A Quarterback's Passion and Desire to Win

I first met Jim Meindl when we were fellow graduate students at Carnegie Tech (now Carnegie Mellon University) in Pittsburgh in 1956. My best early memories about Jim start at the time he organized an intramural touch football team at Carnegie Tech. I played on his team from the Electrical Engineering (EE) Department as a pass receiver. Jim was the quarterback for our team, which was named the Static Charges.

The most impressive member of our team by far was Ed Karcher. He was then a grad student in our EE class, but, the previous year, he was a star 180-lb guard on the Tech varsity team called the Tartans. When the football was snapped to Jim, I saw Ed's amazing speed. He kept the other team's players far away so Jim could throw his passes.

I don't remember much more about the game except for a play where I ran far down the field to receive a pass from Jim. The football was sailing pretty far over my head, so I stopped running. Jim yelled at me to keep running until the play was over. It was a good demonstration of Jim's passion and his desire to win, which were evident throughout his career.

While my work at IBM on scaling was underway, I visited Jim's group at Stanford University frequently in the summer to talk to him, Jim Plummer, and their graduate students. I gave lectures on my scaling papers, acknowledging a very important 1972 paper by Swanson and Meindl, that models metal–oxide semiconductor transistor operation in the weak inversion region near turn-on. I also did some recruiting and was happy to hire Nicky Lu to work with me on high-speed DRAM. He went on to found his own company, Etron, and should be counted as one of Meindl's many very successful students.

Jim Meindl was a very dear friend of mine and will be greatly missed. I join you all in honoring his outstanding career.

—Robert H. Dennard

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About the Author

Robert H. Dennard is an IBM Fellow Emeritus at the IBM Thomas J. Watson Research Center, Yorktown Heights, New York, where he was involved in microelectronics research and development from its early days. In 1967, he invented the single-transistor dynamic memory cell (DRAM) used in most computers today and, with coworkers, developed the concept of MOSFET scaling in 1972. He is a Life Fellow of IEEE and received the IEEE Medal of Honor in 2009.

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In 1988, having separated from his first start-up, Wafer Scale Integration, Eli Harari told me that he had some ideas on how to create very dense flash memory cells, which, in addition to the benefits of microelectronics, over time could possibly approach the cost per megabyte of rotating storage. Although the prospect of financing a memory company was daunting, I encouraged Eli to take residence in our offices, Concord Partners, the venture capital arm of Dillon Read and Co., and develop his concept. He accepted the offer and went to work.

After a few months, he had come up with some simulations and emulations and was at a point where he required funds for both patent applications and, because he was receiving no compensation, groceries. I figured that if we were going to seed a memory company, with its attendant long gestation time and ultimate dedicated manufacturing requirement, we had better be pretty sure that we had something special.

I had met Jim Meindl several months before. As a Stanford University professor, head of the school's microelectronics lab, and one of the premier semiconductor experts in the country, if not the globe, he spoke often to various student and industry groups. I had attended one of his tutorials, and, although the science challenged my understanding, his enthusiasm and imagery enabled me to visualize all of those little electrons running around their tiny silicon platform. For a nontechnologist, the ability to mentally construct microelectronic devices in dumbed-down form made all the difference. Jim so obviously loved to teach; he had developed his own methodologies that made the science decipherable, even by the unwashed. We spent some time together and became acquainted.

In the meantime, my partners and I listened to Eli's pitch, and we decided to seed the start-up with US$250,000, dependent on whether Jim Meindl would tell us that Eli's inventions had serious technical and manufacturable viability. I called Jim and asked him to do me a big favor: listen to Eli for an hour or two, look at his data, and tell me: Is this real?

Jim had a lot on his plate at the time, but, graciously (graciousness was one of his most compelling attributes) and despite his skepticism that the claimed device attributes could be achieved, he agreed to spend an hour or so with Eli. Well, anyone who has consorted with technologists knows that when a couple of them get together and start gnawing on a bone, clocks have no place. Eli and Jim spent most of the day together, after which Jim told me that Eli really had something, that this could not be a socket flash (it required an external controller), and that it would take time to commercialize because it had to create dedicated sockets, but that the design, capacities, performance, and manufacturability were indeed possible.

I had almost hoped that Jim would have killed the idea because the notion of starting a memory company from scratch was almost crazy. I said, "Jim, if you are so positive about this, will you agree to become chairman of the company's technology committee?"

Without asking for compensation of any kind, he said yes. Concord invested US$250,000, and SunDisk (which, a few years later, at Sun Microsytems's urging, became SanDisk) was born. Jim did indeed chair the company's technology committee and served on its board of directors for two decades. About 25 years after Jim said yes, SanDisk was acquired by Western Digital Corporation for a bit more than US$19 billion.

—Irwin Federman

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About the Author

Irwin Federman is a senior advisor with and, from 1990 until 2015, was a general partner of U.S. Venture Partners (USVP), a 35-year-old Silicon Valley early-stage technology and health-care venture capital partnership. Prior to joining USVP, he was a managing director of Dillon Read & Co., a 100+-year-old investment banking firm, and was a partner in Dillon Read's venture capital arm, Concord Partners.