BME CAPITAL MANAGEMENT

Should your next CEO be a Philosopher?

By Dr. Gideon Tolkowsky

What differentiates a winning company from an also-ran? For many analysts and investors, the answer involves technology, which increasingly permeates every step of a business's operations. But according to a Wharton professor and an Israeli venture capitalist, a company's ability to understand its customers' philosophical outlook may be as vital to its success as R&D and other efforts.

"Technology is no longer an exclusive focus of companies like IBM or Microsoft. Instead, technology is also on its way to becoming the core asset of consumer goods companies like Wal-Mart and, in fact, of any company," says Gideon Tolkowsky, principal of BME Capital. "But this brings us to a metaphysical question: What is the meaning of technology? For example, a personal computer can be regarded as a communication tool by a business executive, as an educational tool by a teacher and as a toy by a child. Different meanings to a given technology can co-exist, or replace one another sequentially. As more companies operate in a global environment, they will need to do more than simply ask whether the technological state-of-the art enables the development of a given product. They will instead have to consider what the technology means to each segment of the market and accordingly, how to position the technology-based product."

He adds that although it's a given that technological assets can determine the progress of an individual, a company or even a nation, the decision to embrace or to reject technology is itself deeply affected by abstract ideas that are embedded in an individual's (or a nation's) general life philosophy.

"The field of the philosophy of technology is relatively young," says Tolkowsky. "It was founded on the stipulation that technological change is a driver of historical processes, but newer theories challenged this deterministic approach and advocated a reverse direction of the causal arrow, namely -- that it is social change that triggers technological innovation."

Finally, he says, the two approaches were synthesized in a theory of "technological momentum" that differentiates between different phases in the life cycle of a given technology. "This theory stipulates that at the early, formative stage, a given field of technological innovation is shaped by its social environment. However, as the field matures, it loses its sensitivity to the external social forces and becomes driven primarily by technological considerations," notes Tolkowsky. "But the available theories neglect the role of abstract beliefs in the shaping of technology life cycles. Bringing the concept of metaphysics (a branch of philosophy concerned with the the abstract, non-physical principles that govern the universe) into the discussion can provide a new look at the resulting, practical implications of the interaction between society and technology."

The First Gliders

As a historical example, Tolkowsky points out that 19th century Europe had all it took to become the home of the first powered flight -- but it didn't. "By 1810 the British country gentleman George Cayley had built a working glider, and by the 1890s a German, Otto Lilienthal, had completed more than a thousand daring flights in full-size gliders," says Tolkowsky. "Yet mainstream European science turned its back to the prospect of aviation and it was a pair of Americans, the Wright brothers, who took the lead in powered flight."

Tolkowsky suggests that Europeans saw air flight as a threat to the established social order. If people could fly, what would become of state sovereignty? The socially structured Europe couldn't bear this thought. It took a couple of American boys, living in an unstructured frontier society, to shed an unyielding philosophy that blocked a technological leap.

That kind of missed opportunity could still occur today in an increasingly global economy, says Wharton marketing professor Yoram "Jerry" Wind, director of Wharton's SEI Center for Advanced Studies in Management. "The decision to introduce an invention involves a lot of work on many dimensions, including an examination of the market's belief system. In the U.S., for example, the acceptance of genetically modified foods is much greater than it is in the European Union."

Innovators as well as users of technology often ignore or even deny the technology-metaphysics link, according to Tolkowsky. "While the art of marketing does make some room for customers' abstract conceptions, the art of engineering does not. It is generally assumed that the application of science to real-life needs is driven by tangible forces or, at best, by social structures and processes. But the history of technology -- early and modern -- tells a different story, which holds important lessons for the future."

He explains that designers, manufacturers, sellers, managers of technology and, importantly, its users, should seek to comprehend the metaphysical foundations of technological change, since "understanding yields intelligent choices and enables implementation." The same holds true for investing in technology-intensive companies, he adds. "Among other criteria, an investor must also look at how a company interprets its technological assets and adapts to changing belief systems around it."

