



Atop Mt. Intel

David Perlmutter, who rose to become the most senior Israeli corporate executive, shares his insights on implementing radical innovation at very big companies

I'VE CLIMBED two mountains, both of whose names start with “K” – Kilimanjaro, in Tanzania, almost 20,000 feet high, and Kazbek, in the Caucasus in Georgia, 16,500 feet high.

Many succeed in climbing “Kili” because you don’t actually mountain climb, you just walk up a steep trail to the top where a lovely glacier, now rapidly disappearing due to global warming, and a stunning sunrise greet you. But climbing to the top of a great corporation is a different story.

Intel Corp. is a US-based global company that makes about 80 percent of the world’s microprocessors used in PCs and laptops. It has net income of almost \$10 billion and its shares have a market value of \$173 billion. Intel Israel, headed by Intel Corp. Vice President Mooly Eden, employs some 8,000 people directly, who generate about 17,000 additional jobs (suppliers, etc.). Intel Israel accounts for a fifth of the country’s high-tech exports, mostly from its Kiryat Gat semiconductor plant.

Very few have reached the top of Mt. Intel’s corporate ladder. One who did is David (Dadi) Perlmutter, who rose to become the most senior Israeli executive at a huge multinational.

Perlmutter retired in February as Intel’s Executive Vice-President, General Manager of Intel Architecture Group and Chief Product Officer after a 34-year career. In this capacity, he had a major role in expanding the

business from \$35 billion to \$50 billion in revenues and the payroll growing to 35,000 (about the population of Pardes Hanna). He was well liked at Intel, and when he toured the world to say good-bye to company workers, some stood in line for an hour to shake his hand.

I interviewed him at length on several occasions to explore how to implement radical innovation in very big companies. Perlmutter did this at Intel at least twice. The first time led to Intel’s hugely successful Pentium; the second created the global hit chipset known as Centrino.

Former IBM CEO Lou Gerstner’s 2002 book, “Who Says Elephants Can’t Dance,” describes how Gerstner restored giant IBM’s creativity, when he took over in 1993. But this instance is actually quite rare. Many big companies strangle creativity both with their size and their bureaucracy – before Gerstner, IBM’s hierarchy ladder required 18 signatures to implement an idea.

The proof that elephant companies can’t dance is the huge sums they spend to acquire small innovative start-ups just for their ideas. Intel itself has made a dozen acquisitions in the past five years of which \$2.5 billion were led by Perlmutter.

What is life like in the rarified air atop Mt. Intel, headquartered in Santa Clara, California, in Silicon Valley? How did Perlmutter get there? What can Israeli managers learn from Perlmutter’s 34-year adventure? And

how did he get giant Intel to samba, twice? Here is what I learned.

Chutzpa and the Pentium

Perlmutter joined Intel (Israel) in 1980 after serving in the IDF as a paratrooper and graduating in electrical engineering from Haifa’s Technion Institute of Technology. In the early 1980s he helped lead development of an important Intel product, the i387 math co-processor, a product that put Intel’s Israeli developers on the map. But he earned his spurs in late 1989 with a bottom-up innovation.

Perlmutter: “Innovation is not necessarily creating something radically new but, sometimes, improving significantly something that already exists. In the 1980s, Intel was very successful with the x86 microprocessors, which used CISC – complex instruction-set computing technology. But a new technology emerged, known as reduced instruction-set computing (RISC), and Intel senior management decided to adopt it.

“In Israel, we were assigned to do a minor improvement in an existing microprocessor, the 486. After a six-month study, we decided we could do a major improvement. We felt it was a mistake to abandon CISC because it meant PC users would lose ‘backward com-

David Perlmutter speaks at the 2008 Intel Developer Forum in Shanghai

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patibility.’ That means PC owners would be unable to use a decade’s worth of software compatible with CISC and Intel’s x86. With RISC, instead of Intel being ahead of everyone, we felt Intel would lose a significant business advantage.

