

*It is the mark of an inexperienced man not to believe
in luck.*

—Joseph Conrad,
Polish-born English novelist

Chapter One

LIGHTNING DOESN'T STRIKE TWICE

What Happens When You're Lucky but Think You're Smart

Companies that were once in the right place at the right time sometimes forget that they were lucky. By taking advantage of their good fortune, they grow powerful. However, in some cases these companies focus on their power and position in the market and ignore signals that their market is changing. Because these companies take their success for granted, they do not plan for a time when an upstart will challenge them. They rely on the illusion of invulnerability as a strategy.

Lucky companies—that is, companies that find themselves in the right place at the right time—face a common dilemma. The entrepreneurs who start these companies typically understand that they are lucky; they have created an innovative product or service and brought it to market just when there happened to be a demand for their offerings. They hit the market right, and their strategy has garnered substantial rewards. However, these same entrepreneurs often lose sight of their humble beginnings and early missteps; they start to believe their own marketing hype, and they attribute their success solely to their own smarts. At this point,

management often begins to think that their company is invincible. Such arrogance can cause a once lucky company to falter, but this doesn't happen overnight. It may take a decade before arrogance turns an enterprise with a promising future into a dismal disaster.

This chapter presents examples of successful companies that were unable to sustain their leadership positions, explores the combination of luck and good judgment that enabled these companies to succeed in the short term, and examines the processes and practices that led to these companies' downfalls. Entrepreneurs can learn a lot about success by studying the reasons why others fail.¹

In the technology market, we tend to live in the moment. It is difficult to imagine a time without the Internet, a time when so much information wasn't available to so many people so quickly. Few of us remember when a single computer covered an entire city block and sold for millions. Not long ago, Microsoft was the most important emerging company in the world of high tech. Today a new batch of behemoths, with names like Google, Amazon.com, and Facebook, appear to be unstoppable. As the technology industry has grown, new companies have emerged in a steady stream and grown gargantuan and powerful. But, as I've mentioned, these companies tend to become arrogant with the growth of their revenue and influence. Sometimes they are smart enough to keep focused on their long-term strategy and the factors that brought them success, and by doing so they attain sustainability. Other times, failing to recognize that the only constant is change, they lose focus, assume their market position is permanent, and, ultimately, fail.

In the computer industry, there are many examples of companies that were lucky enough to be in the right place at the right time, but then weren't savvy enough to harness that luck in order to sustain their market position. Three particularly good examples of this pattern are Wang Laboratories, Digital Equipment Corporation, and Sun Microsystems. Each of these companies became huge and powerful by entering the market at just the right time. They

were all lucky. They all had spectacular opportunities, which they took advantage of and executed brilliantly. Yet not one of these companies exists today. In 1999, Wang Laboratories sold its remaining assets to Getronics N.V., a subsidiary of the Dutch IT & Telecommunications firm KPN. In 1989, Digital Equipment Corporation was sold to Compaq Computer, Inc. (which was later purchased by Hewlett Packard). Sun Microsystems was sold to Oracle Corporation in 2009. So what happened? All three were blinded by their own hype. They began to believe that their power would sustain them into the future and that it was unnecessary to change with the times.

Why were these companies unable to sustain themselves? Let's take a look at each of them in greater depth and examine what happened that led to their downfall.

WANG LABORATORIES: WHAT HAPPENS WHEN A COMPANY STARTS BELIEVING ITS OWN MARKETING

The tale of the rise and fall of Wang Laboratories is the story of a company that ultimately failed because it started believing its own marketing hype. At the center of the story is its legendary founder, An Wang.² He was a brilliant engineer who, at the beginning of his career, understood the importance of seizing new opportunities. What set Wang apart from other entrepreneurs of his era was the foresight to design technology that met the needs of a new market at just the right time. For example, when he founded Wang Laboratories in 1951, he focused on one of the most important needs of the nascent computer industry: core memory. He had some early luck: IBM needed his core memory invention for its new electronic calculating machine. With IBM's cash in hand, again Wang showed the same foresight by smartly moving to the next area of innovation: automating control systems that were used by companies producing

machine tools. Once again, an industry leader, this time in control systems, licensed the technology that Wang designed.

