



**Leadership, Innovation and Entrepreneurship
in Eastern Europe, Russia and Beyond**

**Лідерство, інновації та підприємництво
у Східній Європі, Росії та інших країнах**

Leadership, Innovation and Entrepreneurship in Eastern Europe, Russia and Beyond



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332 Steinberg Hall-Dietrich Hall
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of the Ukrainian Catholic University
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Introduction

The world economy has gone through difficult times in recent years with low economic growth. Companies and governments have strongly focused on restructuring. Cost-cutting and efficiency gains have now largely been exhausted in most industries, prompting business leaders to turn to innovation to provide the impetus for further growth. As all progressive CEOs will agree, ideas and innovation are the most precious currency in today's global, knowledge-based economy.

Innovation offers the only recourse to companies that want to overcome the curse of products and services being commoditized, and which want to build, lead and sustain the creation of value for their customers, employees, stockowners and other stakeholders.

Although innovation ranks high on the global agenda – in both the public and corporate sectors – regional differences do exist. Emerging markets do not always recognize the opportunities and challenges to innovate in ways that could make them globally competitive. As a result, emerging markets sometimes lag behind the developed economies in recognizing and implementing innovative solutions and practices.

In a small effort to correct this imbalance, Lviv Business School of the Ukrainian Catholic University (LvBS) has teamed up with Knowledge@Wharton (<http://knowledge.wharton.upenn.edu>), the online research and business analysis journal of the Wharton School of the University of Pennsylvania. Together we have selected for publication as an e-book 15 articles about leadership, innovation and entrepreneurship in Eastern Europe, Russia and beyond. Drawn from some of the most engaging articles and interviews that have appeared in Knowledge@Wharton, this e-book offers insights that will open your mind. We hope reading these articles will spark breakthrough ideas and strategies that innovative companies can implement in the face of changing markets, technologies, and consumer demand. The e-book is available in 3 languages: English, Russian and Ukrainian.

This collection will help you learn about a new generation of entrepreneurs that is emerging in Eastern Europe, as well as companies that were forced to innovate out of necessity during the depths of the economic downturn. A number of articles deal with entrepreneurship and innovation in the so-called BRIC (Brazil, Russia, India, China) countries. You will also read about the organizational culture of innovations – e.g. how group dynamics may be killing innovation. We have adopted a multidisciplinary approach and featured stories from different industries, such as telecommunications, finance and banking, automobiles and education. In addition to the BRIC nations, companies from Eastern Europe, the Middle East, and Africa have also been included.

We hope these stories will inspire you and your management team to launch your own initiatives to build value through imagination, creativity and innovation. And when you do, we hope you will reach out and let us know.

Enjoy!

Sophia Opatska

CEO

Lviv Business School of UCU

www.lvbs.com.ua

Mukul Pandya

Executive Director, Knowledge@Wharton

Wharton School of the University of Pennsylvania

<http://knowledge.wharton.upenn.edu>

A New Generation of Entrepreneurs Emerges in Eastern Europe

Though this is not widely known, Skype's initial development team was based in Estonia. And Ukraine is where PayPal's co-founder Max Levchin grew up. Little wonder, then, that global investors are starting to pay careful attention to innovation and entrepreneurship in Eastern Europe, Ukraine and Russia.

Consider venture capitalist Tim Draper, founder of Draper Fisher Jurvetson (DFJ), who reaped huge returns after making a personal investment in Skype in 2002. In 2004, he worked with American-Ukrainian investor Roman Kyzyk to launch DFJ Nexus, the country's first technological venture fund investing in innovations sourced in Ukraine, Russia and Eastern Europe. The firm planned to invest in a range of companies from research and development of algorithmic trading, biotech companies focusing on new methods for treatment of leukemia, and alternative energy and battery storage. Despite Ukraine's Orange Revolution, strong leadership failed to bring all the needed legal reforms and Soviet style bureaucracy and corruption continued to prevail. After two years, Kyzyk who was managing the fund in Ukraine's capital city of Kyiv, discovered many of their local partners had been conducting fraudulent behavior and decided to pull out.

Despite losing millions, Kyzyk remains bullish on the region and points out that several foreign investors have profited from their investments. He explains that many of his fund's troubles stemmed from not conducting enough due diligence. Kyzyk advises potential investors to build a process of "scaffolding performance" and demanding adherence to clean business practices and validating what takes place prior to entering a sharing or partnership agreement. "Once you have extended legal partnership relationships, it is incredibly complex to unwind," he adds. He also recommends conducting deep due diligence to investigate people under consideration for partnership. Kyzyk says while major return on investments are possible, investors should be prepared for a marathon rather than a sprint.

Kyzyk is hardly alone in his guarded optimism. Russian businessman Alexey Bochkarev says the entrepreneurial spirit and talent among those wanting to start a business in Russia is so strong, he is considering establishing a U.S.-Russia business incubator. Like many U.S. -- and European -- educated investment professionals and entrepreneurs, he is eager to go back to Russia and start a business.

With Internet penetration growing rapidly in many Eastern European countries, especially in Russia, Bochkarev expects the e-commerce industry to explode in the coming years. Among the several companies he has worked with is e-commerce site Lamoda (www.lamoda.ru), which is similar to the U.S.-based Zappos, an online retailer of shoes. He is also involved with two other companies, a global dating platform called WikiDates (www.wikidates.ru) and an online education platform that aims to empower teachers and students with additional learning tools developed by fellow Russian entrepreneur and Wharton alum Denis Zaviyalov. While many ideas are unique, Bochkarev expects entrepreneurs in Eastern Europe to copy successful e-commerce business models that have proven successful in the U.S. and Europe. "The reason is simple: Why invent something if you can just build another Zappos?" he asks.

In this global age, Bochkarev says many Russian entrepreneurs prefer to raise funds from well-known American and European venture capital firms. This is because the support of reputable investors helps build the attractiveness of their businesses that can help in future funding rounds. Prominent VC firms such as Accel, Bessemer, Mangrove, Sumitomo, Tencent and European Founders have recently invested in Russian companies. "If you have a good idea and a great team in place, you will definitely raise funding. When people think of raising funds, they have quite a few options: sovereign funding, private equity or venture capital funding, and business angels often played by oligarchs in Russia," he says. Still, relatively speaking, the level of venture capital investments in Russia is low. For example, from 1999 to 2007 foreign venture capitalist investment in Russia has been \$300 million. According to Ernst & Young, that's less than venture capitalists invested in China during the first quarter of 2007 alone.

Even in former Soviet states such as Uzbekistan where Internet penetration is low, entrepreneurs like Ulugbek Baymuradov are finding business opportunities. The Stanford graduate founded BekList, an SMS (short message service) marketplace where buyers and sellers can find each other with a single text message. Baymuradov was inspired by reports in *The Economist* newspaper that mentioned SMS services being used to combat drug counterfeiting in Ghana and Asian farmers receiving daily messages on the prices of agricultural goods, so they know when to take their harvest to market.

"I knew that both these services would be useful in Uzbekistan, but I wanted to make something sophisticated and valuable in the back end, and yet provide a simple and easy user experience," says Baymuradov. Through BekList, sellers can send text messages on what they are selling and their location. Buyers can search for a product by sending text messages about what they want to buy and the BekList will respond with text messages about products and sellers nearest to the buyer.

According to Baymuradov, BekList's main innovation is in combining technologies to solve a host of market problems and inefficiencies in places where Google, Amazon, Craigslist or eBay do not have a presence, such as with buying, selling or renting space. For example, he says one could easily spend days looking for houses to rent, knocking on doors to ask if their apartments are available. Baymuradov hopes that when BekList is launched, such information will be readily available to anyone no matter how "dumb" their phones are.

In European Union states such as Hungary, the Czech Republic and Poland, entrepreneurship exploded in the 1990s, recalls Natalia Olson-Urtecho, who spent years in the region working on the NATO and EU accession programs. For example, young entrepreneurs made fortunes from several businesses including bringing refrigeration systems to the region as seafood restaurants became popular. One entrepreneur traveled to Italy and helped bring Vespa scooters into Hungary, while another found success convincing magazines in Western Europe to create Hungarian and Polish versions.

Many have benefited from the EU which has provided funding to support innovation and entrepreneurs in its Eastern European countries. Unlike institutions in Ukraine and Russia, EU states in Eastern Europe have been forced to adhere to a checks-and-balance system. Olson-Urtecho also credits the initiatives by the U.S. in setting up training centers in Central Europe on border issues and trafficking for helping boost the entrepreneurial environment in the region. "People didn't have to pay bills to the mafia and deal with them as they do in Ukraine and Russia," she says. She also gives credit to the Hungarian-born billionaire George Soros for founding the Central European University in the early 1990s. With the plentiful supply of scientists in the region, she hopes people like Soros will help draw more

funds to support industries there such as medical research and biotechnology. Olson-Urtecho was recently nominated by U.S. Commerce Secretary Gary Locke to the newly established U.S. Innovation Advisory Board.

Russia: Still the Wild West?

In Russia, President Dmitry Medvedev is eager to diversify his country's economy, which has hitherto been most recognized for its commodities and natural resources. Russia's GDP has grown from \$345b in 2002 to \$1.2 trillion in 2009 which has resulted in an influx of entrepreneurs. The country has invested billions into Skolkovo, also known as Russian's Silicon Valley, just outside of Moscow. Plans call for Skolkovo to become a research and innovation center for energy, IT, telecommunications, biomedicine and nuclear technologies. IT giant Cisco has already committed US\$1 billion to Skolkovo, putting it in the company of other corporations such as Intel, Microsoft, Siemens and Nokia.

Russia received positive press last year when PepsiCo spent US\$3.8 billion to acquire 66% of Russian company Wimm-Bill-Dann Dairy and Juice Co. With this acquisition, Russia became PepsiCo's largest market outside the United States. Another success story is the search engine Yandex.ru that more than 50% of Internet users in Russia prefer over Google. Russian investors such as Yuri Milner, founder of Digital Sky Technologies, has also become well known after his firm invested in companies such as Facebook, Twitter and Groupon.

However, with good press comes bad. Take for instance software tycoon Eugene Kaspersky of Moscow-based Kaspersky Lab, whose son was recently released after being kidnapped for five days. The country still suffers from a weak rule of law. Transparency International ranked Russia 154th out of 178 in its 2010 Corruption Perceptions Index, surpassing even Libya, Cote d'Ivoire (Ivory Coast) and Haiti (all ranked 146th).

Follow the Money

Over the past three years, Russia has attracted US\$1.4 billion in private equity investment -- a bleak figure compared to other BRIC (the group of Brazil, Russia, India and China) countries. According to Emerging Market Private Equity Association of Washington, D.C., in the same period China attracted US\$28.6 billion, India US\$15 billion and Brazil US\$5 billion.

Earlier this year President Medvedev announced the restructuring of Rusnano (Russian Nanotechnology Corp.), a \$10 billion venture capital fund specializing in investments in nanotechnologies. Medvedev has also turned to executives from the Blackstone Group, Goldman Sachs and JPMorgan Chase to create a working group to help turn Moscow into a global financial center. Credit Suisse is also working with state-owned OAO Sberbank, Russia's largest bank, in raising a US\$1-billion dollar private equity fund.

With the current government backing initiatives such as Skolkovo and Rusnano, entrepreneurial activity in Russia is getting a boost, says Bochkarev. But many concerns persist. "Still, given the bureaucracy and various limitations and risks which continue to exist for small businesses, many don't survive even the first months of existence," he says.

George Elfond, founder of the Emerging Market Private Equity Conference (EMPEC) in Beverly Hills, CA, believes the Russian government is committed to developing high technologies and is ready to learn from its past mistakes. Elfond started a company to advise private equity funds and institutional investors wanting to start operations in Russia and other former Soviet states. He organized the country's largest private equity

conference starting in 2006. At this conference, the Russian government announced the formation of a US\$1.25 billion venture capital fund-of-funds. While Elfond says it was a brilliant program on paper, it didn't work as expected because of misperceptions between the government and fund managers, among other reasons.