For Tolkowsky, the global marketplace presents a paradox. On the one hand, speedy and inexpensive communications channels like the Internet are shattering time-distance barriers and enabling disparate cultures to engage in a way that was perhaps never before possible. But he also advises companies to distinguish between interplay and homogeneity.

"Corporations tend to assume that cultures are melding together thanks to globalization, but then they're surprised to encounter resistance," he says. "One clue was the year 2000 celebrations, which emphasized national and local identity, not a global identity. The value of global sales continues to grow, and companies that develop technological products without

considering the meaning of the technology to their global customers, based on the customers' value systems, will lose out on an increasing number of opportunities."

A Lap-top Technology Generation

He says this cause-and-effect system holds true for younger, technology-versed consumers just as much as it does for the older generation. "The fact that the latest generation, unlike the Baby Boomers, is growing up with technology in its lap makes it even more sensitive to variations in meanings of technology and in the belief systems that govern them," says Tolkowsky. "The problem is that technological advance is usually left to engineers, who have a tendency to think that everything they do is deterministic; if the science lets them do something they do it. But the challenges they engage and the solutions they seek are impacted by beliefs too -- their own, and those of their end users -- not just by the science. R&D teams should include psychologists, sociologists, artists or other professionals from the humanities, and should increasingly involve the customers themselves. Lead users, for example, are often an integral part of the new product development process. Belief management must be part of technology management. R&D myopias are just as common as marketing myopias."

Wind, who has previously noted that erroneous market preconceptions lead companies to ignore about 86% of the world's population, says that the current "go or no-go" decision to pursue innovation involves two preliminary steps. "First, the inventors and management decide whether it's viable to move forward," he says. "Then stakeholders vote -- consumers by their adoption decisions, and investors through such proxies as the stock price -- on the validity of the strategy."

The 'Starbucks Experience'

Wind says that bringing cultural and other considerations to bear on the decision-making process adds a valuable third dimension. He notes that the experience of Starbucks Coffee Company provides a useful example of the way that such a strategy works.

"Starbucks exhibited an understanding of a cultural component, a cup of coffee, and successfully created the 'Starbucks experience' with its designer coffee that was offered at a premium price," he says. "Successful companies can either adapt to or modify existing cultural beliefs, create new ones, or fail. The difference between the successful ones and the ones who fail can often be traced to their 'mental model,' or their perception of the cultural influences that affect their target markets."

Tolkowsky suggests that the notion of "corporate culture" unavoidably includes the manner in which the corporation interprets the meanings of its technological assets. Executives today realize that one of the most challenging facets of their job is to manage corporate culture. But, argues Tolkowsky, "they should be aware that managing corporate culture includes the art of 'belief management.'"

He gives an example of one company that was a world leader in computer graphics for the advertising and publishing industries, but missed out on the potential for PC-based desktop publishing. This myopia, he says, came not just from the company's marketing department but primarily from R&D. The company ended up being acquired for a low price by an up and coming desktop publishing startup.

Another example of beliefs that may impact an emerging technological industry is nanotechnology. Among other promises this field makes is that of 'nano-robots' that will flow around the human body, diagnosing and fixing clinical problems.

"But will the public accept this new breed of medicine -- where decision-making intelligent agents roam through the human body and take action?" asks Tolkowsky. "Will people embrace it or will they fear that they are losing the sovereignty of free will over their own body?"

With similar concerns in mind, *Knowledge@Wharton* asked Tolkowsky to review two of the products highlighted in *Time* Magazine's year-end "Coolest Inventions of 2004" issue. One was a robot produced by JVC. While the eight-inch high Bluetooth-controlled JV4 may not be quite up to the standards of the positronic marvels of *I Robot*, it is reported to walk on two legs with a "smooth, natural gait" and, according to the magazine's write-up, can even kick a soccer ball.