But Wang had bigger plans than to simply be a supplier of parts to big industry players. He wanted to build a company that would be a power in its own right. To do this, Wang had to find a new market where he could create his own products, rather than sticking with a market that had launched Wang Labs. Wang had the vision to select a new market—automated typesetting. Although Wang's great expertise in engineering allowed him to build a product, he didn't have the money to self fund this ambitious effort and so he partnered with an industry leader, Compugraphic. This partnership taught Wang some painful lessons. Wang's agreement with Compugraphic provided cash to fund the fledgling company, but it came at a huge price. Although Compugraphic paid Wang \$30,000 for each machine that Wang built, Compugraphic owned the exclusive rights to build these systems. In essence, it was the same type of deal Wang had with both of his previous ventures.

Again, Wang was not satisfied. This arrangement meant that Wang's engineering talent was leveraged for another company's gain. Not ready to give up, Wang moved forward again. As the 1960s dawned, Wang applied his engineering expertise to yet another technology revolution—the programmable calculator. Power once reserved only for hugely expensive mainframes was now available on a scientist's or engineer's desk. This was revolutionary, and it was not surprising when the desktop calculators that Wang designed began to dominate the market. At last Wang was able to escape the shadow of being a supplier of components to big industry players. This was the opportunity Wang had been waiting for. To prepare for the growth he craved, Wang took his company public on the New York Stock Exchange in 1967. The offering was hugely successful and enabled the fledgling company to expand outside of the United States, opening sales, service, and administrative offices in North America, Europe, and Asia.

At this time in the company's history, Dr. Wang used the same intuition that had led him to abandon both the control systems market and the programmable calculator market. He recognized that both of these markets were becoming too competitive.³ Big companies with lots of money were entering these markets and would be able to commoditize them. It was time for Wang to seek out the next frontier. Rather than starting from scratch as he had done before, in 1970 Wang purchased a company with programming experience and used that experience and knowledge to enter the computer industry. Initially, Wang struggled to create a valuable computer system, but finally did so with its fourth computer, the 2200, which was designed to address the needs of companies that couldn't afford or manage a mainframe computer. The new computer fit into the hottest emerging market, the minicomputer.

This was a tough market, with big players like IBM and HP breathing down Wang's neck. But Wang ingeniously combined his phototypesetting experience with word processing capability. This was a time, when, if someone wanted to do word processing, he or she needed to know how to program a computer, so most businesses still relied on typewriters. By the mid-1970s, Wang Labs made two immensely important innovations to the computer: it added a visual display, and it turned its general-purpose computer into a dedicated word processing system. These innovations solved critical problems for business customers who wanted to automate their word processing tasks. It was the right solution at the right time.

The company was smart enough to recognize that it had a surefire hit and invested significantly in marketing. While this marketing achieved Wang's objective of positioning the company as a leader, it also sowed the seeds of its downfall. Wang was positioning itself not just as a leader that could solve customers' word processing problems, but also as the leader for the future. At this stage in the company's evolution, its aggressive marketing paid huge dividends. In fact, in 1978, even though it was only the

thirty-second largest computer company, it spent almost as much as IBM did on television advertising, creating a persona that was bigger and bolder than its customer base or revenue justified. Wang cleverly presented itself to the world as a powerful company with pragmatic business technology. In one of its most memorable advertising campaigns, Wang proclaimed that, even though it was much smaller, the company was “gunning” for IBM. A bold approach to a wide-open frontier. It was also a careless move. Although Wang was clearly an increasingly important company, it did not have the same breadth of technology as competitors like IBM and Digital. In positioning itself as a market leader well beyond its capability, management began to internalize its marketing message. This is a dangerous approach for any emerging company.

It was even more dangerous because the marketing strategy was incredibly effective and Wang became well known in the market. Armed with its newfound market position and strength, the company did what many companies in this position do: it made acquisitions to increase the size and scope of its offerings. These included InteCom, Graphic Systems, Informatics Legal Systems, and minority interests in U.S. Satellite Systems and Telnova. Although large IT departments shunned these new systems, business units flocked to the company—bypassing IT altogether. They purchased Wang word processing systems because these systems got the job done better than larger, more complicated, and more expensive systems. And the company didn't stop with dedicated word processing systems. As Wang's market share in word processing systems grew, so did the number of its competitors. Hundreds of companies offered similar capabilities. Although Wang may not have viewed these companies as a threat, the company did expand the capabilities of its systems. However, unlike in previous decades, when Wang had moved boldly to change its strategy as markets changed, the company now focused only on holding on to its

market share. To that end, the company supplemented its systems with the ability to manage data processing on its minicomputers. Now, business units that were comfortable with Wang word processing could use the same platform to add databases and computing. In essence, Wang developed a new market space, called the integrated information system, that was precisely what business users needed. For the next several years, Wang was able to leverage its strong position with customers who depended on its word processing systems.

