Big Blue's big adventure

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In 1991, Denny Wainwright was a senior planner at **IBM Corp.** in Boca Raton, FL. Wainwright was part of the small group working on a portable tablet computer: a pen-based system that permitted users to write on a screen, save the information and transfer it to other computers by a cable.

The group was having trouble finding a name for the product. IBM had a strong preference for its computers to be designated by numbers, as if only machines that sounded like they had been invented by George Jetson would be taken seriously by customers. The company had deviated from this tradition when it started selling its desktop PC, calling it the IBM PC, but the policy was still almost sacrosanct. Even so, the members of Wainwright's group felt that a number was too impersonal for their tablet computer.

Although many working on the project were young and more casual than the prototypical IBMer, Wainwright was a throwback to an earlier era at Big Blue. He was a gentle, formal man, invariably dressed in a suit and tie. At a meeting, Wainwright held up the small notepad he always carried. IBM used to issue the pads so employees could jot down to-do lists, or, better yet, earth-shaking ideas. The pad, which was designed to fit into a dress-shirt pocket, was bound in leather and embossed in gold with the IBM motto, "Think." Displaying the little leather legacy of IBM's past, Wainwright said, "Let's call it the Think pad."

The suggestion was more than a catchy bit of marketing. It connected the tablet computer to the philosophical foundations of the company. By 1991, "Think" had become mainly a marketing mantra at IBM, but, for founder Thomas Watson Sr., it epitomized his devout rationalism. In 1915, Watson told employees: "All the problems of the world could be solved easily if men were only willing to think." Within a few years this optimism would be challenged by the brutality of World War I. But, Watson and his son, Thomas Watson Jr., molded IBM in accordance with the rationalist's cheerful faith, which manifested itself as a slow-moving, orderly approach to product development, an obsessive concern for the needs of the customers (which were tended by an impeccably groomed sales force) and a benevolent paternalism toward employees. Ironically, the ThinkPad, which would become symbolic of the "new IBM" and the approaching 21st century, was in many ways rooted in the company's past, a result of a process first expounded by Watson Sr. This story is about that irony, and the lessons to be learned if we are patient enough to watch the future emerge from the past.

IBM helped push the personal computer into the mainstream when it began selling its PC in 1981. Eventually, though, it lost control of the PC marketplace, and didn't bring a portable to market until 1985. By then, portables were already becoming smaller and lighter. **Tandy** had scored in the market with its TRS-80 Model 100, a compact, lightweight computer with an integrated word processor and modem. In 1986, **Toshiba** unveiled a state-of-the-art portable line that became an immediate hit. IBM followed with the 5140 Convertible PC, but it proved to be nothing but an expensive doorstop made of dated technology.

In 1991, Dataquest, the San Jose-based market research firm, reported that during the previous year the top five laptop vendors had shipped 547,000 notebook computers worldwide. Toshiba led the way with 230,000, and **Compaq Computer** wasn't far behind at 200,000. IBM wasn't even on the

list, and Jim Cannavino was annoyed about that.

Cannavino was president of IBM's Entry Systems Division, a predecessor of the IBM PC Co., and until then his career had run parallel with the company's glory days. He had started out in 1963, a teenager with a high-school diploma and a talent for repairing mainframes. He proved equally adept with software and was promoted to lab director, where he began his steady rise through the hierarchy.

For Cannavino, the PC-era was frustrating, particularly his stint as the point man in IBM's battle with Bill Gates over the jointly developed OS/2 operating system, which eventually lost to **Microsoft**'s Windows. But Cannavino saw an opportunity for IBM to get into the mobile game when he spotted a prototype of a tablet computer. It had been produced by **GO**, a start-up that was hoping its software would become the standard operating system for pen products. "One of the first things I had to do was replace 70% of my executives," recalls Cannavino, who retired from IBM in 1995 and is currently CEO and chairman of **CyberSafe Corp.** of Issaquah, WA, a network security provider. "The decision-making process and development time at IBM were too slow for the market, and the executives I replaced were the ones who didn't believe change was required." Cannavino asked Kathy Vieth, a vice president with wide-ranging marketing experience, to oversee the portable- and pen-computing development team in Boca Raton.

"I thought Jim was onto something with the pen computer," says Vieth, who today is retired from IBM and lives in Vail, CO, where she runs her own consulting business. "IBM scientists are brilliant, but you don't necessarily need brilliant for successful products. You need common sense and street smarts. That was Jim Cannavino."

