CHAPTER TWENTY-SIX

DESIGN PRINCIPLES

The Studio of Jobs and Ive

With Jony Ive and the sunflower iMac, 2002

Jony Ive

When Jobs gathered his top management for a pep talk just after he became iCEO in September 1997, sitting in the audience was a sensitive and passionate thirty-year-old Brit who was head of the company's design team. Jonathan Ive, known to all as Jony, was planning to quit. He was sick of the com-

pany's focus on profit maximization rather than product design. Jobs's talk led him to reconsider. "I remember very clearly Steve announcing that our goal is not just to make money but to make great products," Ive recalled. "The decisions you make based on that philosophy are fundamentally different from the ones we had been making at Apple." Ive and Jobs would soon forge a bond that would lead to the greatest industrial design collaboration of their era.

Ive grew up in Chingford, a town on the northeast edge of London. His father was a silversmith who taught at the local college. "He's a fantastic craftsman," Ive recalled. "His Christmas gift to me would be one day of his time in his college workshop, during the Christmas break when no one else was there, helping me make whatever I dreamed up." The only condition was that Jony had to draw by hand what they planned to make. "I always understood the beauty of things made by hand. I came to realize that what was really important was the care that was put into it. What I really despise is when I sense some carelessness in a product."

Ive enrolled in Newcastle Polytechnic and spent his spare time and summers working at a design consultancy. One of his creations was a pen with a little ball on top that was fun to fiddle with. It helped give the owner a playful emotional connection to the pen. For his thesis he designed a microphone and earpiece—in purest white plastic—to communicate with hearing-impaired kids. His flat was filled with foam models he had made to help him perfect the design. He also designed an ATM machine and a curved phone, both of which won awards from the Royal Society of Arts. Unlike some designers, he didn't just make beautiful sketches; he also focused on

how the engineering and inner components would work. He had an epiphany in college when he was able to design on a Macintosh. "I discovered the Mac and felt I had a connection with the people who were making this product," he recalled. "I suddenly understood what a company was, or was supposed to be."

After graduation Ive helped to build a design firm in London, Tangerine, which got a consulting contract with Apple. In 1992 he moved to Cupertino to take a job in the Apple design department. He became the head of the department in 1996, the year before Jobs returned, but wasn't happy. Amelio had little appreciation for design. "There wasn't that feeling of putting care into a product, because we were trying to maximize the money we made," Ive said. "All they wanted from us designers was a model of what something was supposed to look like on the outside, and then engineers would make it as cheap as possible. I was about to quit."

When Jobs took over and gave his pep talk, Ive decided to stick around. But Jobs at first looked around for a world-class designer from the outside. He talked to Richard Sapper, who designed the IBM ThinkPad, and Giorgetto Giugiaro, who designed the Ferrari 250 and the Maserati Ghibli. But then he took a tour of Apple's design studio and bonded with the affable, eager, and very earnest Ive. "We discussed approaches to forms and materials," Ive recalled. "We were on the same wavelength. I suddenly understood why I loved the company."

Ive reported, at least initially, to Jon Rubinstein, whom Jobs had brought in to head the hardware division, but he developed a direct and unusually strong relationship with Jobs.

They began to have lunch together regularly, and Jobs would end his day by dropping by Ive's design studio for a chat. "Jony had a special status," said Laurene Powell. "He would come by our house, and our families became close. Steve is never intentionally wounding to him. Most people in Steve's life are replaceable. But not Jony."

Jobs described to me his respect for Ive:

> The difference that Jony has made, not only at Apple but in the world, is huge. He is a wickedly intelligent person in all ways. He understands business concepts, marketing concepts. He picks stuff up just like that, click. He understands what we do at our core better than anyone. If I had a spiritual partner at Apple, it's Jony. Jony and I think up most of the products together and then pull others in and say, "Hey, what do you think about this?" He gets the big picture as well as the most infinitesimal details about each product. And he understands that Apple is a product company. He's not just a designer. That's why he works directly for me. He has more operational power than anyone else at Apple except me. There's no one who can tell him what to do, or to butt out. That's the way I set it up.

Like most designers, Ive enjoyed analyzing the philosophy and the step-by-step thinking that went into a particular design. For Jobs, the process was more intuitive. He would point to models and sketches he liked and dump on the ones he didn't. Ive would then take the cues and develop the concepts Jobs blessed.