During this period, the company's revenue and scope of business exploded. The company grew at an average of 61 percent a year. The fact that their systems could do both data and word processing was a big advantage and helped differentiate the company from its competitors. Today, this sounds like a simple feat to accomplish. After all, computing of words or data couldn't be all that different. However, at the time that Wang entered the market, this was a competitive advantage, and addressing this customer need paid off. By 1983, almost half of the company's revenue came from Fortune 500 companies.

By 1982, Wang reached \$1 billion in sales and doubled that two years later. But beneath the veneer of success there were signs of trouble. The company was no longer as disciplined and focused as it had been in its early days. The management team grew complacent and arrogant—more driven by individual goals than by corporate goals. The marketing department became the source of “the truth.” The industry was changing, but Wang didn't seem to notice. New players were entering the market. Companies that had simply purchased truckloads of new Wang systems every year now turned their attention to PCs. PCs began flooding into the same departments that had depended on Wang's unique combination of word and data processing. PCs from IBM were available with software from Microsoft. They were less expensive than Wang's minicomputers. For Wang, it was the beginning of the end.

Wang continued to spend money on marketing at the rate of an IBM, although it was much smaller. Even when it became clear that the company was losing money and market share, it clung to the belief that its size and revenue would be enough to lead it into the future. Even in 1985, when the high-flying company's revenue decreased by 66 percent and 5 percent of the workforce was laid off, Wang's management was still not convinced that they faced a long-term problem. They continued to believe that they would remain an industry leader. As the 1980s waned, Wang's revenue was more than \$3 billion. Although it introduced its own personal computer and other software offerings, these could not stop the company's slide. Making matters worse, customers were now interested in the emergence of computing platforms that weren't dominated by a single vendor. An environment called Unix, based on an operating system developed by AT&T that was becoming prevalent with a myriad of startups, was also challenging Wang's market position. Dr. Wang and his team refused to recognize that the market was changing and continued to assume that their traditional products would prevail in the long term.

A company like Wang Laboratories doesn't die in a day. It is a slow-motion process that includes missteps, overreaching, misreading of the market, arrogance, and fear. In 1992, the company filed for bankruptcy protection.⁴ Had Wang paid attention to new competitors and moved quickly to create new strategies and introduce different products based on where customers were headed, the company might have survived.

Here are the three key mistakes that Wang made that ultimately led to its demise:

Mistake One: Arrogance. It is ironic, but, in Wang's early years, the company survived and ultimately thrived because it was willing to learn from its mistakes, take risks on innovations, and even walk away from its most successful product, the

desktop calculator, to move to the future.⁵ But standing still is never an option. Once Wang became a billion-dollar company, it lost its focus. It clearly had a great marketing team and marketed itself as IBM's biggest competitor. Ultimately, it became obsessed with competing directly with IBM, not only in word processing—its key market advantage—but in data processing as well. The company's management team grew arrogant and started to view its marketing department as the source of truth rather than as the personnel responsible for positioning products. Management began to believe that it was the most powerful company in the computer market; *surely*, they reasoned, *our innovation in minicomputers and integrated word and data management, our development of broadband communications, and our favorable name recognition position us for primacy in the market.* Because of that belief, Wang spent more than it was really able to on marketing. Even when the company was losing money and market share, it continued to believe that size and revenue would be enough to sustain it.

Mistake Two: Blindness to market realities. Wang Laboratories, like its competitors, had its own proprietary hardware, operating system, and software. This was the normal way computing was then done. But in the late 1980s the market was changing. Microsoft was continuing to build its dominance as a de facto standard computing platform at the low end. At the high end of the market, the Unix operating system and open standards were starting to gain customers' attention. Expensive integrated hardware-software systems were no longer as attractive as they had been a couple of years earlier. However, unlike in Wang's early days, when it was willing to take the risk of moving to the next frontier, now company management refused to change. It decided to stick with its existing offerings long after the market

had moved on. When the company finally decided that it had no choice but to change, it was too late.

Mistake Three: Assuming that market share is enough. In the late '80s, Wang's revenue was more than \$3 billion. However, the company was losing market share and profits were sliding quickly. Yet the company continued to proclaim that the emerging companies that were starting to take away market share were not a threat, because the company was bigger than the upstarts.