The name game

As the tablet neared completion and IBM was preparing to announce it to the press, a battle was still going on over Wainwright's suggested name. The pen-computing group wanted to call it ThinkPad. It felt that it was crucial for such a personal product to be named something that would not make consumers feel as if they had to graduate from MIT in order to use it.

Debi Dell, who was a product manager in the group, recalls: "IBM's corporate naming committee hated 'ThinkPad.' First, they were upset that the computer didn't have a number. How could an IBM computer not have a number? Then, since IBM sold so many products overseas, they were worried because ThinkPad wouldn't translate easily into foreign languages."

When Vieth announced the product in the spring of 1992, she ignored the corporate objections and simply referred to the tablet as the ThinkPad.

"The press loved it," says Dell. "And as soon as 'ThinkPad' caught on with people, the naysayers changed their tune."

But the tablet found few buyers. As Paul Carroll, author of *Big Blues: The Unmaking of IBM* (Crown Publishers Inc., 1993), observes, the market had shifted again and become "more focused on helping people communicate while on the move, rather than compute."

It so happened that IBM had that type of notebook computer under development. In fact, the company was just six months away from releasing it. But in early 1992, this computer also didn't have a name.

Two years before the tablet ThinkPad was announced, Cannavino became convinced that future mobile machines should be developed at the IBM design center in Yamato, Japan. The Japanese were

more experienced with consumer electronics than the Americans, and Cannavino felt their culture provided them with an advantage that could not be duplicated in the United States.

Cannavino explains: "In Japan, you'll find that competitors share more technical information among themselves than departments do in a [U.S.] company. The Japanese understand that a healthy industry is good for everyone. We haven't quite learned that lesson over here."

At the time Cannavino was relocating the mobile development operation to Japan, Tom Hardy was corporate manager of the IBM Design Program. Hardy had watched his company's portable line fail in the United States, and concluded that the aesthetics of a product as highly personal as a notebook computer was at least as important as the technology it contained. For some at IBM this was heresy. Yet IBM also had a history of working with some of the world's most distinguished industrial designers--Eliot Noyes, for instance, who played a lead role in the design of the IBM Selectric typewriter.

Another of these designers was Richard Sapper. Since 1980, Sapper had been an industrial design consultant to IBM. A German by birth, Sapper left his job at Mercedes, set up a studio in Milan, Italy, and promptly became famous for the spare, clean lines of his work--for instance, the Tizio lamp--and other designs that have been exhibited at the Museum of Modern Art.

In 1989, when Tom Hardy began managing the Design Program, he and Sapper had numerous discussions about a method for differentiating IBM products. They referred to it as the "personality strategy," which would attempt to add some excitement and innovation in order to rebuild the brand.

In the spring of 1990, preliminary work began on a notebook computer that was aimed solely at the Japanese market and would be known as the PS/55 Note. A meeting was held at Sapper's apartment/studio in Milan, the top two floors of a lovely, old apartment house. Hardy recalls riding up in a cage elevator with a wooden seat and thinking that his surroundings were far more pleasant than an IBM office. Hardy and Sapper were joined by Kazuhiko Yamazaki, the lead industrial designer of notebooks at Yamato, and an executive named John Wiseman, who was serving as Cannavino's eyes and ears.

Sapper felt that the design should be clean, plain and elegant. His wooden prototype was based on the *shoukadou bentou*, the traditional, black-lacquered, Japanese lunch box. It was small and compact. Desk space is scarce in Japan, and, since security is an issue with notebooks, a computer the size of a bentou box could be locked in a filing cabinet.

After the design phase was completed, the wisdom of Cannavino's decision to produce the notebook in the cooperative corporate environment of Japan began to be realized. Several firms who competed with IBM or supplied its competitors, collaborated on the project.

According to Kiyonori Sakakibara, a visiting professor at the London Business School, who in 1994 published a study of ThinkPad development: "**Ricoh Co. Ltd.** performed . . . the most critical task, assembling the computer's two circuit boards, so densely packed that each [had] chips on both sides. The black-and-white liquid crystal display was supplied by **Sharp Corp.** and other Japanese manufacturers."