Ive was a fan of the German industrial designer Dieter Rams, who worked for the electronics firm Braun. Rams preached the gospel of "Less but better," *Weniger aber besser*, and likewise Jobs and Ive wrestled with each new de-

sign to see how much they could simplify it. Ever since Apple's first brochure proclaimed "Simplicity is the ultimate sophistication," Jobs had aimed for the simplicity that comes from conquering complexities, not ignoring them. "It takes a lot of hard work," he said, "to make something simple, to truly understand the underlying challenges and come up with elegant solutions."

In Ive, Jobs met his soul mate in the quest for true rather than surface simplicity. Sitting in his design studio, Ive described his philosophy:

> Why do we assume that simple is good? Because with physical products, we have to feel we can dominate them. As you bring order to complexity, you find a way to make the product defer to you. Simplicity isn't just a visual style. It's not just minimalism or the absence of clutter. It involves digging through the depth of the complexity. To be truly simple, you have to go really deep. For example, to have no screws on something, you can end up having a product that is so convoluted and so complex. The better way is to go deeper with the simplicity, to understand everything about it and how it's manufactured. You have to deeply understand the essence of a product in order to be able to get rid of the parts that are not essential.

That was the fundamental principle Jobs and Ive shared. Design was not just about what a product looked like on the surface. It had to reflect the product's essence. "In most people's vocabularies, design means veneer," Jobs told *Fortune* shortly after retaking the reins at Apple. "But to me, nothing could be further from the meaning of design. Design is the fundamental soul of a man-made creation that ends up expressing itself in successive outer layers."

As a result, the process of designing a product at Apple was integrally related to how it would be engineered and manufactured. Ive described one of Apple's Power Macs. "We wanted to get rid of anything other than what was absolutely essential," he said. "To do so required total collaboration between the designers, the product developers, the engineers, and the manufacturing team. We kept going back to the beginning, again and again. Do we need that part? Can we get it to perform the function of the other four parts?"

The connection between the design of a product, its essence, and its manufacturing was illustrated for Jobs and Ive when they were traveling in France and went into a kitchen supply store. Ive picked up a knife he admired, but then put it down in disappointment. Jobs did the same. "We both noticed a tiny bit of glue between the handle and the blade," Ive recalled. They talked about how the knife's good design had been ruined by the way it was manufactured. "We don't like to think of our knives as being glued together," Ive said. "Steve and I care about things like that, which ruin the purity and detract from the essence of something like a utensil, and we think alike about how products should be made to look pure and seamless."

At most other companies, engineering tends to drive design. The engineers set forth their specifications and requirements, and the designers then come up with cases and shells that will accommodate them. For Jobs, the process tended to work the other way. In the early days of Apple, Jobs had approved the design of the case of the original Macintosh, and the engineers had to make their boards and components fit.

After he was forced out, the process at Apple reverted to

being engineer-driven. "Before Steve came back, engineers would say 'Here are the guts'—processor, hard drive—and then it would go to the designers to put it in a box," said Apple's marketing chief Phil Schiller. "When you do it that way, you come up with awful products." But when Jobs returned and forged his bond with Ive, the balance was again tilted toward the designers. "Steve kept impressing on us that the design was integral to what would make us great," said Schiller. "Design once again dictated the engineering, not just vice versa."

On occasion this could backfire, such as when Jobs and Ive insisted on using a solid piece of brushed aluminum for the edge of the iPhone 4 even when the engineers worried that it would compromise the antenna. But usually the distinctiveness of its designs—for the iMac, the iPod, the iPhone, and the iPad—would set Apple apart and lead to its triumphs in the years after Jobs returned.

Inside the Studio

The design studio where Jony Ive reigns, on the ground floor of Two Infinite Loop on the Apple campus, is shielded by tinted windows and a heavy clad, locked door. Just inside is a glass-booth reception desk where two assistants guard access. Even high-level Apple employees are not allowed in without special permission. Most of my interviews with Jony Ive for this book were held elsewhere, but one day in 2010 he arranged for me to spend an afternoon touring the studio and talking about how he and Jobs collaborate there.

To the left of the entrance is a bullpen of desks with young

designers; to the right is the cavernous main room with six long steel tables for displaying and playing with works in progress. Beyond the main room is a computer-aided design studio, filled with workstations, that leads to a room with molding machines to turn what's on the screens into foam models. Beyond that is a robot-controlled spray-painting chamber to make the models look real. The look is sparse and industrial, with metallic gray décor. Leaves from the trees outside cast moving patterns of light and shadows on the tinted windows. Techno and jazz play in the background.