Wang Laboratories had been well positioned at just the time when business units of large companies were looking for a pragmatic and affordable alternative to the mainframe computer. And Wang had great intuition to know when to transform his fledgling company into new markets at the right inflection point. However, as his most successful endeavor expanded, his company focused more on holding onto an incumbent position rather than innovating in a changing market, and this eventually led to Wang's downfall.

DIGITAL EQUIPMENT CORPORATION: SOMETIMES THE SMARTEST KID ON THE BLOCK LOSES

Like Wang Laboratories, Digital Equipment Corporation got its start in the 1950s and innovated in a market dominated by mainframe computers that were complex and difficult to use and manage. Ken Olsen, the founder of Digital, innovated to create a more interactive and customer-friendly computer complete with a display.⁶ It wasn't clear in the early 1960s, but this was the birth of the minicomputer market—and it was revolutionary. Companies could now buy a computer for around \$100,000, instead of spending more than a million dollars for a comparable product. Bigger and better-funded companies, like General Electric and

RCA, had failed miserably in the computer industry. What it took to leapfrog the industry was a bold startup that could leverage experimental computers out of MIT.

Digital broke the mold of conventional wisdom at the time. When Digital came to market, almost all computers were leased, but Digital decided to sell its computers instead. This was not an isolated decision; rather, it was the philosophy of the startup. The new company's strategy was to succeed by fostering innovation and setting up a management structure that encouraged the free flow of ideas. Any engineer with an innovative idea was allowed to pursue that dream. Up until this point, most computer companies had followed the traditional product engineering disciplines common in industrial manufacturing. Therefore, Digital Equipment's more entrepreneurial approach to product creation was a radical departure from the norm.

The company's biggest breakthrough was the PDP-8 computer. It was the right product at the right time in the market. Businesses were hungry for a computer that was inexpensive and allowed them to harness computer power at a fraction of the cost of the mainframe computer, which continued to dominate the market. Although no company was going to be able to unplug its powerful mainframe systems, what they needed was a front-end system that could be integrated into their mainframes. Digital hit the market just right. By pricing the PDP-8 at only \$18,000 for a sophisticated and powerful system, Digital took the market by storm, selling nearly fifty thousand units in its first year. It wasn't just individual business units that bought the systems; vendors that packaged business software onto systems found the pricing irresistible. Inevitably, Digital attracted a new type of customer—companies that would buy the systems, package them with their own software, and resell them to small and medium-sized businesses. But Digital's bigger success came with the follow-on to the PDP-8, the PDP-11.⁷

Introduced in 1970, the PDP-11 marked a turning point for the minicomputer market and for Digital. Not only did the PDP-11 include powerful advances in computing engineering, but it also could be manufactured easily by less-skilled technicians. Therefore it became the Model T of the computer era. Selling the PDP-11 for just \$10,800, the company sold six hundred thousand units. Digital followed up on this successful model with one of the most significant minicomputers in the market, the VAX-11, announced in 1977. The VAX-11 was a much more high-end system—a “super mini-computer” intended to bring Digital close to the mainframe market. Thus Digital could compete against much more expensive mainframe systems and still make a significant profit. Over the life of the company, it sold four hundred thousand of these systems.

The success of these minicomputers was both a blessing and a curse for Digital as it continued to grow. The company was indeed at the right place at the right time. However, rather than continuing to innovate, as it had done with the movement from the PDP-8 to the 11, the company’s attitude toward innovation began to change. It was hardly noticeable at first, but this attitude shift had a major impact in the early 1980s, when Digital, like Wang, showed reluctance to enter the PC market. IBM had already announced its successful PC, and conventional wisdom at the time was that Digital—the company that had virtually invented the minicomputer market—would once again lead. Unfortunately, internal factions within Digital disputed just how the company should respond to the PC, and rather than base the architecture on new engineering principles, it simply repurposed the trusty PDP-8. The result was an unfocused and less-than-impressive entry into the market, with a lackluster set of PCs. At the same time, more than a hundred competing minicomputer companies were challenging Digital’s leadership in minicomputers.