“Uri Weiser was recruited from National Semiconductor. He and I decided to convince Intel senior management, including CEO Andy Grove, that they were wrong. We formed a team, made the case for improving the 486 rather than shifting to RISC, and sent a long fax to the CEO. On the cover, we drew a picture of a goose that laid golden eggs (the x86), which, we claimed, Intel was about to kill.

“Andy Grove could easily have shredded the fax and commented acidly on the impudent Israelis who sent it. But, instead, he chose to listen. So we travelled to Intel headquarters in Santa Clara and made the case. Over a period of several months, Uri and I gave a series of talks on the new proposed microprocessor architecture, called the P5 (later, Pentium). Intel’s technology experts said what we proposed was impossible. However, eventually, Intel decided to design and produce the Pentium and retain CISC. But there was also bitter disappointment. We at Intel Israel did not get the job of designing the Pentium. Part of the task of persuading Intel was to agree that Intel developers in the US would get the job.

“I am a rather shy person. I remember once bringing my little brother with me to borrow a cup of sugar from the neighbor because I was too shy to do so on my own. How did we have the courage to approach the ‘top of the mountain’? Well, the worst case was we would be ignored. The lesson here is always listen to those below you. Andy Grove did.”

The Pentium microprocessor was a big hit and helped Intel retain its market leadership for many years. But, in the dynamic semiconductor market, you can never rest on your laurels. The next challenge came very soon.

Centrino and the big U-turn

On the high seas, a supertanker takes a full five miles to come to a full stop, and to make a U-turn it needs two whole miles. Intel and most big companies are like supertankers; once a direction is set, especially a successful one, they’re very hard to turn around. Perlmutter succeeded.

Perlmutter: “When work began on the Pentium, I was offered a senior position at an Intel site in Oregon, and I took my wife

and children to the US for three years. We returned home at the end of the 1990s. In Israel, I led a project to develop a low-cost microprocessor (“Timna”) that would be used to make inexpensive PCs, selling for under \$1,000. We produced Timna, but the project failed. Intel marketing said that I picked a technology that failed to reach its price target. This was a great blow to our Intel developers in Israel. But the failure eventually turned into success.

SOMETIMES INNOVATION INVOLVES IMPROVING SIGNIFICANTLY SOMETHING THAT ALREADY EXISTS

“The marketing people at Intel had a great idea. How do you sell the complex technology of a microprocessor? [Intel sold only to manufacturers, but devised a brilliant “Intel inside” branding strategy for PC consumers.] Simple. You simplify. You sell “megahertz,” a measure of the speed of a microprocessor, and you sell “more speed (megahertz) is better than less.” Few people know who Hertz was (Heinrich Hertz was the scientist who proved the existence of electromagnetic waves) but they understood that more is better than less, and faster microprocessors are better than slower ones. So, for years, Intel marketed its microprocessors by selling this one number, megahertz. Frankly, this was genius.

“In working on the Timna microprocessor, in Israel, we made a discovery. We did a debrief on Timna and, instead of debating what went wrong, we also asked what went right? We had learned a key fact – if we reduced the cycles per second (megahertz) by 10 percent, we could reduce the area of silicon required by the microprocessor by fully half! Now, Intel sells millimeters of silicon. So, if you lower the area of silicon, you lower costs and increase profitability. We decided that rather than discard all the creativity emerging from Timna we could utilize it.

“At the time, laptops had only 10 percent of the PC market. The problem was short battery life. This was why the world then still used desktop computers rather than

laptops. We decided we could extend laptop battery life and make laptops far more useful by making smaller microprocessors that used less power. This meant you could use your laptop without charging its battery for several hours. But there was a problem. Intel was still selling megahertz. Our chip was 150 megahertz, rather than 200. A big U-turn was needed. And marketing had a big say within Intel.

“I made a presentation to senior management. It was quite dramatic. I had two choices. One was to leave the ‘detail’ of lower megahertz to the very end and to make the pitch for cheaper, smaller microprocessors, longer battery life, “unwire your world.” A second was to say, up front, at the start, our proposed chip is slower, with less megahertz. I chose the latter.