However, Russia is learning from such experiences and filling such government posts with people who have experience in financing innovation, he says. Russia could learn also better PR techniques from other BRIC countries that have attracted more investors. China, for instance, has several investment agencies that welcome prospective foreign investors, inviting them to presentations rendered in perfect English. Elfond feels Russia's economy could benefit greatly if its bureaucracy improved its attitudes towards foreign investors.

The Drag of Bureaucracy

Max Jalandoni, a senior consultant for IBM, has worked in Ukraine and elsewhere in Eastern Europe including Russia, Siberia and Latvia on projects involving supply chain and transportation options for both large and medium-size companies in the oil & gas, mining and agricultural capital equipment industries. "The monopolistic nature of the rail systems in all of the CIS countries (Commonwealth of Independent States, the former Soviet republics) restricts the market's ability to control logistics and transportation costs, which in turn inhibits economic growth," he says. One barrier often faced is non-transparency in resolving customs-related challenges. They are often resolved through a shadow economy of alternative taxing mechanisms that has replaced outright bribery, he says. He adds that such a system seems to resolve problems quite efficiently, if you know the right parties to handle.

Russia is a difficult market, and foreigners who come with little understanding of the local culture are bound to fail. Entrepreneurs like Bochkarev see the country as a great school for global investors. If they can succeed in doing business here, they'll be able to do it anywhere, he says. "Russian entrepreneurial culture has become one of the most creative ones in the world where you come up with unexpected solutions to problems at hand and are not afraid of doing business in any unfamiliar or risky environment," he says.

Ukraine: The China of Europe?

While Ukraine's geographical location between Europe and Russia is often portrayed as a disadvantage, some like Elfond say it could actually be a big advantage. Situated between the two markets of Europe and Russia, it is a strong hub for the Russian oil industry. It could also be a vital location to produce industrial and consumer goods if the right incentives for investors were in place.

Positioning Ukraine for such businesses is important because its industrial economy is highly dependent on discounted Russian oil and gas supplies. The country has made several concessions to Russia in exchange for reduced oil and gas prices. Those concessions include extending the presence in Ukraine of the Russian fleet until 2042, making it ineligible to enter NATO because of the presence of foreign troops.

Other areas for innovation include agriculture and tourism. Ukraine has dropped its visa requirement for EU and U.S. passport holders and as the country sets to host the UEFA European Football Championship in 2012, many foresee it as an opportunity to build its tourism industry.

With a strong education system in math and science inherited from the Soviet years, Kzyk says it's not uncommon to meet taxi drivers who are experts in quadratic equations. Major

corporations such as Boeing, IBM, and Intel have invested in R&D centers in the country. Taras Vervega co-founder of Softserve, a global provider of software services, says during the economic downturn in 2008, his company had to step out of its comfort zone to weather the storm. Vervega explains that laying off employees to get through an economic downturn is not the norm culturally. It was also the first time the software industry in Ukraine had taken such a hit. Softserve, which was recently awarded as a 2010 Industry Leader by the National Business Rating of Ukraine, took a Western style approach, cutting non-strategic investments and staff.

Vervega explains the firm made a decision to try and keep many valuable clients through offering them break-even prices for their services. The strategy worked and in the second quarter of 2009, Softserve grew by 7% and was in position to hire back more than 50% of its staff that the company had previously had to lay off. He credits the influence of his U.S. counterparts who he says were, "very good examples of how good companies in hard times should take painful decisions that are necessary and needed to overcome a crisis more easily." As one of the biggest companies in Ukraine, Vervega points out that Softserve was able to set an example for other companies to follow during the downturn.

For more businesses to open, however, the entrepreneurial environment needs to improve. Consider Nathalie Kirsanova, CEO of Softina, another Ukrainian software development company. Softina is located in the city of Kharkiv that historically was the educational, research and scientific center of the former Soviet Union, and recruiting highly skilled employees hasn't been difficult for her. But, in spite of offering lower prices compared to those in Western Europe and the U.S., Kirsanova says her business often faces challenges because of Ukraine's economic and political instability.

Kirsanova cites problems she faced when the Ukrainian government recently changed legislation that made accounting and reporting more complicated than before for small businesses. Switching from a 'fixed tax' system to more a comprehensive reporting system has almost doubled her company's tax burden. She adds that it's almost impossible to grow a business without collaboration with authorities. "The business should be 'covered' by somebody almost all the time," she explains.

More Muscle for Central and Eastern Europe

A further distance from Russia, the business environment in EU countries such as Poland, Hungary and the Czech Republic are more stable. Olson-Urtecho points to the increasing influence of Central and Eastern European countries in the EU Council. Hungarian President Pál Schmitt is president of the EU Council with the next appointment going to Polish President Bronisław Komorowski. Olson-Urtecho says that joining the EU has helped both countries benefit from improved infrastructure investment as well as implement improved environmental and quality control standards.

Olson-Urtecho would like to see more governments such as Hungary create tax incentives to capitalize on their technologies. For example, GE has opened innovation centers in BRIC countries including committing to a US\$500 million investment just outside of Rio de Janeiro. In 2006, Microsoft opened an innovation centre in Poland in cooperation with the Poznań Supercomputer-Network Centre and Poznań Polytechnic.

With the right incentives, Olson-Urtecho believes governments could draw investments from companies such as GE as well as Cargill, which have several innovation centers around the world that work with countries to improve agro-businesses. Just as in Russia, entrepreneurship in-residence, science and innovation centers are needed. "We have very good scientists but commercialization is the tough part. We're not developing as much as we could," she says.

Chapter 1: Entrepreneurship in a Global Marketplace



Russia's Best-known Investment Banker, Ruben Vardanian, on Building Trust in a Fast-moving World



Troika Dialog is the oldest and largest private investment bank in Russia, with core lines of business in capital markets, investment banking, asset management and alternative investments. Ruben Vardanian became General Director of the company in 1992, president in 1996, CEO in 1997 and chairman of the board in 2004. The company was founded in 1991. Born in Yerevan, the capital of Armenia, Vardanian graduated from Moscow State University in 1992, and completed post-graduate training with BANCA CRT in Turin, Italy, and Merrill Lynch's Emerging Markets Training Program in New York City. In 2006, he became the founding president of Moscow School of Management Skolkovo. Wharton management professors Valery Yakubovich and Michael Useem spoke with Vardanian about entrepreneurship and education in Russia. An edited version of the conversation follows.

Yakubovich: Where did Troika Dialog come from?

Ruben Vardanian: I was a student in Moscow University's economics department in 1990 when everybody realized something was going to change in our country. I said to myself, "We are changing from one system to another system. Which element are we missing?" That's when the government planning system was replaced by the financial system's markets. I said, "It's a new industry, and nobody knows what will happen and how the markets will develop, but the Russian financial industry will be like a normal international industry."

I wanted to do something around this, and my vision was very simple: Russia will become part of the global world. Foreign investors will invest in Russia. We need to find out how to provide services to them, because they need us to understand what's going on in Russia, and there are not so many people who can do that. It was not just a question of knowing English. There was also a mental difference [to explain to clients], especially in Russia in the 1990s.

I was young, and I saw I had a unique opportunity, because international businesses are built around reputation and professional skills, not around your political assets or capital assets, which I didn't have any access to at that time. I said to myself, "I can build the right company with the right vendors." This is one of the basic principles I used in the beginning.

Yakubovich: How did Troika Dialog capture that vision?

Vardanian: We put forward three principles in 1991, which continue today in our business. They are all very simple, nothing scientific. First, we said we are long-term oriented, which was quite unusual in Russia, especially at that time. For example, we are the only ones in

Russia who hired Coopers & Lybrand [now PricewaterhouseCoopers] in 1991 to perform an international audit confirming our losses in the first year. That was the kind of long-term commitment we made to ourselves and our industry. We did lots of things people did not usually do in Russia in the 1990s. We ran the company using international standards, not benchmarking ourselves against [companies] around us in Russia.

The second principle says we are a client-service company. It's unusual to explain in Russia that you are a client-service company, because client service was never a key aspect of our country; industrial production was the key.... Our proprietary position was very small [at that time], and I continued telling my people, "We are servicing the client." It's a very important point, which again, in the 1990s, was not so obvious when everything was unstable, and nobody cared about the client.

The third principle was this: I said to myself, "I want to respect myself, and I want to respect my people, my country, my competitors, my clients." So I want to build this respect, and I want people to enjoy working together. It took us a lot of effort to convince people to trust each other in business, because the level of trust in Russia in the 1990s was very low, when the old system collapsed. Building a partnership in Russia, where nobody believed in partnership, was a challenge.

I wanted to change that perception, that you can trust a 24-year-old Armenian guy and operate in a professional, international way. I think it was good motivation for all of us to try to convince people this was possible.

Useem: So having built Troika Dialog from the start, you created a skill set, but when you took over the former Soviet insurance company, Rosgosstrakh, presumably you needed a different set of leadership tools. What were the similarities and differences in the leadership styles you used for both organizations?

Vardanian: It was a very unique experience for me. This former Soviet company had 30 million clients and 100,000 employees, and the average age [of employees] was 53. The company had basically lost its market; it was close to bankruptcy and it was alive only because the government allowed it to be. It was a challenge for us, saying to ourselves and others, "We believe it can be recovered," while other people said, "There is no chance." So we had to change perceptions.

It was important to say, from the first day, what is the goal? What will be our rules of internal relationships? What will be our channels of communication? What will be our motivation and compensation system? It was very different from Troika. I will be honest; it was challenging for me to understand that the system of partnership [we used in Troika], the system of collegial consent, didn't work [in Rosgosstrakh]. It was organized much more like an army or a bureaucratic system. At Troika I have a meeting every Monday morning with all my colleagues, and we know everybody personally. At Rosgosstrakh, it was different. People worked in other regions of Russia, and they didn't know each other at all.

But what I did was the same. I travelled a lot, and I remember I went to one of the biggest cities in Siberia, Krasnoyarsk. The director there said it was the first time in the 85-year history I took the whole management team to travel around all of Russia's regions, trying to explain what we were doing and how we would do it. I remember the business planning process: It took me two months, with my management committee members spending all weekend with each region, going line by line with them. They were shocked when they saw the level of communication and commitment from our side.

The key element was committing ourselves fully to the ambition of being number one. And it happened very quickly. When I came to work with Rosgosstrakh, it had \$200 million in premium collections a year, for a company with 30 million clients. When I left in two-and-a-

half years' time, it was \$1.3 billion in premium collection. Of course the market was much more favourable then; it was a good market. But it was interesting for me to learn that even with a different system and different people, you can continue if you have a clear goal and a clear vision, and you are constantly delivering what you promised.

It is a long process: It's still not over. My partner who worked with me at the time has continued struggling to change the company, and I think he's doing great. But I see what is possible to achieve even in old Soviet-system institutions, just by building trust and constantly delivering on that trust.

Yakubovich: You said you wanted to build Troika Dialog as a clean, trust-based business, and it seems like that effort was recognized pretty quickly.

Vardanian: I think it was seven or eight years, so not very quickly.

Yakubovich: Maybe for Russian standards that is a long period, but here I think it is very fast in terms of how you managed to establish yourself. To many observers, you proved that a businessman in Russia doesn't need to be a criminal; at least, here in the West, that stereotype exists. Did you face pressure to become a criminal, and if so, what skills did you use to deal with those pressures?

Vardanian: First of all, I want to say I'm not an angel, and I live in Russia, where everything is transforming, and I have not done everything perfectly. But I am proud I have continued to live, all 17 years, without bodyguards, never fearing that my life or my family's lives are in danger. I always know I can become more transparent, more public; for example, I always pay my taxes immediately. In the 1990s that was difficult because you paid cash salaries to people. Otherwise you'd be out of the market.

What standards you set is always your choice. I remember in 1993, we didn't have too much revenue, and one of my sales people came to my office and said, "Ruben, we have a couple of clients who want to get from us a guaranteed return, around 50%." Other banks were providing 300% or 600% return at that time because there was huge inflation and everybody was promising that. But these clients were asking for only 50%. I said, "We can never guarantee a return -- even at 50%."