Like many hardware companies, Digital invested heavily in software. And like many hardware companies, it did not understand

how to build sustainability in software. What transpired is ironic and tragic. If you look at the areas in which Digital innovated in software, the list is impressive, even by today's standards of software innovation. The company, for example, had innovative database products (which it sold off to Oracle); it had a product called Notes, similar to Lotus Notes, that was used internally by developers. Its proprietary operating system, VMS, was the foundation of Microsoft's NT operating system, which evolved into Microsoft's current server offerings. Digital even had an innovative office system called All-in-1. And there were hundreds of other innovations in workload automation, business rules, knowledge management, and more.⁸

Unfortunately, Digital didn't truly understand the value of software. The economics of hardware and software are very different, and Digital was primarily a hardware company. A company spends a lot of money up front developing hardware. However, once the platform is released into the market and it is at the right price point and functionality for the market, revenue comes quickly. With software, the sequence is just the reverse. The initial investment, although large, isn't as big as the investment for hardware, but revenue flows in more slowly. Customers want to try a product before they buy it. They want time to evaluate and test the software. So revenue may not start flowing for a year. However, once the software proves to meet the needs of customers, revenue keeps coming for a long, long time. The up-front expense in software development pays huge dividends for years. The incremental costs are small, but if a company has been used to enjoying the immediate revenue from hardware, the transition to a software model is painful. Digital's inability to recognize the long-term value of software led to its eventual demise.

In the end, Digital tried to revive itself by coming out with new hardware. Digital launched its ambitious Alpha processor in 1991, to a room filled with company executives, press, customers, and industry analysts. But it was too little, too late. Although the

characteristics of the new hardware were impressive, it was clear that the system would not ship for at least eighteen months, and the company had nothing to sell in the meantime. Digital was paying scant attention to software, because the revenue model was uncertain compared to hardware revenue. In addition, Digital was convinced that it had to remain with its proprietary hardware and operating system. The road ahead was uncertain—and in January 1998 Digital was sold to Compaq for \$9.6 billion.

Like Wang, Digital made fatal mistakes. Here are the three most significant:

Mistake One: Arrogantly assuming that great engineering trumps everything else. There is no question that Digital was a great engineering company. It innovated at almost all levels. For example, its hardware was well designed and executed. Its operating systems were well ahead of the market. Even though Digital never considered itself a true software company, it developed innovative software that, in some cases, proved to be years ahead of the market. Great engineering is a prerequisite for success. Without it, the marketplace will punish you without mercy. However, a company has to provide the right level of innovation to meet customers' needs, and Digital never did that. There was no planning based on customers' greatest problems; instead, the company simply assumed that if customers appreciated the amount of engineering sophistication built into its products, they would buy. In the end, Digital continued to innovate its engineering, but customers stopped paying attention because the company didn't innovate with the customers in mind.

Mistake Two: Ignoring market changes. As the market began to shift toward openness and standards, Digital continued to do things its own way. It assumed that the level of engineering and

technical sophistication of its own operating system would always be compelling. Therefore, while Digital's competitors moved to provide Unix as an option and introduced more advanced chip technology called RISC, Digital stayed with its existing approaches. When PCs became popular, Digital assumed that, from an engineering perspective, PCs simply wouldn't make the grade. Digital offered an underpowered set of offerings and gained no momentum. It could have offered sophisticated offerings to its loyal customer base, but missed an important opportunity.

Mistake Three: Believing that size matters above all else. Size does matter, of course, but not in and of itself. Digital acted like a winner even when it wasn't winning. It acted as though its size and power made it unstoppable. Nothing is more emblematic of this lack of insight than the last huge customer meeting the company held in 1989. It was the largest customer conference in the company's history. The meeting was so large that Digital rented the *Queen Elizabeth II* to entertain its best customers. The conference was a showcase for the company's latest products and innovation. Such a massive and expensive event was clearly designed to impress. But the event also revealed underlying problems in execution of new products and the inability to hold onto existing customers. In a sense, Digital substituted a massive marketing event for a well-executed marketing and product strategy. Digital may have been showcasing impressive technology, but their execution was not relevant to their consumer base. Size matters—but only if it is combined with brilliant execution. Regardless of how big or small a company you are, first and foremost you must meet your customers' needs. Digital needed to stay focused on—indeed, even obsessed with—the changing computing landscape. Instead, the company rested on its laurels and its size. In

the end, Digital couldn't sustain its competitive advantage in the market. Neither its size nor its brilliance in engineering were enough to keep profits flowing. The sale to Compaq followed, and by 1998, Digital was history.

