the market, thereby becoming the fastest-selling computing device in history.[10] It was still a pen-based gadget—there was no physical keyboard—but Hawkins had solved the handwriting input issue that had beguiled the Newton by creating a single-stroke shorthand alphabet known as "graffiti." This improvised input language worked well and the Pilot proved useful, especially to businesspeople on the go, with a simple plug-in-and-sync interface, much akin to what would later become commonplace with the iPod and iTunes system. By 2001, Palm had sold 21 million of these pocket computers and secured a 70% market share of a reborn PDA market.[11]

In Canada, another small company took notice of the rebirth of the pocket computer and decided to come at the market from a different angle. If Jeff Hawkins focused on the simplicity of productivity and organization while on the go, Mike Lazaridis, the founder of Research In Motion (RIM), focused on communicating while on the go. In 1996, RIM launched the Inter@ctive Pager, a two-way wireless messaging device. Initially, it was just a glorified pager. But Lazaridis and the RIM engineers concocted clever ways to hook into personal and corporate email systems and eventually, RIM was delivering, essentially, email in your pocket. The first Inter@ctive Pager, the 900, and its successor, the 950, released in September of 1998, shared the Palm ethos of simplicity, pocketability and utility on the go. Measuring 2.5 ✕ 3.5 inches and weighing 4.5 ounces, the RIM pagers mimicked the PalmPilots in their form.[12] "Everyone else was trying to add a radio to a PDA," recalled Dr. Peter Edmonson, RIM's chief radio engineer. "Whereas Mike's mindset was how to add a PDA to a radio."[13]

RIM's devices were designed to be "always online" as opposed to syncing to a computer occasionally, as the PalmPilots were designed to do. Email was "pushed" to RIM's gadgets over the wireless network, so you didn't have to plug in to find your messages; your messages found you, wherever you happened to be. When you got something new in your inbox, the device would buzz and a red LED would indicate that you had a new message to read. Because RIM had previous experience working with radios and wireless networks, its pagers were fast and incredibly energy-efficient. The 950 could last for three weeks on a

single AA battery. And RIM didn't mess with the touchscreen technology that Palm was so married to. Instead, RIM innovated tiny, fully functional keyboards designed to be used with one's thumbs. "For me, it was all about keyboards," Lazaridis has said. "Jeff [Hawkins] went off and did touch screens. I went off and tried to develop something with a keyboard."[14]

On January 19, 1999, RIM launched the 850, the first device that would carry the name BlackBerry.[15] It was also the first mobile device that synced completely with email systems, so sending and receiving an email on the go was as seamless as communicating from your computer. If you sent an email from your BlackBerry, it showed up in your Sent folder when you got back to your desk. Messages read on the BlackBerry were marked as read on your computer, and vice versa. RIM also began integrating more PDA-like functionality into the BlackBerry and subsequent models, so that eventually they had all the functionality of a PalmPilot, but with comprehensive messaging capabilities.

The BlackBerry's marketing tagline was "Always on. Always connected." As the 1990s turned into the 2000s, among a class of professionals for whom never being "out of the loop" was of paramount importance, the BlackBerry took off like wildfire. "It very quickly became a status symbol," recalled wireless research consultant Andy Seybold.[16] BlackBerry proved popular on Wall Street, among lawyers, in Hollywood. When you watch old video of the AOL/Time Warner merger announcement, you can see Jerry Levin and Steve Case checking their BlackBerrys to see how the news was affecting the stock price of their respective companies. In the disputed election of 2000, the Gore campaign managed its response to the "hanging chad" situation, minute-by-minute, over their BlackBerrys. During the terrorist attacks of 9/11, most cell service went down, but BlackBerry users could still get their messages out. Congress subsequently bought BlackBerrys for every senator, representative and thousands of Capital Hill staffers, such was BlackBerry's reputation for keeping people in the know.[17] When Oprah Winfrey broadcast one of her annual "Oprah's Favorite Things" specials, she gushed: "I cannot live without this. It's with me everywhere I go. It's called a BlackBerry. It's literally changed my life."[18]

What so entranced these early adopters of the BlackBerry was just that ability to always be connected to information. It's the reality we're all familiar with today: the phenomenon of never being out of touch. But in the early 2000s, this was a new experience. For BlackBerry users, there was never a moment when they couldn't be reached, when their device didn't beckon to them with a

new alert of someone trying to reach them or some new piece of information to digest *right away*. BlackBerry users were the first people to confront the social etiquette implications of conversations and person-to-person interactions being interrupted by digital notifications. And they were the first to wrestle with the uniquely obsessive mindset that an always-on information device can engender. This pull of the "now" only got worse as BlackBerrys eventually gained web-browsing functionality and new applications such as the BlackBerry Messenger instant messaging service. The devices earned the sobriquet "CrackBerry" because users seemingly couldn't tear themselves away.

"It should be reported to the DEA," Intel chairman Andy Grove told *USA Today*.

"It is the heroin of mobile computing," Marc Benioff, CEO of Salesforce, said in the same article. "I am serious. I had to stop. I'm now in BA: BlackBerry Anonymous."[19] Communication, as it so often did over the course of the Internet Era, proved to be the killer application for mobile computing. But then, heroin is a "killer" application as well.