Looking back today, that seems easy to say, but at the time it was quite tough. We didn't know if we would have money to pay salaries at that time. But I knew it would be wrong, and I knew sooner or later we would be paid back for it. This is why you need to have a dream. You need to have a vision. You need to understand why you're saying "no." You need to understand what kind of things you will do and what kind of things you will not do.

It's very important to be honest with yourself and with your colleagues. Again, people ask me often about the mafia or the government. I can tell you: Seventeen years I've been in business in Russia, dealing with lots of cash, and we never had any people who came to us with crime, and we never had any tax police problems. Part of it is, in the early days, we didn't make too much money. Honestly, if you compare us with some of our competitors in that period, we were not very well known; we were not even number two. I think we've always looked like strange people doing strange things at the wrong time. A client once told me, "Ruben, you're a smart person, but you're doing the wrong things. Now is the time to take assets, not plan for the long-term."

It's very important to believe inside yourself that ethical behaviour will pay you back. The 1998 default was very difficult for me, not because we lost money, but because I realized how it would impact society, how people would leave Russia. You can't screw everybody and not think about the long run. It was a very difficult time for me to manage.

Useem: When you joined Troika back in 1991, you were age 22, so you did not have a lot of experience, either in Russian industry or in banking. In major Russian companies these days, I understand there is still a tendency to avoid hiring managers over age 40 because they had come of age in the state-run economy and couldn't adjust to the demands of the free market. Yet last year you hired a new bank executive director, Andrei Sharonov, who was in his 40s and had worked for most of his life for the government. Could you talk about these generation gaps and how you put people of different ages to work at Troika?

Vardanian: I started working at Troika when I was 22, and I was one of the youngest people; I think the average age then was 27, 28. Now Troika has 1,500 people working for it, but the average age continues to be 27, 28, and I am now one of the older people, close to 40.

But I believe the Troika model is still correct. I've always hired people with a high experience level. I was very lucky to get good managers. I got people who trusted me, who liked my ideas and who then brought in much more experience than I had. They came from Wall Street and McKinsey and different industries, and they have been my mentors and partners. I learned a lot by working with people with gray hair: In fact, it's a very good combination.

One of the elements of Troika's success has been multiculturalism. We always have 30 to 40 nationalities working in the local company. So we've always worked with people of different ages and cultures. One of my biggest challenges has been how to bridge the culture differences so we can accept each other and work together. Because we always had two models. One was the Russian company saying, "These Westerners don't know anything about Russia." And Westerners came to Russia saying, "We're trying to teach them, and they don't want to listen." So I would say it's not just the generation or age issue, it's more about cultures and nationality and experience.

But back to your question. Our basic model is, "Bring young people." We just started our summer class for trainees with 170 people, of which I assume about 60% will stay and work in Troika. Most of our partners started at a young age. We have a guy running a key business who is 28, and that is fine with us, absolutely.

Yakubovich: What's interesting about your hiring of Andrei Sharonov is that he's coming from the government and, to the best of my knowledge, he worked for the government all his life.

Vardanian: Fifteen years, yes.

Yakubovich: What does he bring from that government experience? The perception is your bank is different and doesn't want people with a lot of baggage from the old system or bureaucracy. Could you clarify?

Vardanian: The first time we hired a person from government, which was quite unusual, was Oleg Vyugin, who was the deputy minister of finance, the best chief economist. We have been lucky to hire the best professional people -- who are honest and have high ethical standards and are well-known in the market.

Hiring Andrei Sharonov was a big advantage for us because he was one of the most dynamic ministers trying to reform our country. He brings a systematic view about the government and how it is trying to convert the country to a more open market economy. He's also experienced at managing many projects and different groups of clients. We choose people not always by the position they hold, but also by their personal chemistry, so we find people who accept Troika's way of doing things.

I remember I had to fire one of the most professional people we had in our office, because she was not accepting that culture. She told me [that on] the Chicago Bulls basketball team, people hate each other, that Michael Jordan and Dennis Rodman never spoke to each other, and they still win games. To be honest, I would prefer not to win, if it meant souring relationships. So people like Oleg Vyugin and a couple others are unique. We all knew they were Troika people -- very professional with a lot of loyalty. Not so many Russian government officials are like that.

One of my goals has always been to bring different parts of the elite together, to interconnect the government elite and the industry elite in Russia, because right now, it's very badly organized. The same with the educational elite and the cultural elite. I think we've been isolated from one another for the last 15 years. A lot of obstacles and slowing down of good opportunities for Russia comes because of not knowing each other, or not trusting each other. We have these perceptions: Every government official is corrupt, and every business person is a jerk. These perceptions are very difficult to change if you don't know each other. I let people know: You can come and work at Troika, and maybe five or 10 years later, you can go back and work for the government; there will be no problem for you.

Yakubovich: You also have an ambitious vision to build a premier Russian business school. You want Skolkovo, the Moscow School of Management, to become one of the top 20 business schools within 10 years, and you want to establish very high standards for students and faculty. Of course there are many Russian students at business schools here in the U.S. now. How would you convince a Russian student to study at Skolkovo instead of the top business schools in the U.S. or Europe?

Vardanian: The people who want to go to America for their studies are not the people we want to attract, because we're trying to send a message that the world is changing. Before, the model was very simple. All the best people in the world wanted to study in America or Europe because they wanted to study at top schools and get the opportunity to stay and work in those countries.

Now what's happened during last five years, the schools that attract our people realize they are attracting people who want to get rich on the down side, not the people who want to take a risk and build something. Secondly, most of those people now want to come back, and the key measure is they are sending, not just Russian students, but [all kinds of] business students. If you want to learn how to operate in emerging markets, like China, India or Russia, it does not makes sense for you to go to Stanford or Chicago, because you will never learn it there: Less than 10% of the cases in those schools involve emerging markets. If you go overseas to study, you will not be ready when you come back, because the country is changing, transforming.

So if you want to build your career in the emerging markets, come to Moscow, or spend time in China or India. You will learn how to live in an environment where not everything is clear and clean and ethical. You will learn how to operate on a day-to-day basis, not only in your classes but in the projects you work on. It's an option for people who want to take risks ... who are 20 years old, who say, "I want to do something." This is why we are more entrepreneurial.

I am a very strong believer in this school. Business schools will change in the next 20 years dramatically because of the changes in demand and the changes in the infrastructure. People are not scared anymore to go to Singapore or live in India. Before, people wanted to go to America and Europe because it was safer, and the job opportunities were higher, and because of the professors those schools could hire. Now people can easily be hired to teach in Kuwait or Dubai or other places.

And then there is the interactivity of the Internet. Before, information was collected exclusively in a library in Harvard, but not anymore. The question now is not about getting information, but about how to use it, how to make judgments about risk, and how to work with cultural differences. So it's a unique time, because Russia is changing and the industry is changing worldwide. Sometimes I think we are at an advantage building from zero.

Useem: Looking ahead to the next decade or so, what are the key leadership capabilities companies will need to operate within the Russian context? Can one now begin to talk about an emerging Russian model of business leadership?

Vardanian: One thing we are facing is everything in the world is changing faster and with more intensity. The price of some materials goes up or down much more extremely. This is why leaders of the new age need to have a model for making sound decisions and adapting quickly in a world where everything around you changes everyday. Who would have believed the subprime debt crisis would hit America so hard, allowing Chinese companies to buy that debt? Such changes create new opportunities.

I think leaders of today need to be more open minded and ready to learn and have a global vision. Being able to accept cultural differences is crucial to operating in countries like Russia. For example, many people come here not even knowing the Russian holidays. So operating in a country with a different culture, and accepting that, is one of the key challenges for a leader today.

In Russia, I think, the value system is also a key problem. People live in a difficult world, and money becomes the measure of success. But everybody is lost, because the religion is gone, the government is not in control so strongly anymore. So you have to build a company with strong values, with a strong model for decision making and motivation and compensation. This is crucial for success because in some ways the company is replacing other institutions we had before. Working 14 or 16 hours a day, you don't have much time to go to church or to spend time with some political party. So having a company with its own internal conscience becomes a crucial element for a person, not only for their earnings but in their decision of how they will live, and what is right and wrong.

The question for leaders is how we can create a system to attract the best people, because the main fight of the 21st century is not about assets. The main struggle in the 19th century was about the land. In the 20th century, it was about industrial assets and natural resources. In 21st century, the main fight will be for the best people. Because people need to believe they want to work for you, that they can realize themselves in your company. To attract them, we need to have the right system in place and develop them for the long term. Many companies are not ready to do this because they hire people, but they don't spend enough time or effort in developing them. I think leaders need to be very, very committed to these types of things.

Will the Real Social Entrepreneur Please Stand Up?



How can you distinguish a business entrepreneur from a social entrepreneur? The answer is not as straightforward as it once was, says Abraham George, founder of The George Foundation, an NGO focused on poverty alleviation in southern India. Both are focused on profitability, margins and returns on investment. But social entrepreneurs go a step further, not only aiming to use their business activities to benefit society, but also involving society's poorest members -- now often referred to as the "Bottom of the Pyramid" -- in efforts to reduce poverty and raise standards of living.

That's all well and good, explains George in this opinion piece, but it is increasingly unclear who "the poorest of the poor" are. Definitions vary widely, which often means marketing strategies, growth plans and even products and services are not catering to the world's poorest people. In the worst cases, even well-intentioned social entrepreneurs are misleading investors and the general public -- and more importantly, letting down the billions of people living in poverty.

The concept of social entrepreneurship as a characterization of social responsibility for business organizations has gained considerable popularity. There is growing belief in development and donor communities that this form of for-profit activity might be the long-sought way to alleviate poverty at the so-called Bottom of the Pyramid (BoP) -- the poorest segment of society. Yet, there is no consensus within these communities about what social entrepreneurship is and how the BoP is defined, making it easier for conventional for-profit activities to claim a higher social-service status than many ought to. What constitutes social entrepreneurship serving the BOP segment, and how can BoP be defined so that the poor are better represented?

At the heart of a social entrepreneur's activities are business principles that organize, create and manage a venture to bring about social change. Social entrepreneurs usually have novel solutions to society's pressing problems. Some work through non-profit or citizen groups, and most are now in the private sector.

While both business and social entrepreneurs measure performance in terms of profitability and return on investment, a social entrepreneur also includes the impact she or he makes on society -- the so-called "double bottom line." The main aim of a social enterprise is to further social and environmental goals for a good cause in a financially sustainable manner. In its purest form, social entrepreneurs are non-profits that reinvest the money they make to achieve a social goal. Most social enterprises are built on business models that combine a revenue-generating objective with social-value generation. Put another way, they redefine entrepreneurship as we have long known it by adding a social component.

Business entrepreneurs are constantly seeking ways to increase profits through more sales, higher margins, new markets and product expansion. Social entrepreneurs may also seek higher profits, yet be willing to accept lower margins and operate in more difficult market

environments as long as they are able to offer social benefits. The very nature of their field activities may reflect a pursuit of what they call a "mission-related impact," as opposed to normal businesses that are more concerned about such issues as competition and product differentiation.

Unlike activities that focus solely on contributing to social-service causes, social entrepreneurs must find a way to balance the mission-related impact and the desire to maintain or enhance profits. Social entrepreneurs often emphasize cost reduction to achieve sufficient margins, and use innovative techniques to serve their market. The degrees to which social entrepreneurs pursue social impact as opposed to profitability vary considerably, but in all cases financial sustainability is fundamental. However, external investors in social enterprises usually do not have high return expectations and are often willing to forgo returns if they can see significant social benefits from an enterprise's activities.

The Quest for Economic Equality

Today, many ventures claim to be social enterprises, some with the professed goal of poverty alleviation. However, in the frenzy of associating with social good, many of their assertions are not scrutinized sufficiently. In the absence of precise conditions to validate their claims, it is difficult to identify the entrepreneurs whose main goal is wholly focused on reducing poverty.