“At that point, the marketing people said I should stop right there. No point to go on; it would be a waste of time. Paul Otellini, at the time head of Intel Architecture Group, asked the laptop division, can you sell this product? They said, well, we don’t quite know how, but we support this idea and, besides, IBM is a client for it. So let’s go for it. Otellini told me to go on, and I continued with my presentation. The result was the Centrino chipset, designed at Intel Israel.

“The key was in creating real value for our customers and in explaining how and why we did so. We succeeded in convincing Starbucks and Hilton Hotels to introduce Wi-Fi hotspots, so people could connect to the Internet with their laptops. There was a big Intel advertising campaign. The Centrino sold for a market price higher than the faster desktop microprocessors. It was a big success.”

Redeployment

Last June, Perlmutter spoke to a group of senior managers at Technion’s Innovation Forum, created by Prof. Miriam Erez and Dr. Iris Arbel. He was peppered with questions about his climb to the top of Mt. Intel. One of them related to redeployment.

On three occasions, during three separate decades, Perlmutter moved his wife and children to the US to take on management challenges. Perlmutter praised his wife, an innovative educator who was principal of Haifa’s Urim School for children with behavioral problems, and her willingness to live abroad, including one move when she was pregnant. Many Israeli managers understandably decline redeployment, but it seems essential if they are to reach



Intel's offices in Petah Tikva: Intel Israel accounts for a fifth of the country's high-tech exports

senior corporate positions.

On seeking bad news

Workers like to joke that the higher you climb in a company, the thinner the air and the harder it is to support intelligent life. One real consequence of being a corporate executive is the higher you rise, the harder it is to get accurate information. Messengers fear that bringing bad news brings retribution.

Mike Mullen, former head of the US Joint Chiefs of Staff, was told by a friend just before he took office that this was the last time anyone would tell him the truth. As a result, he spent his time as America's top soldier by travelling widely, talking to the rank-and-file and building his own picture. I asked Perlmutter about how he got people to tell him the truth atop Mt. Intel.

"Not every problem should be brought to the boss," he said. "You need a filter. I wanted to hear about problems only when they shifted from local to global or became complex and needed an organization-wide solution. The two cases when senior management must hear about problems are when large resources are needed to solve them or when commitments to clients are involved." Perlmutter said he often got accurate in-

formation from those with whom he had worked closely on his way to the top and earned their trust. They rarely misled him.

Dealing with product flaws

Perlmutter recounted an instance in 1994-5 when Lynchburg College Prof. Thomas Nicely discovered that, once in nine billion calculations, the Pentium floating point unit gave wrong results. This was widely publicized. Despite the extreme rarity of the errors, Intel invested \$500 million to recall and replace every one of the microprocessors.

"It was good that Intel acted thus," Perlmutter said. "The return on investment for Intel was worthwhile."

On work-life balance

"If, as a corporate executive, you answer emails on weekends," Perlmutter said, "then so must all your workers. This is bad for everyone. Your wife and kids ask whether you are really there when you are with them. So, my policy was on weekends, no emails."

On failing to reach the summit

I failed to reach the summit of Mt.

Kazbek. A freak July snowstorm, freezing cold, exhaustion, and the effects of altitude kept me in my sleeping bag while my two sons made the attempt with our guides.

Perlmutter did not quite reach the summit of Mt. Intel to become CEO. Last April, he explained why to the business daily *Calcalist*. CEOs are always appointed by the Board of Directors. Perlmutter feels, perhaps, he did not sufficiently explain his vision for Intel to the board. His vision was "beyond silicon" – developing a wide range of products (software, 'wearables,' Internet) in addition to microprocessors. In the end, Brian M. Krzanich, who ran operations, got the nod.

Today, Perlmutter is a board member of Mellanox Technologies, an Israeli firm founded by Eyal Waldman that accelerates data transfer. He is also assisting Leonid Backman to develop his Israel Innovation Center.

And somewhere, perhaps, an innovative Israeli is making his or her way to the top of another global multinational mountaintop. ■

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