In the spring of 1991, the PS/55 Note was released in Japan and became a best seller. It weighed barely over five pounds, and the coating of soft, black, rubberized paint provided a pleasant tactile sensation when you picked up the notebook.

The success of the PS/55 Note was in stark contrast to IBM's PS/2 Laptop, which had been released

two weeks earlier in Europe and the United States. The PS/2 had been designed by the IBM team in Boca Raton, and it flopped.

In the fall of 1992, when IBM released a European version of the PS/55 Note, it also sold well. Cannavino had been briefed by Hardy during the design and manufacturing of the new notebook, and Cannavino decided to have Sapper and the Yamato team create one for the U.S. market. For two years, Cannavino had been disappointed by IBM's inability to cut itself a meaningful slice of the billions being spent on mobile computers. He saw the problem as the inevitable result of the company's history.

"IBM had spent something like $30 million studying what size to make a notebook," recalls Cannavino. "I finally said, 'The business market has already decided what size they want it to be--81/2 by 11, like everything else in an office.'

"Spending that kind of a money on such a simple question sounds crazy, but IBM was geared to the lengthy development cycles of mainframes," Cannavino continues. "Each mainframe cost millions, so it made sense to study the design for a long time. But PCs and portables were basically consumer products, and the development cycle was moving down to about six months.

"Right before Christmas in 1991," Cannavino says, "we had a big meeting in Yamato, and I told the team I wanted the notebook done for the United States by summer. None of my executives thought it could be done. I disagreed and said we were staying in Japan--through Christmas and New Year's if necessary--until we worked it out. Needless to say we were back in the States before Christmas Eve. Six months, that was the key. We had to be done in six months."

As Sapper and the Japanese team went to work on the new notebook, forced to keep to Cannavino's drastically shortened timetable, they had no idea one of the key technologies that would differentiate the ThinkPad was languishing, unused, in IBM's labs.

TrackPoint's progress

No feature had a harder time finding a home in what would become the ThinkPad line than the TrackPoint, the red-tipped pointing stub embedded in the keyboard. Today, the TrackPoint is so symbolic of the brand that IBM places a bright red dot over the "i," in ThinkPad advertisements and brings up the same dot on the opening screens of its notebooks. Yet the TrackPoint is the result of an eight-year journey that taught one persistent IBM scientist and his supporters some frustrating lessons about the alchemy of turning corporate innovation into gold.

In 1984, Ted Selker read a study that showed it took three-quarters of a second for a computer user to shift his hand from the keyboard to the mouse, and another three-quarters of a second to shift it back again. Selker was a researcher at the **Xerox Palo Alto Research Center** (PARC). He thought that if he could construct a mouse that didn't require users to move their hands, he would save them time and trouble. Selker built a model containing a pointing stick jutting up between the "G" and "H" on a desktop keyboard, with two click buttons set into the bottom edge. Unfortunately, Selker had other assignments, and he put his model on the shelf.

Three years later, Selker was working as a scientist for IBM, and showed the prototype to his colleague, Joseph Rutledge, a mathematician. Selker recalls: "He loved it, and we went to work. The first and saddest thing we learned was that 100 years of research says that sticks are not good at pointing. Then we got even more depressed when our own study demonstrated that finger-pressure control was an inefficient way to move a pointer around a screen."

Over the next four years, Selker and Rutledge produced a functioning prototype, discovering that if they slowed down the cursor and made the movements of the stick less stiff, then people were able to use it accurately and comfortably.

"I thought the pointing stick was an obvious idea," says Selker. "You could get about 20% more editing time without handling a mouse. I started showing it around IBM, and at conferences and trade shows. A lot of people hated it. I did find some supporters, like John Cox, an IBM Fellow. John had a stroke and when some of his co-workers visited him in the hospital and asked if he wanted anything, John said, 'Get me one of Ted Selker's keyboards.' "

A significant problem Selker and Rutledge faced was that since the days of the Selectric typewriter, IBM has been renowned for its keyboards, and the pointing stick violated the integrity of this revered legacy. In addition, Selker and Rutledge soon realized that a product manager was the one person who had the power to bestow a meaningful blessing on an invention, but product managers also tended to be risk-averse--reluctant to approve features not tested in the marketplace.

Selker observed this phenomenon first-hand. He remembers demonstrating the new device for an executive high up the ladder who immediately carried the keyboard to a product manager and said, "Isn't this great? Can we make it?"