A social entrepreneur aims to add value via incremental benefit, which accrues to a segment of society. Social entrepreneurs who aim for economic equality target an underserved or highly disadvantaged population that lacks the financial means to achieve transformative benefits on its own. One well-known social entrepreneur is Muhammad Yunus, who founded Grameen Bank to provide microfinance in Bangladesh, for which he received a Nobel Peace Prize in 2006. His pioneering work was based on offering credit to people unable to obtain loans from banks and other conventional sources so they could set up and run their own small business ventures. Grameen and several other organizations that have improved the lives of disadvantaged people certainly fit the definition of a social enterprise.

Subsequently, a new microcredit industry mushroomed in developing countries, with most providers claiming that they can lend money profitably to the poor. They present themselves as organizations serving the BoP, and by default, the poor. However, there is reason to be sceptical about their motives, business practices, performance and the benefits they offer. Usually, the general public believes that microcredit and other for-profit companies primarily operating in the rural parts of developing countries have made poverty reduction one of their primary goals.

I would like to offer some clarity here. Social entrepreneurship can come in many forms, creating products and services that improve consumer safety, offer environmentally friendly goods or services, and contribute to poverty alleviation and other worthwhile initiatives. Many of these ventures are valuable to the economy and society in general. The problem arises when some of the initiatives say their main goal is to alleviate poverty, often in the hope attracting public support and investment from the philanthropic community, despite the fact that they do not meet the minimum criteria to be a poverty-alleviating enterprise.

According to much BoP literature, a BoP venture is a revenue-generating enterprise that sells goods to, or sources products from, people at the "base of the pyramid" in order to improve their standard of living. Some observers have refined the definition as revenue-generating enterprises that directly create "social value" for BoP communities through a product or service. Recent studies go so far as to exclude companies that sell non-

essential items to BoP communities. All this aside, a for-profit venture that claims to be a social enterprise alleviating poverty must meet at least one of the following criteria:

- ✓ Employ and/or train proportionately significant numbers of poor people in its main business activity (for example, making mosquito nets or processing vegetables) rather than using them as sweepers, porters or other cheap manual labor.
- ✓ Produce or offer essential products or services (health care, education, housing, food, clean water and the like) at affordable prices to people who earn US\$2 or less a day.
- ✓ Make credit available to poor people at reasonable rates (no higher than twice the rate charged by banks to their creditworthy clients) for personal or business uses without unfair or unethical lending practices.
- ✓ Offer technical, material or financial assistance to enable the poor to engage in family-run businesses, with returns to investors generated from products made from the activities (producing dairy products from cows and buffalos, making designer quilts and cushions sold at attractive prices to affluent consumers and so on).

In each of these criteria, a social enterprise employs the poor in its business activity (beyond menial labor) at fair wages, makes it possible for them to start their own entrepreneurial ventures, and/or offers essential, yet affordable, products or services. The poor must benefit directly from the activities and be from the BoP.

Saying the poor will benefit from the trickle-down impact of a regular business that is run by or for people with higher incomes does not qualify that business as a social enterprise; otherwise, every corporate entity, including Wal-Mart, would fit the definition of a social entrepreneur. What's more, the product or service purchased by the beneficiary must be affordable. Without such qualifiers, classifying social enterprises would mean accepting exploitation of and extortion from the poor in the name of social good, as in the case of local money lenders who charge exorbitant interest rates to people who badly need loans to meet emergencies.

Who Is and Isn't BoP?

The way to know whether a social entrepreneur is reducing poverty is to determine if she or he is involved directly in serving the poor. Investors must differentiate between for-profit ventures set up in poor areas or employing low-wage labor, and others that are clearly designed to improve the lives of poor people at the BoP. Without making such distinctions, every business operating in deprived communities or selling products and services to the poor and the not-so-poor will be able to call themselves social enterprises engaged in poverty alleviation.

C. K. Prahalad, in his book titled, *The Fortune at the Bottom of the Pyramid: Eradicating Poverty through Profits*, describes an untapped market consisting of poor people who have not yet been targeted by major companies. According to Prahalad, this market of an estimated five billion people globally earn less than US\$2 a day and can be reached by creative entrepreneurs offering affordable products and services. In doing so, he says, both the entrepreneur and the poor benefit immensely, creating wealth and reducing poverty.

The idea of a huge win-win opportunity has encouraged many academics and researchers to explore this underserved market. The development community focuses primarily on the needs of people forming the base of the pyramid, while others argue that a much larger segment of the low-income population deserve corporate attention. Accordingly, Prahalad's estimate of the BoP market size was expanded to include people living on more than US\$2 a day. This resulted in the inclusion of different segments, from the absolute poor to those having significant discretionary income.

According to a report published by the World Economic Forum in January 2009 titled, "The Next Billions: Unleashing Business Potential in Untapped Markets," the BoP market consists of some 3.7 billion people globally who earn less than US\$8 per day per person, with an aggregate annual income of US\$2.3 trillion. Of them, 2.7 billion people have little to significant discretionary income to make the market attractive for businesses. Meanwhile, an article in The Economist described a market of 2.6 billion people earning between US\$2 and US\$13 a day at 2005 purchasing power parity. Whatever the overall size, if these people can be engaged as producers, consumers and entrepreneurs, new wealth can be created and poverty significantly reduced, conclude both publications.

Unfortunately, in most definitions, people earning less than US\$2 a day are grouped under the BoP umbrella along with others earning as much as US\$13 a day. Granted, people composing the BoP are far from homogenous, and the multifaceted nature of poverty makes a consensus definition of the BoP elusive. However, the consumption pattern in the lower half of this wide range is different from the upper half. Numerous studies show that people in the former group spend all, or nearly all, their income on essentials. To view this population as potential consumers is grossly inaccurate; they try to survive each day on what little income they earn.

The trouble with Prahalad's claim of a fortune waiting to be made is his assumption about the purchasing power of the BoP population living on less than US\$2 per day per person. Affordable consumer goods can raise the standard of living of the poor, but first their incomes must rise to have any sort of purchasing power. Experts like Aneel Karnani, a professor at the University of Michigan, advocate greater engagement of BoP communities as suppliers, and maintain that the only way to alleviate poverty is to raise the real income of the poor. Without sufficient skills and capital, the poor often end up being sources of labor and rarely suppliers of products, and many earn far less than US\$2 a day. To conclude that they are a worthwhile market as consumers or suppliers for entrepreneurs is unrealistic. To group them with others is not only misleading, but also provides an opportunity for businesses to inaccurately portray themselves as serving the poor.

The Bare Necessities

The George Foundation's experience in the field in Tamil Nadu, India, has shown that people living on less than US\$2 per day are unable to venture into businesses they are unfamiliar with or don't have the technical skills to conduct. Apart from farming on small parcels of land or maintaining some sheep, a cow or two, or a few hens, the poor can only engage in non-skilled activities, such as selling produce from roadside stalls. They do not have the capacity to start, say, a tailor or bicycle repair shop. Anyone engaged in such skilled activities is not in the US\$2-per-day BoP described by Prahalad.

Surveys covering around 16,000 people in 17 villages in the Krishnagiri district of Tamil Nadu by our foundation consistently show that this segment of the population cannot even afford their medical or educational needs. Their priorities are usually a place to live, food, medicine and a place for worship, mostly in that order. Yet these poor people live in single-room huts with leaking roofs, eat non-nutritious food in inadequate quantities, seek medical attention only when their health deteriorates badly, and worship modestly decorated idols under banyan trees set aside for "lower castes." It is unrealistic to assume that they would purchase purified water or toothpaste instead of rice and lentils to feed their families, though these items are essentials for consumers in developed countries.

According to a recent World Bank estimate, 42% of India's population lives below the new international poverty line of US\$1.25 a day; this works out to over 500 million people as of the end of 2009. Over 900 million people, or 75.6% of the population, in India are now

earning less than US\$2 a day. In sub-Saharan Africa -- the poorest region in the world -- nearly 600 million people, or 72.2% of the population, are below US\$2 a day. As mentioned, these poor people are not presently consumers of discretionary products, and they are not likely to be any time soon unless their incomes rise dramatically. As the experience of NGOs BRAC in Bangladesh and Aravind Eye Care in India shows, those who are considered poor by the World Bank's definition of below US\$2 a day can have access to services and products other than those that are absolutely essential only if they are provided free of cost.

Further complicating the subject is the concept of family income. A single person with no dependents might be prepared to spend money on discretionary items if she or he earns, for example, US\$8 a day. However, this person is unlikely and unable to spend this income if she has to support four family members. The average family size is more than five members in most developing countries, with no more than two members earning an income. Poor people prefer to live in family units, supporting each other and caring for their parents. Even if a family income is US\$10 a day, the average income per person in a family of five is only US\$2 per person -- the upper limit for those traditionally included in the BoP. These families have very little left to spend on non-essentials, regardless of how beneficial the items would be to them.

However, if the poor can be engaged as producers and entrepreneurs, they might one day have the purchasing power to be consumers of discretionary products and services. Income generated from gainful employment or entrepreneurial activities can elevate their economic status to be consumers of non-essential items. They can be engaged as suppliers in labor-intensive activities, such as grinding spices, packing agricultural produce or weaving baskets, provided they are given all the requisite ingredients and tools. That's why grants are needed to cover their start-up costs, even for small ventures. As some experts note, for all the promise of market-based business models, most ventures are viable in markets in which the poor have at least some income or assets.

There is a clear distinction between employing the poor as trained labor in the production process, whether in a factory or at home, and enlisting them as independent suppliers -- but often neither is feasible. But the poor can be engaged in the distribution and sale of goods in markets, provided the entrepreneur assures a sufficient number of buyers. The poor are able to earn more this way than working in manual labor for someone else, and all risks are borne by the entrepreneur.

Many poor families prefer to be involved in family-run micro businesses, such as raising cattle or poultry, but are unable to do so because they lack resources. They need seed money, not least because there is often a gap of several months between when they start running the business and when revenue begins to come in. During this time, they might be forced to borrow money at very high interest rates from local moneylenders to meet their daily living expenses. What's more, despite the hard work and risks they take in such endeavours, there is no assurance of a revenue stream.

Only through hands-on, third-party guidance and direct assistance in the form of donations can the poor hope to be engaged in sustainable activities. Businesses started with loans carry the heaviest burdens and are often forced to fold because of a lack of capital if a loan needs to be repaid and, as is often the case, the family incurs even more financial obligations. What the poor want today to improve their lives is not microloans they cannot afford to repay, or the innovative products they cannot buy even at very low prices; they need steady jobs and income-generating assets, such as animals and cultivable land, without incurring debts as a result.

Top, Middle, Bottom

Now, with the wider definition of BoP at US\$8 per day per person, there is greater room for many so-called social entrepreneurs to claim that they are reducing poverty. Even credible organizations like Acumen Fund will probably accept the fact that their loans and investments are directed at entrepreneurs well above US\$2 per day in income, and their customers are also usually in the same category. That is not to say that organizations like Acumen are not helping businesses engaged in socially beneficial activities.

The confusion over the meaning of BoP could be resolved by defining three segments of the pyramid. The top segment includes people who have sufficient discretionary income to purchase goods and services beyond essentials. The middle segment -- people earning between US\$2 and US\$5, or even US\$8, a day -- have some capacity to buy discretionary items. The third segment comprises people truly in the BoP, who are on less than US\$2 a day and do not have the capacity to spend money on anything beyond bare essentials.

Most people falling into the Middle of the Pyramid, or MoP, are lower middle-class individuals who occasionally have discretionary income or savings to purchase essentials such as toothpaste, an electric fan or even a small refrigerator. They are unlikely to buy big-ticket items or what they consider luxuries, and are highly price sensitive. Over time, they are likely to improve their economic status by seeking higher skilled jobs and working in small businesses. As their income increases, they are able to afford more discretionary products and services, and might be an untapped market for small entrepreneurs and even larger companies.

To cater to them, businesses need to be creative about developing and delivering their low-cost products and services without creating a perception of inferior quality. A significant proportion of people in the MoP have both basic education and work skills, so they are more likely to produce and supply some types of goods and services. This is also a market where both impact and scale can be achieved. Social entrepreneurs, such as microfinance companies, will be doing a worthwhile service catering to the MoP market.