"Presumably, *Time's* editors thought that this development would facilitate the fabrication of robots that will be widely used, be it in or outside the home, and that one of their main attractions will be their resemblance to humans," says Tolkowsky. "This assumption is based on the belief that people want robots to look and act like them. It is the belief that one of the current barriers to wider use of robots is their non-human appearance and function."

But he says this belief may or may not be true, and notes that companies will have to test it prior to making the required investment. "Will a human-looking robot scare people, especially children?" asks Tolkowsky. "Will people's sense of control -- over the machine and over everyday tasks -- be threatened by such robots? Will these robots enhance the human fear of becoming dispensable?"

He characterizes the field of robotics as a "minefield" of potential psychological and sociological inhibitions, and suggests that while robots offer potential productivity gains and quality of life improvements, they also pose a wide variety of real and perceived threats.

"The designers of robotic products must weigh in advance not only the technological feasibility of their products, or their intended functionality, but also the belief systems that generally guide prospective users in their work and leisure," explains Tolkowsky. "The makers of the 'erect-walking robot,' for example, must integrate into their product management programs those functions that involve identification, analysis and testing of the belief systems associated with man-robot resemblance. Otherwise, these products will stand a high chance of failure."

Laughing Gas and Rubber

Tolkowsky was also asked to consider another invention: Burt Rutan's Spaceship One, a privately financed manned rocket with a motor that runs on laughing gas and rubber, that recently won the $10 million Ansari X Prize as the first such craft to travel to space twice in a two-week period.

Comparing Rutan's space vehicle to such NASA flagship projects as the ill-fated Space Shuttle, the Hubble Space Telescope, the International Space Station and various unmanned probes, Tolkowsky notes that the NASA efforts have been undertaken with the goal of gathering scientific knowledge, while Rutan's space project aims at making space accessible to as many people as possible.

"Space, in the Agency's eyes, is a vast scientific laboratory," says Tolkowsky. The underlying assumption is that the key to harnessing public support to NASA's activities -- be it political support, financial or moral -- is in appealing to the public's scientific curiosity. But evidently, this paradigm is false. The U.S. space program has been faltering ever since the first landing on the moon in 1969. Public support just isn't there. In contrast, Rutan appeals to the human sense of play. If space becomes accessible to people, and if it turns out to be fun to fly to space, then public support will follow."

Accessibility to space is a function of several factors, the main ones being cost, safety and qualifications that are required from the travelers. How can space become accessible to a wider group of people if each launch to space costs many millions of dollars? Or if the launch involves placing the crew on top of a huge reservoir of highly explosive fuel which is then set on fire? Or if only a select few can meet the highly demanding physical and mental requirements of astronauts -- and even the latter need to go through several years of hard training?

He notes that Rutan's project potentially removes some of the major obstacles of space travel and makes space accessible to the private business sector and to individuals. "With a relatively low ascent and descent speed, low acceleration or 'g force' during launch, and a more efficient engine that uses less fuel, Rutan's vehicle is inherently less prone to disasters," according to Tolkowsky. "Similarly, the lower g force and slower flight together reduce the physical fitness requirements from the crew as well as their overall flight skills."

Essentially, adds Tolkowsky, NASA believes that space flight will thrive if more exciting scientific findings are brought over from space. In contrast, Rutan and others in the private sector believe that space flight will thrive if space becomes more accessible to a wider group of people.

"Under Rutan's approach, space missions will become justifiable just for the fun of it," says Tolkowsky. "If the early history of atmospheric aviation is any indication, then the fun of flying is a much more effective accelerator of public interest than the prospect of scientific knowledge.

Like the Wright brothers versus the Europeans, this is a very clear example of different belief systems that lead to different choices of technologies and missions."

The historical landscape is littered with examples of species that perished because they could not adapt to a changing environment. Companies too, tend to disappear if they resist change, notes Wind.

"It will likely be some time before businesses recognize and implement a metaphysical mindset," he says. "For a long time, companies were able to thrive by serving a limited market. That is no longer the case. Today, the best companies are the ones that succeed on a global scale, but achieving that success involves understanding the beliefs and values of their global customers."

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