Digital's demise resulted from arrogance, blindness to market change, and failure to remain focused on its key strengths. Had Digital's management team adapted to changing market conditions, it could have leveraged its strong brand into the new century.

SUN MICROSYSTEMS: WHY DEFT EXECUTION IS AS IMPORTANT AS A GREAT VISION

Like both Wang and Digital, Sun Microsystems was lucky; the company provided precisely the right type of products to fill a current market need. Unlike both Wang and Digital, Sun Microsystems used a standard operating systems platform to propel itself to the forefront of a new industry and leapfrog its competition. Sun's vision was based on a belief that the network of computers, not the individual computer itself, provided value to customers. Although both Wang and Digital had invested in networking technology, their focus had been around networking those computers within the four walls of a company. Sun took that vision a step further by recognizing that computing could be linked across the world. "The network is the computer" was the company's clarion call.⁹

The company was founded in 1982 by Stanford University students who had designed a new generation of computers called "workstations." Unlike the PC, the workstation offered a new level of power, integrated networking, and high-resolution graphics. The PC was perfect for the individual business user; the workstation was intended for the power user such as an engineer, scientist, or animator. Because the system was built by Stanford student Andreas

Bechtolsheim without financing, Sun used as many off-the-shelf components as possible. For example, instead of taking the years required to build an operating system from scratch, Bechtolsheim selected the Unix operating system, widely used because it was freely available for research purposes.

AT&T owned the Unix operating system and relied on it as the foundation for its network, but antimonopoly regulations prohibited the company from entering the computer business. However, the company needed its operating system in order to continue developing its communications software. As part of the agreement with the U.S. government, it was required to freely license this technology to both commercial companies and academic institutions. Because of this, Unix was widely used by engineers and scientists across the market—and especially at research universities across the world. In addition to the fact that it was freely available, it also had important technical capabilities, including the ability to execute more than one task at the same time.

Bechtolsheim called his new workstation Sun 1 (Stanford University Network) and began selling it for \$10,000. Within a year of Sun's founding, several other Stanford graduates joined Bechtolsheim. The strategy of using off-the-shelf hardware and software propelled the company into a leadership position. In fact, Sun's biggest competitor in the workstation market, Apollo Computer, had actually come to market a year earlier than Sun. Many observers in the market considered Apollo's architecture and operating system to be more sophisticated than Sun's. However, the fact that Sun based its workstation on a mature and proven operating system was a lucky move that in the end served Sun much better than Apollo's elegant but proprietary approach. Sun's platform was much more accessible to partners that were also using the Unix operating system. Therefore, if a customer wanted software for the Sun platform, it was more likely to be available. In contrast, Apollo had designed its own version of an operating system, which had

many of the components of Unix but included many additional features.¹⁰ It was much more difficult and costly to move new software onto the Apollo environment.

Recognizing the benefits the company gained by using an open systems operating system like Unix, Sun decided to use its luck to further its goals in the market. The decision to use the Unix operating system was not a brilliant strategic decision in 1982; it was simply a pragmatic and lucky move based on the need to get to market without spending a lot of money. Now Sun's management team got smart. Leveraging the benefits of the Unix decision, the company decided to make open systems a strategic marketing advantage. One of the most important early moves the company made was to broadly license the product that differentiated Sun from its competitors: a distributed file system called the Network File System (NFS). NFS was originally designed to enable Sun workstations to share data across the network, and it was one of the primary selling points for the Sun sales force. In 1984, Sun suddenly decided that it would begin licensing NFS without cost to any company that wanted to use it. Today this practice is commonplace. Most software companies not only will license their key innovations, but also will often offer a free version of the software in order to popularize it in the market and turn it into a standard that all programmers will use. In 1984 this was an innovative strategy, and it had an immediate impact. Apollo Computer had relished competing against NFS with its own distributed file system but when Sun decided to broadly license its own software, NFS was transformed almost overnight into the market standard.¹¹

Sun's licensing of NFS and the dramatic rise in the importance of standards and open systems propelled Sun into a leadership position in the market. Over the next three years, the company grew at an annual rate of 145 percent. By 1988, Sun was a billion-dollar company—only six years after the company was formed. In contrast, eBay—one of the Internet's greatest commercial success stories—did

not reach a billion dollars in revenue until its seventh year of operation.