As poverty programs take hold, many poor people in the BoP might move to the MoP. With an increasing number of people falling into the MoP bracket, it might well be the fortune Prahalad has been asking his followers to go after. But simply raising the upper limit for the BoP's definition does nothing more than create the erroneous impression that a very large, untapped market segment with significant purchasing power is ready to generate substantial profit for companies and reduce poverty.

For anyone engaged in poverty alleviation, a more sensible definition of the BoP would be below the original level of US\$2 a day. The World Bank refers to people below the US\$2 level as poor, while those below US\$1.25 as extremely poor. Even under the US\$2 mark, around 50% of the population of the developing world, or nearly three billion people, are poor. This is by all measures a large enough segment to deserve special attention.

The strategies needed to make an impact on the BoP are very different from the consumer, producer or supplier models suited for the MoP market. It is unlikely that many people in the BoP have the entrepreneurial skills, capabilities and resources to succeed in businesses that offer more than subsistence income. In addition, the relatively greater dearth of outside capital restricts the number opportunities and shapes the trajectory of a new venture's growth.

Governments, international agencies, NGOs, donors and private companies are needed if poverty is to be significantly reduced within a reasonable period of time. The assumption that MoP ventures will somehow reduce poverty within BoP is unsubstantiated.

The private sector, including businesses not considered social enterprises, can play a major role in poverty reduction by locating factories and other facilities in or close to rural and deprived urban areas. Governments can motivate businesses to do so by providing infrastructure and fiscal and monetary incentives. Direct help such as job training, employment at higher wages and benefits, better and affordable health care, and quality education will help the poor move into the MoP in a few years. Meanwhile, subsidies and concessions have to be offered to give them access to important services. The focus of poverty reduction should not be in selling to this market or trying to turn them into entrepreneurs; only through vibrant economic activity that generates employment can there be sustainable change.

Social entrepreneurship is a noble business activity that can serve all segments of society. But it is not necessary to appear to be helping the poor to gain an elevated social or moral status in business. Some entrepreneurs might prefer to invest in social enterprises rather than in regular for-profit businesses, but investment must be sought under the right premise. Not to do so is highly unethical, especially because it relates to the poor.

Innovation 'Out of Necessity': Entrepreneurship during a Downturn



During a recession with fast growing unemployment, looking for ways to incentivize entrepreneurial activity and enhance corporate liquidity has become a strategic focal point for Spanish companies. Ignacio de la Vega, director of the IE Business School's Center for Entrepreneurial Management and president of the Global Entrepreneurship Monitor (GEM), which analyzes entrepreneurial conditions in 43 countries, spoke with Universia-Knowledge@Wharton about the current economic crisis and its impact on entrepreneurship. The GEM 2008 Global Report, which was recently released, is sponsored by the Ministry of Industry's small and midsize business division and the Banesto Foundation for Society and Technology.

Universia-Knowledge@Wharton: *What has been the impact of the global economic crisis on entrepreneurial activity in Spain? What differences are there compared with previous crises? In what ways will entrepreneurial activity evolve in 2009?*

Ignacio de la Vega: Starting from 2000, we have measured the macro-climate and environment in Spain very carefully at our organization. We began with an entrepreneurial activity rate of 4.55% that year, and we see an extremely important turning point between 2000 and 2001, when the rate climbed to 7.78%. If we think about what was happening at that time in the market, we see that it was a period of boom, when the Internet bubble in Spain was at its decisive moment. There were lots of opportunities to start companies and, unlike the current situation, when entrepreneurial activity did not bear fruit it was not because of a shortage of work opportunities but purely because of the particular opportunity. In 2002, we practically returned to the levels of 2000, with a 24% drop in the rate of entrepreneurial activity, which is an accurate reflection of the overall economic climate. Then the Internet bubble burst, and there was a serious crisis in the technology sector -- a sector crisis, not a systemic crisis like today -- and there were the attacks of September 11 ... and finally, optimism declined along with the rate of entrepreneurial activity.

Ever since then, we've been experiencing rising economic activity, until this year with some isolated declines, but that reflects the growth of our economy since 2000. Analysts began to notice the crisis in July 2007, but at that time it was a crisis in financial markets that had yet to spread into the real economy. In July 2008, at the time of our annual study, the financial crisis already had a very important impact on the real economy and we were expecting successive declines in the rate of economic activity in coming years. Given today's challenging conditions, including the climate of pessimism, scarcity of financing and so forth, the rate [of entrepreneurial activity] will continue to drop. Nevertheless, we have been living through a new era ever since 2000, and an amazing drop-off in job opportunities -- the unemployment rate is over 15%. Obviously, entrepreneurial projects are a very important source of development that takes place 'out of necessity.' For the same reason, the decline will not be as steep as in the 2000-2002 period because, since there are fewer job opportunities today, many unemployed people will have to look for refuge in self-employment.

UK@W: What barriers are today's entrepreneurs facing?

I.D.V.: There are three fundamental barriers at the moment. The first is psychological. Given the problems in the market, starting a business appears to be very risky, especially in a country like ours, which has a culture where there is a clear fear of failure and risk. We find ourselves in a tense position, halfway between the need to find means for income and professional activity, and the psychological fear of failure and risk. In my view, the need [for income] will win out.

Once that barrier has been overcome, the second big barrier is [a shortage of] financial resources. Fewer financial resources are coming from the two principal sources for financing entrepreneurial activity: First, debt, which you get from financial institutions, and public support is not functioning at this time. Second, it's not coming from informal investors, either; especially when it comes to the smaller companies we're talking about, where [entrepreneurial] activity has fallen by 13%. The figure of the 'business angel' was already weak in Spain [before the crisis], and in the current situation, those people who are liquid expect to make money [on their investments], and those who have already invested [their funds] don't have any more cash to invest. Our 2008 report already reflects this situation; it shows there has been a significant increase in the number of entrepreneurs who develop a business project and contribute 100% of the financing. Nowadays, given the rate of unemployment, a normative change is going to permit people to capitalize up to 60% of their unemployment subsidies and dedicate it to entrepreneurial activity. This will add some fuel to the system.

The third barrier is real demand. Demand has shrunk a great deal, and it is very hard to find [business] opportunities in many sectors. Competition between companies is already well established and, in an attempt to survive and grow, many companies are becoming more aggressive. That occasionally means lowering their prices, and taking competitive positions in the marketplace that make it hard for someone who does not have these competitive advantages to enter the market.

UK@W: How are people dealing with those obstacles? What concrete measures are they implementing, and what's your assessment of them?

I.D.V.: The solutions involve laying out public policies that are more efficient than those we have today; that includes making it a clear responsibility of financial institutions to get more involved in the system, and really bring to the market some of the rescue measures for small companies that have already begun as commitments by the communications media to develop some optimism within the system. As long as we do not see the light [at the end of the tunnel], we won't be spending. When demand contracts in the ugly way it is contracting today, entrepreneurial activity becomes paralyzed. Companies leave the market, and it is very hard for others to enter it.

The Spanish government has limited resources. For example, its monetary policy is determined by the EU. However, there are some things it can do. It has tried to inject confidence in the market with its bank rescue plan, but it has had some mediocre results because many banks are not participating or are doing so only by dribs and drabs; that way, banks are not required to provide liquidity to the market. The problem is if the small companies don't get any liquidity, and they turn off the flow of credit, and then even if they sell less and many of them don't get paid when they do sell, they wind up not being able to take care of their [debt] obligations -- not making nominal payments, payments to suppliers, and so forth. The vicious circle tightens, and it is very harmful. To remedy this situation, you create a rescue plan for small companies that basically consists of providing them with some 10 billion euros, but there is the problem of communication here. Financial aid is available through the ICO (the Ministry of Economics' Official Credit Institute), but the catch is that this operates through financial institutions that have a maximum level of

requirements when it comes to [providing] guarantees. As a result, small companies continue to lack access to that financing.

There is a need for more aggressive solutions such as if the government were to strongly guarantee help through the ICO for small companies that have a certain degree of insolvency. There are 3.5 million small companies, of which 80% have financing problems. On the other hand, you could jointly create a public bank to develop projects aimed at smaller companies, although that is also difficult to communicate given today's community norms. The solution definitely involves injecting liquidity and confidence into the system. Some banks do that, but with complex criteria and in sectors of activity that are not subject to so much risk. In addition, the criteria for solvency are especially high, leaving out strong companies that could survive and that, at best, have a cash flow problem.

Starting from there, there are lots of other measures: A fiscal agreement for the serious reduction of taxes so that small companies can delay some tax payments -- so that they can spread out payments of VAT (Value Added Taxes); and for social security liquidations, something that they can do now but which will have an extremely high cost when there is a bank guarantee.

UK@W: Experts talk a lot about innovation and exports as two good tools for getting around the crisis. Do you believe that the right policies for addressing those subjects are getting off the ground today?

I.D.V: Innovation is not just about developing innovative R&D in technology. That is just one sort of innovation that is possible for a very specific sort of company. Many small companies don't fit in that category. The sort of innovation within reach of small companies often involves some technology but, especially, it involves an innovative business model. For example, a neighbourhood supermarket faces a very trying situation such as declining revenues, higher costs for all sorts of things including logistics, and so forth. For this sort of entrepreneur, innovation could mean trying to generate additional value for customers with classic solutions such as discounting, or it could mean looking for more innovative products, since competing simply on the basis of price has become so difficult.

You have to invest in R&D and have a public policy [to support that], but people need to know this is about long-term investment. It doesn't make sense to say that [R&D] is a [short-term] solution to the crisis. If we begin to invest seriously now and, for example, create a Ministry of Innovation, perhaps we can diversify the business model of the country in ten years. The reality is that the government's R&D funding has been squandered; on occasion, it was used for buying new machinery and other initiatives that are not really R&D.

As for exports, diversified companies are more sustainable, according to the textbooks. But we are talking about small companies exporting and, at times, that is an oxymoron, a contradiction in terms. Ultimately, it is a problem of competitiveness. In order to export, you need to be competitive, and in this country we have a very troubling situation in that regard. At times, the origins of that problem are in public policy; we have trouble exporting because we have exhausted our options for exporting in many sectors. In addition, we start with an unfavourable scenario in many low-cost markets in that salaries in those countries are up to eight or 10 times lower than in Spain; absenteeism is practically zero there; quality control requirements are very lax, with no controls, etc. Things that we do not require of companies of [non-European] origin [such as China] are requirements for our companies [in the EU], and this makes our competitiveness deficit even a bit deeper. You have to start from the root of the problem: We need to educate our companies,

provide them with resources so that they can be more competitive. And we all need to play with the same rules.

UK@W: *The database for your report includes 50 countries. What is the profile of the typical Spanish entrepreneur? Has it changed a great deal in recent times? If so, why? How does it differ from that of neighbouring countries?*

I.D.V.: Our rate of entrepreneurial activity is a bit lower than in English-speaking countries, but higher than in the countries surrounding us. The profile of the entrepreneur is becoming more uniform, but the interesting thing is the change that has occurred in the last two or three years; the typical entrepreneur is maturing and aging. The average age has gone up by almost four years, and it is approaching forty [years of age]. These days, an entrepreneur coming into the market needs more professional baggage -- more knowledge of the sector and so forth. This is very common among entrepreneurs older than fifty. This is related to the concept of becoming an entrepreneur 'out of necessity' -- starting at that age because your professional career in Spain has come to an end even though that shouldn't be the case. In addition, today's entrepreneur has a higher level of training, and education now provides an additional competitive advantage. Today's entrepreneur also invests more [in his or her business], and the average cost of an initial investment in a project has gone up. The entrepreneur contributes part of the funding from his own pocket, which means that there are fewer and fewer [external] sources of funding.

In times of crisis, the ratio between male and female entrepreneurs evens out. This is something positive, and it obscures a reality of our environment. In families where there are not workers, the woman often develops her entrepreneurial project on her own. This can even happen, at times, in traditionally masculine business sectors. Declining activity in sectors such as real estate, construction and automobiles means that male entrepreneurs are disappearing and female entrepreneurs are being created in the service sector. Traditionally, Spaniards invest in the service sector because it is more welcoming, and it has minimal risk. However, we also observe that over the past twelve months, there has been a significant increase in the industrial sector of renewable energy.