Palm eventually released handsets with radios that mimicked the BlackBerry and enabled messaging, especially the popular Palm VII in 1999, which added email to Palm's traditional organizer applications. But by 2005, RIM had replaced Palm as the largest seller of pocketable computers.[20] And at that point, the handheld computing market that both Palm and RIM were chasing was careening headlong toward something even greater than any of the mobile computing pioneers could ever have imagined.

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PDAS, PAGERS, EVEN MP3 PLAYERS, were the hot consumer electronics products in the early 2000s. But in this burgeoning world of electronic devices that were competing for room in your pocket, there was only one undisputed king: the cell phone. Other devices might be able to capture the imagination of certain market segments, but cell phones were seemingly for everyone. There were 100 million cell phone users worldwide as early as 1995. By 2001, that number surpassed 1 billion. And midway through the decade, nearly a billion handsets were being sold every single year.[21] Because phones were clearly the most popular pocket devices on the planet, it made sense that the features that were turning handheld gadgets into must-have objects of envy began to be subsumed into phones as well.

The very first smartphone was the Simon Personal Communicator, which was developed by IBM back in 1992. On sale to consumers for just six months,

from 1994 to 1995, retailing for $895, the Simon had almost all the components that we would recognize in a modern smartphone. It could send and receive cellular calls, of course, and it could also send and receive pages wirelessly. It could do email and fax, but those required the user to dial in via a landline. It could sync via an adapter cable to a computer, and could therefore store and work with data files. The majority of the device consisted of a touchscreen, where a row of icons could be found that summoned up an array of apps, including an address book, a calendar, an appointment scheduler, a calculator, a world clock and an electronic notepad. The Simon weighed slightly more than a pound, but at 8 inches long by 2.5 inches wide by 1.5 inches thick, it was more of a brick than a pocketable device. It had a rechargeable battery, and even an expansion slot for adding more memory. The plan was to eventually add additional hardware and software features like maps, a GPS module, real-time stock quotes and more.

Unfortunately, the Simon never got there. IBM sold only 50,000 Simons before discontinuing the product. "It's all about time frames," says Frank Canova Jr., who led the device's development at IBM.[22] "The Simon was ahead of its time in so many different ways."[23] All the features of a modern, communicating, mobile computer were already there, but the world just wasn't ready for it.

Too soon.

But as Palm and RIM found success with PDAs and pagers, the broader cell phone industry had second thoughts about pocket computing. The 800-pound gorilla of the cell phone industry in the late 1990s and early 2000s was Finland's Nokia. In 1996, it released the 9000, the first of its Communicator series of phones. The Nokia 9000 opened up, clamshell-style, to reveal a full QWERTY keyboard. It had a web browser as well as digital camera connectivity. It could make calls, of course, and send messages, and had the now-usual suite of contacts, notes, calendar and calculator apps. But since cellular data plans were rare and expensive, the Communicator series was not a mainstream success.

Too soon.

The first cell phone to be explicitly called a "smartphone" was the Ericsson R380, released in 2000. Its lid flipped open to reveal a full touchscreen for web browsing, email, apps and games. Other manufacturers soon followed Nokia and Ericsson's lead, releasing a wide range of devices, all of which married PDA and messaging function to phones, some going the Palm route, with touchscreens, and some the BlackBerry route, with thumb-friendly keyboards. And the handheld pioneers themselves also joined the fray, with the Palm Treo line of

smartphones beginning in 2002, and the BlackBerry Quark that Oprah called one of her favorite things targeted toward mainstream consumers beginning in 2003.

Then, a whole slew of manufacturers jumped into the smartphone game. In order to stand out from the crowd, every imaginable feature started getting crammed into phone handsets. The first phone with integrated GPS was released in 1999. Japanese consumers were buying phones with integrated digital cameras as early as 2000. Many phones began to offer rudimentary web browsers and even streaming video by the middle of the decade.

Too soon.

All through the first half of the 2000s, mainstream consumers collectively yawned at the explosion of smartphone and mobile computing features. By 2005, there were only 3.5 million smartphone subscribers in the United States.[24] As late as 2006, only around 6% of the 150 million phones shipped in North America were "smart."[25] Even though it was used by 85% of Fortune 500 companies, RIM didn't reach a million subscribers until 2004.[26] Palm's sales actually began declining, beginning in 2000.

The entire computer, electronics and technology industry was converging on one singular device, one transcendent product that would seemingly be everything to everybody. And yet, few people seemed to care. All of these new features, all of these new technologies and computing innovations were converging inside the cell phone, pointing to a world of always-on, always-connected, always-updating information, but aside from those CrackBerry addicts and hard-charging professionals, most people didn't see the point.

Back in 1998, Steve Jobs famously told a *Businessweek* reporter that "a lot of times, people don't know what they want until you show it to them."[27] In the case of the smartphone, in the case of the technology that would soon bend the entire arc of modern life toward the ubiquity of mobile computing, that would certainly prove to be true.