The billion-dollar marker is very important in the technology sector. It means that the company is well established and has significant momentum. It also means that the company isn't in danger of disappearing overnight. Now Sun was the leader in the growing workstation market. Increasingly, software companies began building their applications to support the Sun hardware and operating system platform. The growing power of Sun meant that it had the money to buy competitors. It purchased a myriad of companies to cement its dominance in the Unix operating system market. It also began to license its operating system to run on other companies' hardware platforms.

The first ten years of Sun's history were far and away the most lucrative.¹² The company grew quickly, gained market share, and dominated the market for Unix workstations. But the market was starting to change. Other market leaders, sensing that Unix was growing, began investing in the market. IBM, Apple, Compaq, and Digital Equipment entered the market in force. At the same time, Microsoft and its partner Intel were making important inroads into the enterprise computing market. So, in addition to focusing on its Unix competitors, Sun's leaders also set their sights on challenging Microsoft. Just as Sun had gained traction because Unix was so important in the scientific and engineering market, Microsoft was convincing business leaders that its own platform could support their broad needs. Microsoft had developed a significant set of partners that supported its platform. Sun believed that if it ignored and challenged Microsoft it could convince customers to change their loyalty. But battling Microsoft became a challenging and frustrating strategy that never succeeded.¹³

Sun thought of itself as a hardware company, and clearly its entry into the market—the Sun1 workstation—was a market leader. It is typical for companies that have a huge hit, as Sun did with Sun1,

to have difficulty replicating that success. But Sun was persistent, both developing new hardware and buying hardware companies such as Cray, one of the pioneers in high-end systems. Sun also recognized that it would need to move up market in order to sustain its leadership in workstations, and in 1995 the company introduced high-end systems priced at more than \$500,000.

Unfortunately, even as Microsoft began to gain power in the market, Sun's leaders were hesitant to embrace PCs. The growth of the PC market, and Sun's inability to embrace market changes, hurt the company. It fought against Microsoft and other companies that were beginning to change the dynamics of computing. Sun's vision for computing was compelling—the network is the computer. In essence, it posited that with a series of computers ranging from low-end workstations to high-end systems, supporting all the same software and the same connectivity, computing would be seamless.

But hardware alone would prove to be not enough to sustain Sun in the long run. Without software, it is hard to differentiate systems. In fact, in its early days, Sun focused on building systems software like its Network File System, and on ensuring that the software elements such as the operating system made the overall system work well. It was that early foray into software that helped the company grow. However, Sun was never comfortable with software as a market unto itself. The most important example of Sun's inability to embrace the commercial value of software was Java, a programming language that was developed by Sun in the 1990s. Initially, it was intended to be a consumer programming platform for the television market. However, Sun's engineering team began to see that the programming language had great potential in the emerging commercial Internet and had the vision to release it into the market. Java took off quickly and evolved into an important standard for companies across the globe. Sun had something hot. The potential for growth was huge, but unfortunately, Sun was never able to find a way to capitalize on Java.

Sun did understand that it needed software to propel itself to the next level. It began buying small, innovative software companies that had great technology but little revenue. Sun determined that, with its size and scope, it could use these innovative platforms to transform itself into a solutions company.

At the same time that Sun began to purchase these companies, the dot-com era began to take shape.¹⁴ Once again, Sun was in the right place at the right time. Its hardware was well designed and it was a market leader—especially in workstations and smaller servers. These systems were relatively cheap, and the companies that were driving the dot-com revolution bought them like they were candy. Suddenly Sun was hotter than ever. It began advertising itself as “the dot in dot com.” With the focus on the dot-com market, it was much easier to focus on hardware than on software. The money was good. But while hardware market share continued to drive the company forward, there were signs of trouble. In 2001 the dot-com market, propelled by lots of irrational venture capital investment, came to a crashing halt. Companies that were funded based on the hope that somehow their crazy ideas would turn into huge revenue someday began to fail at an alarming rate. Sun had banked on these companies and their partners and customers buying Sun’s hardware. And because there was little incentive to invest time and effort in software, there was no buffer when the market turned. Suddenly, it began to look like the party was over. Sure, Sun had lots of software, but the software brought in very little revenue. Its most important future product, Java, never delivered much revenue at all—especially considering how important it had become to customers.

Sun realized that it needed to take quick action to reset expectations and revitalize the company. It focused on two key fronts: (1) deepening its focus on hardware in terms of evolving its proprietary hardware architecture, and (2) purchasing companies that would add to its hardware depth. The company was also pragmatic enough to realize that it had to offer its customers products

based on the Intel architectures that most software companies supported. This helped Sun begin selling lower-priced products to appeal to smaller companies. At the same time, the company began to look at areas like storage and data management—both important and growing revenue opportunities.