UK@W: *Do you believe that the crisis will change business habits in Spain?*

I.D.V.: For some years, you've already been seeing a certain change, but this is a little like R&D in that it is a long-term process. Nowadays, few Spanish college students want to become entrepreneurs. We need a profound change that begins with training, a change in values and society. So long as the communications media do not recognize the entrepreneur, rather than the speculator, as the person who generates value, things will go poorly for us. This change was beginning to occur before the crisis, building on the boom. Now we are moving in the right direction. In addition, the government is very interested because small and midsize companies generate more than 80% of all new jobs. The responsibility belongs to all of us -- the people, the government, the business schools, the universities and so forth. What kind of country do we want to be in the future?

Huawei Technologies: A Chinese Trail Blazer in Africa

Walk into a bookstore in Beijing and you will find shelves filled with books about Huawei Technologies. As one of China's fledgling multinational companies and a major force in the international telecommunications equipment industry, Huawei is rewriting the rules of competition in a global industry. Moreover, it is the first non-state-owned Chinese company to successfully expand its operations internationally, some observers say, and it has become a model for other Chinese companies and a source of national pride.

Despite the challenges facing the global economy and the telecommunications industry, Huawei achieved contract sales of \$16 billion, representing a 45% year-over-year increase, with approximately 72% of its revenues coming from international markets. In less than a decade, Huawei has penetrated almost every market around the world, investing heavily in its business and technology product lines, which includes fixed networks, mobile networks, data communications, optical networks, software and services, and terminals.

According to an industry insider, Huawei segments the telecom equipment industry into three major categories: Internet switches, fixed line networks and wireless networks. "Huawei is currently the number three global company in wireless networks and number two in fixed line and switches," says founder and CEO Ren Zhenfei. "But Huawei's goal is to become number one in all three segments." Its competitors include both well-known European and American companies, such as Alcatel-Lucent, Cisco Systems, Nokia Siemens Networks and Ericsson Telephone Co., as well as lower-cost Chinese competitors such as ZTE Corp.

Huawei currently serves 270 operators in about 100 countries, including 35 of the world's top 50 telecommunications companies. As of March 2007, Huawei had more than 83,000 employees worldwide, of whom 43% are engaged in R&D. The company reports that it dedicates at least 10% of its revenues to R&D and is now the fourth largest patent applicant worldwide, with more than 20,000 applications filed by 2007. Last year, Huawei won 45% of all new Universal Mobile Telecommunications System and High Speed Packet Access contracts, making it the top supplier in this area. Huawei is also now one of the top three suppliers in the global GSM market; by the end of 2007, it had shipped base stations with total capacity of 700,000 carrier frequencies, serving more than 300 million GSM users worldwide. (GSM is currently the most popular second-generation standard for mobile phones.)

It is hard to understand Huawei's success without considering its humble origins and distinctive corporate culture. In 1988, Ren, a former People's Liberation Army (PLA) officer, founded the company as a third-party reseller of telecom devices in Shenzhen, China. Five years later, Huawei achieved its first breakthrough when it launched its C&C08 digital telephone switch, which had the largest switching capacity in China at the time. By initially deploying in small cities and rural areas, the company gradually gained market share and made its way into the mainstream market. From 1996 to 1998, Huawei experienced exponential growth, coinciding with the boom in China's telecommunications industry. After winning its first overseas contract in 1996 with Hong Kong's Hutchison-Whampoa, Huawei expanded to Russia and Africa. In Africa, Huawei began operations in 1998, starting in Kenya, and has now become the largest CDMA product provider in the region. During the same year, Huawei hired IBM consultants to

gain expertise in management strategies in a concerted effort to learn industry best practices.

First, the Countryside

As a follower of Mao's thought, Ren has drawn much inspiration from the PLA's military strategy -- reflected in Huawei's business strategy, organization and corporate culture. For example, Huawei has relied on a well-known Maoist strategy of first focusing on seizing the countryside, then encircling and conquering cities. Huawei followed this strategy, achieving its first breakthrough in 1993 when it aggressively marketed its digital telephone switches in smaller towns before expanding all over China. Later, Huawei utilized this same strategy by first targeting the underserved markets of Russia and Africa before moving into Europe.

Military culture is also epitomized in Huawei's rigidly hierarchical organization, where emphasis is placed on hierarchical management rather than on individual employees, who are viewed as easily replaceable foot soldiers. Like that of many other East Asian firms, Huawei's corporate culture relies heavily on rhetoric and propaganda. The introductory article of Huawei's basic law reads: "Love for our homeland, fellow citizens, work and life is the source of our cohesion; responsibility, creativity, respect and solidarity represent our company's quintessential culture."

Other aspects of Huawei's culture are characteristically Chinese. Resilience and hard work, qualities valued in traditional Chinese culture, are emphasized at Huawei as a way to gain competitive advantage. Another classic East Asian trait, putting the group before the individual, can also be seen. Huawei expects its employees to place their personal lives second in order to serve their company loyally. Its approach to business, referred to as "the way of the wolf," is characterized by reliance on instinct, extreme resilience and employees' willingness to cooperate and sacrifice themselves for the sake of the pack.

Huawei's strong identity, however, has not prevented the company from adopting Western tactics. In the mid 1990s, most Huawei managers were sanguine about the prospects of the firm. However, Ren was aware that Huawei had severe growth limitations, mainly due to the lack of organizational expertise and the absence of a viable long-term strategy. He set out to change the company into a solutions provider. By 2000, when the communications industry slowdown was noticeable, Huawei was already in the midst of a restructuring process that gave the firm its competitive edge against local rivals.

According to an industry insider, "Ren recognized that the best way to overcome Huawei's limitations was to learn from leading Western companies." Thus, from 1998 to 2003, the company hired IBM for management consulting services, modeling itself after the American company. Under IBM's guidance, Huawei significantly transformed its management and product development structure. Ren prioritized R&D and supply chain management by adopting IBM's Integrated Product Development (IPD) and Integrated Supply Chain (ISC). After discovering Huawei's return on investment in R&D was one-sixth that of IBM, Ren stipulated mastery of IBM's IPD methodology. Furthermore, Huawei adopted ISC since supply-chain performance was far below potential. According to *The World of Huawei*, Huawei's on-time delivery rate in 1999 was only 50%, compared with 94% for competitors; annual inventory turnover was 3.6%, compared with 9.4% for competitors. Adopting ISC entailed winning over suppliers and partners, many of whom had little appetite for Western management practices.

While working with Huawei, IBM was completing its own strategic change from a hardware vendor to an IT solutions provider. Ren drew from IBM's experience, also realizing that the future of Huawei was not in manufacturing what others invented, but in creating excellence in both research and service. This strategy, which may be conventional for

leading Western firms, is unusual in China. Although Huawei management possessed vision before hiring IBM, it was through the experience, insight and methodologies gained from working with IBM that Huawei managed to adopt new management practices and become a global player.

Nowhere is Huawei's presence and strategy more evident than in Africa, a continent it entered for the first time in 1998, where it successfully dispelled the "made in China" image of low cost and low quality. Beginning in the 1990s, Huawei shifted its role from a manufacturer to that of a complete solutions provider. Today, Huawei creates some of the most sophisticated telecommunications equipment in the world and, according to the company, is "not making it cheaper -- it's making it better." Armed with its combination of a corporate culture marked by Communist roots and leading Western business practices, Huawei has executed a strategy composed of superior pricing, customer service and brand awareness to penetrate and dominate the African market, one in which few multinationals have been successful. Huawei has established a reputation as the preferred low-cost, yet high-quality mobile network builder. Its sales in Africa had topped \$2 billion across 40 countries by 2006.

According to the former head of Huawei's operations in West Africa, Wilson Yang, Huawei's profit margins in Africa can be up to 10 times greater than those it realizes in China. Huawei manages to achieve tremendous margins while still pricing itself only 5%-15% lower than its major international competitors, Ericsson and Nokia. Furthermore, Huawei is cautious not to price itself too low so that it will not be seen as yet another low-cost Chinese provider. In contrast, Huawei's main Chinese competitor in Africa, ZTE, consistently prices 30%-40% below European competitors and, consequently, its products are perceived as being of inferior quality.

Huawei's pricing methodology can also be traced back to its experience with IBM, a company that helped Huawei learn the importance of turning R&D into cash and of approaching product development from both technical and business angles to ensure investment returns. This represented the transition for Huawei from a low-cost volume competitor to a value-added leading enterprise.

Learning from the Master

Another factor behind its African success is its attention to superior customer service. In 2000-2001, Huawei faced a confluence of challenges: IT investment dried up, profit margins shrank and the market faced oversupply, leading profit growth to evaporate. IBM consultants stressed increasing profits through better supply-chain management, stronger R&D and more integrated corporate structure. However, Huawei was also learning a key strength of IBM: unparalleled service. Ren appreciated the value of this concept under looming adversity. Unmatched attention and commitment to service eventually came to dominate the firm's global strategy.

Indeed, superior service was a distinguishing feature of Huawei's business model in Africa and its core competitive advantage. Yang explains how this aspect of Huawei's business model ultimately led to global growth: "Three years into its Africa experiment, Huawei still had only 20 employees on the ground and very few contracts. However, our existing clients noticed the unparalleled responsiveness of management and personnel. We brought a Chinese attitude to both work ethic and relationship building in Africa. The result was that clients soon realized they could rely on Huawei 24 hours a day, seven days a week. We emphasized close relationships to foster that reliability and soon began to realize collateral benefits. All of a sudden, our reputation for superior service and higher quality gained us introductions to decision makers in new markets, faster network building



and advanced notification of competitive bids. This enhanced Huawei's ability to price safely below the competition."

Huawei is also using its business in Africa as a training ground for establishing itself as a global brand through three distinct channels: policy, local investment and marketing. Huawei leverages its resources and products to connect with developmental policy throughout Africa. . In May 2007, at a forum held in conjunction with the 2007 annual meeting of the African Development Bank Group (ADBG), Huawei set out a vision for Africa that is centered on "bridging the digital divide and enriching the lives of Africans." Huawei prides itself on giving back to the African community; one of the ways it does this is through donating educational communications equipment to schools.

Huawei has begun to establish regional training centers in African countries such as Nigeria, Kenya, Egypt, Tunisia, Angola and Guinea. By August 2004, Huawei had invested more than \$10 million dollars into its Nigerian training center. Recently, Huawei opened a new training facility in South Africa, its fifth training center on the continent. There is a sixth center currently being built in Angola. The company now provides training for up to 2,000 people annually. Such local investments by Huawei help bolster the local economy with job creation and localized management while improving the company's image in the eyes of local consumers, businesses and potential partners.

Huawei is asserting its brand potential in Africa by means of smart marketing strategies and "going green," including optional use of solar and wind energy. It actively promotes its GSM base stations as among the most eco-friendly in the business, claiming that it cuts energy usage by 47% compared to regular towers. By the end of 2007, Huawei reported that it had deployed more than 100,000 green base stations, which saved 570 million kilowatt-hours, or 170,000 tons of coal.

Huawei Technologies has built a world-class enterprise, reaped tremendous profits in Africa over the last 10 years and is contributing to growth in Africa. In China, domestic media have heralded Huawei's success as a model for other Chinese companies trying to transform themselves from domestic entities into global players. Huawei has already profitably penetrated the European market, winning major contracts and servicing prominent clients such as Vodafone and Telefónica. As Huawei leads the way for home-grown Chinese corporations, the challenges its leaders face going forward include maintaining its growth and transferring the lessons learned in Africa to Europe and North and South America, all of which represent both enormous profit potential and new strategic challenges.

Shai Agassi, Israel's Homegrown Electric Car Pioneer: On the Road to Oil Independence



If there's a poster child for Israel's entrepreneurial spirit, start-up Better Place is one strong candidate. Since launching the company in 2007, Shai Agassi -- a 41-year-old Israeli entrepreneur and former executive of software giant SAP -- has been shaking up the auto industry with his vision for mass adoption of zero-emission vehicles powered by electricity from renewable sources. Starting off with \$200 million of seed money, Better Place has since been setting up networks of service stations for electric cars, helping to wean drivers from their environmentally unfriendly gas guzzlers. John Paul MacDuffie, a professor of management at Wharton and co-director of the International Motor Vehicle Program, joined Knowledge@Wharton to interview Agassi from the company's headquarters in California about what it takes to develop an oil-independent future.