"Absolutely," the product manager replied. "As long as I'm not responsible for my P and L's."

Selker's situation wasn't unique. Numerous inventions of IBM scientists never escaped the lab. They were patented, and then deemed either useless or unmarketable, and left to languish in filing cabinets and boxes.

IBM's X-Files?

Fortunately for Selker, Jim Cannavino had been fascinated by the neglected technology for years. At the time, Cannavino was general manager of IBM's Personal Systems Group, and on weekends he used to browse through dog-eared files hoping to uncover a useful product.

"IBM scientists are brilliant, but you don't necessarily need brilliant for successful products. You need common sense and street smarts. That was Jim Cannavino."--Kathy Vieth

When he read about the pointing stick, Cannavino thought he saw something. He had long been concerned about how you could sit on a plane with a notebook computer and have enough room to manipulate the mouse. Cannavino disliked the current solution used by the IBM development team in Yamato--the trackball. He got himself one of Selker's and Rutledge's working prototypes, plugged it into his desktop computer and tested it. Then he phoned Selker and said, "Ted, this is great. How come we're not using it?"

"They won't let me," Selker said.

"Guess what, Ted," Cannavino replied. "I'm 'they.' "

Selker was thrilled by the call. "Jim had about 100,000 people working for him," says Selker, but even Cannavino's support didn't guarantee that the pointing stick would become a product, so Selker and Rutledge published their pointing-stick research in a scientific journal.

"Then we did a press release over everyone's dead body," says Selker. "*BusinessWeek* picked it up, and since the magazine is outside the company, IBM executives took notice."

Meanwhile, running parallel to Selker's campaign, Hardy was championing the pointing stick for the new notebook, and because his group oversaw the company's 15 design centers around the world, they were positioned to push the concept at IBM Japan.

"I also showed it to Bob Corrigan, who was head of the PC Co.," says Hardy. "Bob thought it was terrific, and so did Richard Sapper. We really needed the space-saving feature of the pointing stick, but, more important, using it would build brand image and give IBM product differentiation in a highly competitive market."

As a result of all these efforts, the pointing stick was put into testing in Japan, but there was one last hurdle for it to clear, the approval of Toshiyuki Ikeda, the notebook's product manager.

"I saw the first prototype of the TrackPoint, and it was not the equal of the trackball," recalls Ikeda, currently the director of OEM System Development for IBM. "I was reluctant to support a brand-new idea. But then a tester commented that the trackball is used by **Apple**, and it reminded the tester of our competitor's computers. Then I knew I had to do something different, so I made the decision. Ted Selker did a super job within a couple of months. We ran around to do-it-yourself shops in Japan searching for different types of parts."

For Selker and Rutledge, the transformation of their invention into a product was enormously satisfying. "What it taught me is that companies should have incentive programs for their scientists to become entrepreneurs [for their innovations]," says Selker.

Red badge of novelty

One final change made to the TrackPoint was suggested by Sapper. The tip of Selker's and Rutledge's pointing stick had been black, a color that got lost in the black ThinkPad keyboard. Sapper said, "Let it sing," and the tip was changed to red, which brought about a closing act of corporate silliness rivaled only by Abbott and Costello trying to decide who's on first.

Hardy explains: "IBM had a cherished standard which said that the only thing that could be red on a product was an emergency power switch, those enormous switches on the mainframes. To have the little TrackPoint tip subjected to this same standard was absurd, but, given the situation at IBM then, we knew the red dot wouldn't get through the system. So we toned it down a shade and called it magenta."

Soon afterward, Designer Yamazaki received a call from an IBM standards watchdog, who wanted to know why manufacturing had produced these tiny red parts.

Yamazaki said, "They're not red. They're magenta."

"No," replied the watchdog. "They're red."

The two men battled back and forth, then phoned Hardy to adjudicate the argument.

"They aren't red, they're magenta," Hardy assured the standards overseer, which led to a rambling, philosophical debate on the ontology of redness. Still, the watchdog held his position--no red allowed, not even if you called it magenta.

Hardy suggested that they take the argument to a higher level, confident that the watchdog would shrink from continuing such a trivial discussion with senior management. That was how it played out. The tip kept its magenta classification, and in the coming years, with the introduction of each new ThinkPad, the color of the rubber tip was increased a shade until it finally became a bright red symbol of the brand.

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