These moves helped in the short term, because they enabled the company to again turn a profit—albeit a small one—by 2005. But the trend didn't last. The company's CEO for more than ten years, Scott McNealy, decided to leave the presidency and bring on a former McKenzie consultant as CEO. Jonathan Schwartz, a charismatic and brilliant thinker, had a lot of interesting and bold ideas about how to bring the company back into a leadership mode. He was determined to combine Sun's important hardware platform with software. Software was the one area where Sun could not figure out how to make money, though not for lack of trying. Between 1987 and 1992, the company purchased about thirty-five software companies. Some of these companies had excellent technologies and were at the leading edge of their markets. Schwartz had a radical idea. He decided to pull a page out of the NFS playbook and take the open source route with Sun's software. He proclaimed that, from then on, all of Sun's software would be free and the company would charge for commercial support of its offerings. The idea was that customers would purchase Sun's hardware, integrated with its valuable software. There would be a highly streamlined and simple pricing model for all software.

This wasn't necessarily a bad idea. Open sourcing a company's best proprietary software does sometimes work, but timing and execution can make all the difference. When you make a move like this, you have to be lucky—as Sun had been when it open sourced NFS. It wasn't so lucky with the open sourcing of its software this time around. The problem was that Sun's hardware was becoming increasingly commoditized; when it open sourced everything, it became difficult to build revenue.

The writing was on the wall. While Sun was inching into new emerging markets such as cloud computing, its core business was under attack from heavyweight players like IBM, HP, and EMC.¹⁵ As Sun sank deeper into the red, customers began to get nervous about the long-term viability of the company. Sun had achieved a lot. It had managed to become a \$13 billion company. However, it was clear it would be hard to replace revenue lost in a competitive hardware market with software that had been essentially offered to customers at no cost. In the end, Sun was acquired by Oracle for a little more than \$7 billion. Oracle viewed Sun's hardware knowledge, its cloud computing software assets, and its installed base as a way to challenge companies like IBM, HP, EMC, and Cisco.

In the end, Sun's demise can be attributed to three key mistakes:

Mistake One: Failure to adapt to industry changes. When a market begins to change, players must move fast or be left behind. In its early days, Sun Microsystems executed brilliantly. It understood the value it was creating in getting to market before competitors by leveraging mature and widely accessible technologies. However, rather than adapting as the market grew more competitive, it remained too tied to its earlier success. There is no such thing as permanent market dominance. Therefore, even when a company gains leadership in a market, there is no guarantee leadership will be sustained. Reinvention and re-examination of the changing market landscape is the only way to ensure survival. Sun did not change its strategy until it was already a distressed company. Thus when Sun began offering its software without charge, it appeared to be a desperate strategy. By the time Sun began to change, it was too late.

Mistake Two: Failure to innovate on an ongoing basis. A strategy has to be well balanced and well executed. Sun Microsystems's initial success was based on its ability to build a well-designed

hardware platform that was well integrated with all the software components needed to make the system meet customer demands. However, over time Sun was not able to continue the level of innovation needed to compete. During the dot-com era Sun was able to focus on selling commodity hardware to this growing market without having to create a balanced strategy of both hardware and software. Once the company began to seriously focus on software, it was already too late. A company will falter if it does not innovate on an ongoing basis.

Mistake Three: Failure to be flexible. There is danger in becoming ideological about products. Technologists tend to be passionate about the products they have spent their lives building and nurturing. Although this is understandable and quite human, it can also cause a company to head down dangerous paths. At a certain point, companies need to part with products or technology that had once brought them fame and fortune in order to move forward. Sun Microsystems fought hard against competing operating systems such as Microsoft Windows, refusing to support it even when customers demanded that support. Refusing to pay attention to changing customer demands can often be a fatal flaw.

There is nothing so dramatic in the business world as a company's emergence out of nowhere to become a powerhouse in an important market. Although it is possible to sustain market leadership over the long run, it is a complicated and unpredictable venture. Once a market becomes competitive, many market leaders are unprepared to fight to sustain their position. Companies too often assume that their leadership will last indefinitely. When companies are on a winning path, it is easy to ignore warning signs; such complacency may lead to disaster.

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