An edited transcript of the conversation appears below:

Knowledge@Wharton: You've often said that your inspiration for launching Better Place came to you at the World Economic Forum in Davos during discussion about ways to reduce the world's dependence on oil. But the story of how Israel's president, Shimon Peres, helped you turn that idea into a business is not as well known. Could you tell us about that?

Shai Agassi: I was [at] the Young Global Leaders Forum. I was challenged to think of a problem and then try and solve it. I started with thinking of how ... you run a country without oil. I then prepared a white paper and presented it to a number of governments, [and lastly] I presented it to Shimon Peres. Peres was the only leader who jumped [at] the challenge in the sense of saying, "If it's something that you're serious about, let's go figure out a way to do it." He dragged me by the hand to every government office in Israel and a number of large industrial companies.

At the outcome of this journey that he led me through, we [set several] conditions, which were: If you find the money -- \$200 million -- and if you find a car company that would agree to build a mass production line of electric vehicles according to the model that we described -- the switchable battery car -- then Israel would be the experimental site to deploy and run the model. And he, true to form, helped me find Renault and convince [chairman and CEO] Carlos Ghosn in a meeting that it was the right thing to do, and then worked diligently in Israel to get it done. I offered to do it as a government agency and he challenged me to quit my job and do it as a company, which is what Better Place ended up becoming.

Knowledge@Wharton: How difficult was it to get the support of all the other constituents in government and industry, including the other auto companies? What kind of issues came up that you had to address?

Agassi: It wasn't easy. [People] had a hard time accepting it because there was a risk of betting on something that would not end up being successful. And there was almost no incentive for politicians to make decisions that are big and robust and breakthrough and disruptive. Most of their decisions are continuous developments of things that were agreed to by previous generations. There's always somebody else to blame.

We were lucky enough to have at the time Prime Minister [Ehud] Olmert, who basically said, "If you find the money, I'll fight Israel." What most people don't realize is that he has probably one of the most key individuals who is directly responsible to him -- in this case the director general of the prime minister's office -- to work through the entire bureaucracy of the government. All branches of government touch on our project and he needed that one person to unify the entire government.

Knowledge@Wharton: You have been speaking to other governments as well about reducing oil dependence. What is your pitch to them and how does your experience with other countries compare with your experience in Israel?

Agassi: You have to remember that nobody had done it [before] so it was really hard to convince somebody to be the first one. It's a lot easier to say, "We'll take the Israeli model and repeat it," than it is to be Israel in this case. And in most cases when I talk to governments, the common answer I got was that it's very good that the young generation is thinking about these big problems. And that was it. Nobody was willing to be crazy enough to follow through this model with us regardless of what we asked. And most of the time, we didn't ask for any money. We didn't ask for any budget. We basically said, "Just work with us and we'll get it done." But it was the fear of being caught or being observed as crazy by the media, which put politicians in the position that they wouldn't move.

Knowledge@Wharton: You were quoted recently -- I think it was at a Wired magazine forum -- saying that China is going to be a very important market for electric vehicles. Can you tell us a little bit about what you have been doing in China to make your case for your network [of electric-car recharging stations]?

Agassi: China is now the largest car country in the world. It's the largest producer of cars as well as the largest consumer of cars. It [grew] by almost 20% in the last year. The Chinese have no incentive to protect their existing car industry because they were always looking to leapfrog the global car industry. And they've learned that it's impossible for them to do it with the internal combustion engine because they won't get to the level of quality that the Germans or Americans have gotten to after a hundred years. But suddenly in this new world of electric vehicles, they have the ability to not only leapfrog, but also lead forever in this market. Now, from a historic perspective, you have to remember that the U.S. has built its entire middle class on the car industry. Not only did people become middle class by buying [cars], but also a lot of the people became middle class by working in the car industry or its derivatives.

China is observing that same model to create its own middle class in a country that will most likely end up with the same kind of transportation layer of the West That means China will need to add somewhere around 400 million to 500 million cars in the next decade or two. And so you start to understand that there is a huge industrial effort [which will mean] that China can take over the backbone of the world's manufacturing. And by doing so, [China will] actually pick the market. If they go electric, everybody has to go electric.

Knowledge@Wharton: Another interesting case is India. India already has an electric car, the Reva. And [in July], another new car company called Bavina said that it's going to make electric cars in southern India. Since India imports 40% of its oil, it would seem to be a strong candidate to join your network. What efforts have you made there?

Agassi: India is interesting in the sense that it's not a question of the electric car. It's a question of the electric infrastructure for the car. In India, decisions for infrastructure are taken in a very different way than the Chinese model, which is basically centralized, top-down and very rapid execution from the moment a decision has been taken. When we look at India, we see great opportunity, but we're not sure [about the] speed of execution, whereas the Chinese are already in execution mode, not analysis mode.

Knowledge@Wharton: Would you care to comment on Japan and your efforts there?

Agassi: You're seeing sort of three couples around the world -- China and Japan; the U.S. and the rest of the Americas -- Canada and South America; and France and Germany. On each of the continents, you see one party moving really fast -- [for example] China in the case of Asia -- and one party reluctantly following its OEMs. In the case of Japan, it was [stuck] behind the Prius [hybrid] model that Toyota has led. It's hard to defend the hybrid and we're now seeing Japan racing to catch up with electric vehicles, [while] China is moving on. And you're seeing the same thing in America.

But the starkest example is what's happening in Europe, where France led the conversion to electric due to the development of nuclear power in the past and Renault's position on electric. Germany was held behind by the OEMs, [and] mostly by Daimler and VW. Now that Daimler has bought into [California-based electric car maker] Tesla, and VW announced a partnership with China's BYD, you're starting to see the German government moving to catch up [with] the French regulation and position on electric vehicles.

Knowledge@Wharton: You were able to convince Carlos Ghosn that Renault and Nissan should join in the endeavor. How did that come about and how have the other car companies reacted?

Agassi: President Peres and I met with Ghosn in Davos in 2007. I don't think we convinced Ghosn. He already had the vision that the future of Renault-Nissan is electric. A lot of people tell the story as if I convinced him. Ghosn was more convinced than I was that this was the future, so he deserves the credit. He was an exception in [believing] that hybrids just don't make sense long term -- its dual-drive train, its cost structure is counter-intuitive to everything that was done in the industry. So he took it to the extreme and said, "If we go more electric, let's go all electric."

The problem was that a lot of other CEOs were trying to defend their legacy instead of building for the future. And they did not understand how fast this shift would happen. But we're explaining it to them The main problem we had was trying to explain to some of the car CEOs, the car industry leaders, that an opportunity is lurking in 2011, 2012 as the "house was burning" and they didn't see how they were [even] going to get through the next quarter or the one after. It was not conducive to getting business done. Now that hopefully a lot of them are getting out of this situation ... it's easier to convince them that they've got to build for something in the future.

John Paul MacDuffie: To pick up on that, I am curious to hear your story for the Americas in terms of who is fast and who is slow, just to complete the world survey.

Agassi: One of the things that happened in America was that while we were changing the guard in the White House, Congress and the Senate were relentless in their push for the right incentive plan. So what you're seeing is that in the U.S., we put a lot of money both into the manufacturing and the consumption sides of the equation. We put [Department of Energy] money to [facilitate the] change toward electrification with \$25 billion of the budget, about \$7,500 toward every electric vehicle at the federal level. Some states are doing more. We're seeing a lot of programs in the current proposed energy bill at the

House and the Senate, including financing for mass production, buying batteries [and so on] So there's a whole collection of bills that have been put through the House and the Senate which are coming into fruition and creating a fantastic [opportunity] for electrification.

I'm starting to see it from the manufacturers in Canada, and in particular in Ontario, where Premier [Dalton] McGuinty is leading this effort. [Similarly] in Brazil and some of the other South American countries, their understanding is that if they don't catch up with electrification, they will be left with the old industry, while the U.S. uses its money -- hundreds of billions of dollars -- to shift and rebuild the car industry before it's too late.

MacDuffie: Of course, there are several new entrants in the electric car space in the U.S., like Tesla and Bright Automotive. Have you been in contact with them? Which do you think have promising manufacturing and business models that might coordinate well with your thoughts and your network?

Agassi: It's important to understand that we're solving a very different problem than these guys, as much as I have a ton of admiration for [Tesla chairman and CEO Elon Musk] and the role that the company has played in galvanizing the public's perception that a great electric car can be produced. And [Tesla's] Roadster has been a fantastic demonstration of what technology means in the world of electric cars.

We are trying to solve a different problem, which is: How do you run an entire country without gasoline? To do that, you really need to get a plan that scales at very high volume and low cost. And so while most of these guys have targeted high-end, \$80,000 to \$120,000 cars, we're targeting cars that are below \$20,000. We're targeting the car that will be in that \$10,000 to \$15,000 range, but still give you everything you would get from a middle of the road Chevy Malibu, instead of trying to go to the highest high-end car possible.

If you look at volume, at producers that can produce at the very least ... 100,000 of these kinds of cars per plant, there are very few players like that in the U.S. All three of them [Tesla, Bright, and Fisker] are well known as U.S. domestic makers....

Now the reason I'm saying 100,000 a plant at the very least is that we need something that is replicable, which can then go from 100,000 to a million to 10 million over a period of about 18 months to 36 months, because we have a very short period of time to solve this problem. If you don't get very quickly to a million and then to 10 million, we will not be able to solve the problem of how to live without oil.

MacDuffie: That was one of the things about scaling that I wanted to ask you, so thank you. It seems that one of the ideas that has captured the public imagination most is the battery-swapping stations. Do you think that drivers will be comfortable with leasing their batteries versus owning them? In the early period of the hybrids, there was worry about whether these batteries will have longevity and so maybe leasing looked like a nice way to deal with that concern. But it seems like those concerns are not as strong today. Do you have any sense yet of what the consumer reaction to that idea will be?

Agassi: That was one of the key misunderstandings about our model. We do not lease the battery. We as the operator, Better Place, remain forever the owner of the battery. The consumer does not lease the battery. What the consumer buys is kiloliters. We don't sell kilowatt hours and we don't lease batteries. We're not a financing organization. We're an organization that provides a service, which is unlimited driving at a price on a per mile basis. And we buy kilowatt hours and buy batteries to provide that kind of service through infrastructure, which we put around an entire region. From all the surveys that we've done with consumers who have seen our switch stations, more than 80% said they would rather

own a car without owning the battery or they don't really care about who owns the battery.

MacDuffie: From the perspective of the different vehicles from different manufacturers that would potentially use one of these swapping stations, what's your sense of the likelihood of the OEMs agreeing to standardization [so that] there's one battery type? If a charging station had to stock multiple types of batteries for different manufacturers, the logistics of managing those inventories gets more complicated to avoid running out [of the batteries] or having surpluses at a particular location.

Agassi: For one, we do not assume standardization. We assume that there will be multiple types and sizes of batteries. And we believe that the early movers will most likely decide to go with batteries that are unique to them. As a result, when we start in a region, we will need to decide which cars we service, and continue to service those cars for longevity. The design of the switch station has been one [that deals] with multiple car types and multiple battery types.

At the same time, you have to remember that once the infrastructure is in place, car makers have an incentive to use the batteries that were used by somebody else [given that the volume is already high] in that region. Otherwise they're the ones who are going to need to take care of stocking the extra batteries if volume [is low]. It's the same model that you want with retailers. If you're starting your first shops, then you need to court the original makers to give you some goods to sell; otherwise, the store is empty. But once your store is serving people, it's your shelf space that becomes more valuable than the actual goods from the makers.

MacDuffie: So it's really a pull over time toward standardization when the scale is there and the customers are there?