Almost every day when Jobs was healthy and in the office, he would have lunch with Ive and then wander by the studio in the afternoon. As he entered, he could survey the tables and see the products in the pipeline, sense how they fit into Apple's strategy, and inspect with his fingertips the evolving design of each. Usually it was just the two of them alone, while the other designers glanced up from their work but kept a respectful distance. If Jobs had a specific issue, he might call over the head of mechanical design or another of Ive's deputies. If something excited him or sparked some thoughts about corporate strategy, he might ask the chief operating officer Tim Cook or the marketing head Phil Schiller to come over and join them. Ive described the usual process:

> This great room is the one place in the company where you can look around and see everything we have in the works. When Steve comes in, he will sit at one of these tables. If we're working on a new iPhone, for example, he might grab a stool and start playing with different models and feeling them in his hands, remarking on which ones he likes best. Then he will graze by the other tables, just him and me, to see where all the

other products are heading. He can get a sense of the sweep of the whole company, the iPhone and iPad, the iMac and laptop and everything we're considering. That helps him see where the company is spending its energy and how things connect. And he can ask, "Does doing this make sense, because over here is where we are growing a lot?" or questions like that. He gets to see things in relationship to each other, which is pretty hard to do in a big company. Looking at the models on these tables, he can see the future for the next three years.

Much of the design process is a conversation, a back-and-forth as we walk around the tables and play with the models. He doesn't like to read complex drawings. He wants to see and feel a model. He's right. I get surprised when we make a model and then realize it's rubbish, even though based on the CAD [computer-aided design] renderings it looked great.

He loves coming in here because it's calm and gentle. It's a paradise if you're a visual person. There are no formal design reviews, so there are no huge decision points. Instead, we can make the decisions fluid. Since we iterate every day and never have dumb-ass presentations, we don't run into major disagreements.

On this day Ive was overseeing the creation of a new European power plug and connector for the Macintosh. Dozens of foam models, each with the tiniest variation, have been cast and painted for inspection. Some would find it odd that the head of design would fret over something like this, but Jobs got involved as well. Ever since he had a special power supply made for the Apple II, Jobs has cared about not only the engineering but also the design of such parts. His name is listed on the patent for the white power brick used by the MacBook as well as its magnetic connector with its satisfying

click. In fact he is listed as one of the inventors for 212 different Apple patents in the United States as of the beginning of 2011.

Ive and Jobs have even obsessed over, and patented, the packaging for various Apple products. U.S. patent D558572, for example, granted on January 1, 2008, is for the iPod Nano box, with four drawings showing how the device is nestled in a cradle when the box is opened. Patent D596485, issued on July 21, 2009, is for the iPhone packaging, with its sturdy lid and little glossy plastic tray inside.

Early on, Mike Markkula had taught Jobs to "impute"—to understand that people *do* judge a book by its cover—and therefore to make sure all the trappings and packaging of Apple signaled that there was a beautiful gem inside. Whether it's an iPod Mini or a MacBook Pro, Apple customers know the feeling of opening up the well-crafted box and finding the product nestled in an inviting fashion. "Steve and I spend a lot of time on the packaging," said Ive. "I love the process of unpacking something. You design a ritual of unpacking to make the product feel special. Packaging can be theater, it can create a story."

Ive, who has the sensitive temperament of an artist, at times got upset with Jobs for taking too much credit, a habit that has bothered other colleagues over the years. His personal feelings for Jobs were so intense that at times he got easily bruised. "He will go through a process of looking at my ideas and say, 'That's no good. That's not very good. I like that one,'" Ive said. "And later I will be sitting in the audience and he will be talking about it as if it was his idea. I pay maniacal attention to where an idea comes from, and I even keep

notebooks filled with my ideas. So it hurts when he takes credit for one of my designs." Ive also has bristled when outsiders portrayed Jobs as the only ideas guy at Apple. "That makes us vulnerable as a company," Ive said earnestly, his voice soft. But then he paused to recognize the role Jobs in fact played. "In so many other companies, ideas and great design get lost in the process," he said. "The ideas that come from me and my team would have been completely irrelevant, nowhere, if Steve hadn't been here to push us, work with us, and drive through all the resistance to turn our ideas into products."