Agassi: Let me put it this way and you'll get it very easily. We see that model today with gasoline. In the early days of gasoline, if you didn't have oil, you couldn't open up a gas station. The minute you got oil, you went out and you installed gas stations. And then you sold the oil at whatever refining level you had across all these gas stations. Once the gas stations are in the right locations and people like them ... they use these stations. If somebody says, "I have a new fuel" -- let's say a zero-carbon, very cheap, no-emission, no-pollution fuel -- they're more at the mercy of the gas stations than the other way around. They need the gas stations to stock [the new fuel] before people buy the cars that use that fuel.

MacDuffie: I like that analogy. So let me ask a question that's more about battery technology. Do you think it will be stable enough for whatever kind of model -- whether it's for recharging or battery swapping -- in the infrastructure you envision? What's the risk of it becoming obsolete by a big change in battery technology or some other change that would make the infrastructure problematic?

Agassi: One of the things I believe is that huge breakthroughs in science don't happen as miracles. What we'll see in mass production in five to 10 years' time has to be in the lab right now

[In] very few cases can we get from 200 kilowatt hours per kilogram to 300 kilowatt hours per kilogram. That's a 150% to 200% improvement over what we have today, which means we probably are going to see [a similar improvement] in about five to seven years' time if that's what is in the lab. That means we're going to see a battery that will do roughly 250 miles to 300 miles on good days at the same size and for the same cost as what we have today.

The interesting element is if you get to that kind of battery, would you put that battery in your car? [What if] you -- seven years from now -- have a swapping infrastructure across the region [and can] only buy half that battery at half the price and have a price advantage that is more distinguished and gives you a better business model? The answer is most people would rather pay half as much per mile and have a 120-mile battery than those who would buy a 250-mile battery and pay twice as much per mile driven.

MacDuffie: So the emergence of that kind of greater range doesn't necessarily invalidate the plan for the infrastructure [and] current battery technology?

Agassi: Remember the early cell phones -- the bricks -- that had a big battery attached? When that battery technology improved, we didn't keep the same talking time and the big brick. We reduced the size of the phone and put a half a battery in there. Okay? And we kept on doing the same thing again, again and again. It's not that we couldn't keep [the old phone]. Imagine today if we took a brick like the original Motorola phone and put a battery inside. You'd be able to talk forever. But who would buy that phone?

MacDuffie: Let me ask what is a kind of geography question. So far, you've had a lot of enthusiasm from Israel, but also from other places that are relatively concentrated geographies, like Denmark and Hawaii. Is there any sense that that's the most logical starting place for this model in terms of getting critical mass quickly and [needing] fewer long trips in a proximate geography, hence less need for spacing the recharger or battery-swapping stations to support long trips?

Agassi: Are you saying that it's unfair that we picked the best places to start?

MacDuffie: No, I'm just wondering if you see a natural fit for ... relatively smaller geographies as a place to prove this, or if you plan to prove it in large geographies at the same time?

Agassi: I just want to remind you that our third location is Australia. So we went big as well. The rationale in picking Israel and Denmark is obvious. It's a single-cell model, if you want to think of a cell-phone metaphor. Israel is almost like a one-and-a-half cell, if you think of a cell as a radius of about 100 miles from the middle point of the country. And Denmark is not different than that. With the same kind of 100-mile radius from Copenhagen, you reach most of the country. You need half a cell to cover the rest of the country.

The issue is that we can only see multi-cell organisms. If you think of the West coast of the United States, it's basically four cells and a long freeway connecting them. Think of L.A./San Diego as one-and-a-half cells. San Francisco is a full cell. And then Portland is a half cell and Seattle is a one cell. What you see is that you've got four cells and a 1,500-mile highway connecting them. That's one of the models we'll be looking at proving. So we're always in the position that once you've done it in one country, it's very easy to replicate in other countries regardless of size.

MacDuffie: Could you say a bit more about Australia because it is a [location] with vast expanses of very low density. How are you thinking of tackling a country like that?

Agassi: We don't need to tackle all of Australia. That's the beauty of it.... We don't need to do 100% of the cars on day one. Australia has three very big cells: Melbourne, Sydney and Brisbane. All you need to do is cover each one of those cells that are very dense urban centers. If you think about them, there are extremely profitable cell-phone models in each one of those.

So the same thing [applies] to us. We have very dense coverage in those [cities] and then one freeway that connects them that runs, I think, about 1,000 miles. And that highway

gets a switch station every 25 miles, which effectively gives you comfort that you won't get stuck when driving from any of these cells to any of the other cells.

You don't drive 1,000 miles every day. But when you do, you're within coverage. And so you really get an environment where you've got three major, highly profitable centers and a very good connection across all of them.

MacDuffie: You've used the cell phone -- product, business model, industry, evolution -- [as an] example several times. Did that enter into your thinking early on as sort of a stimulus to your vision?

Agassi: It did. It's actually more exiting minds right now than entering. One of the mistakes that we made is we thought of ourselves too much as being a cell-phone company. We're more like an energy company or a modern oil company in the sense that we sell the same product, we sell miles to drivers.... We're more [like] a company [in] infrastructure, which buys its assets and through that, sells a service -- effectively a comfort of driving miles only with sustainable ways both for the economy and [the environment].

MacDuffie: One more general question about the different parts that Better Place is involved with. As I understand it, a lot of the automotive value chain would change under your vision, including design, production, distribution and the way that energy is consumed. How far along are you in figuring out the incentives for each part of the chain to [encourage them to] participate in the model?

Agassi: For car makers, it's pretty obvious. They have a ton of capacity. They're looking at a non-sustainable business model as it is today. We're proposing to them a much better business model -- a highly profitable car that drives for a long period of time with very low warranty costs, and some incentives to work with us and provide us with cars.

We're providing an incentive for the gas-station owners to ... leverage their space by [installing] switch stations inside. We're providing great incentives for the utilities in the sense that we're buying excess capacity [from them], in particular in renewable excess capacity. We're selling them standby power whenever they need it so they've got a great customer who is intermittent and is willing to share its storage, which is a very big pain for them right now. For governments, we provide a way to [rectify] trade balance issues in terms of not importing any more oil.

...Finally, the consumer gets a cheaper car with more convenience, with the ability to drive indefinitely, without noise, without pollution, without killing their future and their kids' future. Overall it's one of the biggest value generators, mostly because we're taking out the implicit and the explicit cost of oil.

Knowledge@Wharton: What message would you like to give high school students about the cars and car industry of the future? And how can they get involved with Better Place?

Agassi: First thing they have to remember is that their first car will be electric. The young generation today understands that ... we don't have enough oil in the ground and we don't have enough of an atmosphere to sustain them until they die if we don't switch early. And the earlier we switch ... the easier it is going to be to recover from what we -- our generation and the generations of the past -- have done to this planet, and the abuse that we've [inflicted on] natural resources And so the first thing to remember is your future is electric.

The second thing is that this is one of the most exciting times in this industry. We will have a billion electric cars on the road sometime around 2025 because we will have a billion people [driving] and there's no way they can be [driving] gasoline cars. Between now and 2025, a billion new cars need to be added and there will not be any industry that will be

more exciting than this one. If you think of an industry that will make a billion of something, [with an average price of] \$20,000, you're looking at a \$20 trillion industry rising up from nothing today within the span of 10 to 15 years.

Those are the kinds of [things] that made Silicon Valley a great place to work and made biotechnology a great place to work and made the Internet such a fun place to be part of in 1995. If they're looking for something that will be the next big industry, there's no doubt in my mind that the electric car is the next big thing and that \$20 trillion is just the core of this industry. There'll be batteries and services, innovation and new product technology. Everything will be reinvented and they've got to think of a way to get into this industry while they can.

Knowledge@Wharton: Is there a way students can get involved with Better Place?

Agassi: We have probably about 15,000 to 20,000 unsolicited resumes. There's always a way to get our attention if they want to and they work hard. I'm sure that down the road when they're done at Wharton, we'll look at their resumes.

Cuil's Seval Oz Ozveren: Creating the Next Generation of Internet Search

As use of the Internet grows and changes, so has the ability of users to search for specific content or stories, photos and videos that relate to certain topics of interest. One of the companies trying to harness and expand the power of search is Cuil, which is developing Cpedia -- an engine that promises less repetition, an encyclopedia-style summary for each search, results that integrate related topics, and input and recommendations from users' social networks. Cuil vice president of business development and finance Seval Oz Ozveren talked about the company's mission, the evolution of search and the creation of Cpedia -- which is still in the "alpha" testing phase -- with Knowledge@Wharton during the recent Future of Publishing conference in New York City.



An edited transcript of the conversation appears below.

Knowledge@Wharton: Tell me a little bit about Cuil, its mission, some of your current services and maybe some that are under development?

Seval Oz Ozveren: Cuil is a search engine that is differentiated from the other two search engines that crawl the worldwide web -- the first being Google, the second being Microsoft -- in that our mission is more about keeping the user on the [search] page. [Our goal is] enabling them to discover content -- related content -- and [creating a] visualization of content so that you can find things serendipitously that you didn't necessarily know you were looking for.

The second differentiator with Cuil is that Cuil has been searching and mining the worldwide web for intersections and long-tail queries in that we think that the next generation of search ought to be about intersections and finding more specific topics that are related to each other, such as, "osteoporosis, hypertension [and] side effects." That is also changing the way in which people use search because it is enabling the user to find more specific information about topics that they are querying.

Knowledge@Wharton: How is a contextual search different than if someone were to visit a traditional search engine, type in those three terms you just mentioned and get back a list of links? What's the difference between that and a more contextual search?

Ozveren: When you type in right now "osteoporosis, hypertension [and] side effects" what Cuil gives you, or tries to give you, is content that you can find on the Web that is percolating to the top, but also related [content, which appears] on the right hand side [of the results page].... [Contextual search] is categories that come up, maybe the actual nomenclature for the particular disease, maybe specific drugs that are attributed to that disease, maybe side effects in medications. The next generation of what we are doing is creating your social network inputs for that, so that if you are connected to Facebook, for example, you get your friends' or colleagues' or peers' views on those topics or related topics. It may not pick up -- someone might not have said something specifically using the

word "hypertension," but they may have said "high blood pressure." So our ability to mine the deep down Web enables us to draw inferences between the pages that exist on similar concepts and understand that those similar concepts are related. And I think the third part of the contextual search is really peer recommendations, which comes from having integrated search results from your social networks.

Knowledge@Wharton: So contextual search kind of bridges the gap between thinking about a topic and not being able to type the right words into a search engine to get results related specifically to that topic?

Ozveren: Exactly. And [discovering that] "Wow. I didn't know that there was a bad side effect [from] a particular drug when I took it for hypertension that might be [causing symptoms] like obesity and hair growth." So a lot of information that you may not expect, but serendipitously find there related to your query.

Knowledge@Wharton: How do you think the question of users' online identity creates opportunities for a search? How does it create limitations?

Ozveren: I think reputation isn't going to exist anymore on the Web. I think we are talking about a level playing field pretty much. Every piece of information that is out there on you is susceptible to being recorded and Tweeted about and coming up [in a search]. But I do think that it is important that people claim identities on the Web going forward. In as much as the Web tries to remain agnostic, you also need to try and claim who you are. And it really is a powerful tool for the individual because there is so much information out there. Your ability to [bring to the] surface information about yourself or your friends or your reputation or the work that you are doing is important to being able to control that channel.

Cpedia -- I'll segway into that because it is a very powerful tool -- is [Cuil's] next or third page of search ... Now we are talking about content that is surfacing automatically through algorithms that generate Web-based content. So it is a summary engine. It is almost like a Wikipedia but the difference between Wikipedia and Cpedia is that [the results are] not user generated. It is allowing other points of reference, which Wikipedia doesn't do. Also, right now if you go to the Web and you search someone like me; I don't have a Wikipedia page. There are only 200,000 active Wikipedia pages out there. That leaves a huge [opportunity to create profiles] for everyone else out there who you can't specifically read something about. Let's say you are going into a [meeting] and you want to read about someone that you are being interviewed by, or talking to. Unless you go to their LinkedIn profile or their Facebook profile, if you are in their network, there is very little information pertaining to them.

But this automatically generated summary [from] Cpedia enables you to find at a blink's notice all the information out there on a particular person. If [results that come up are] not the right person, [Cpedia] tells you it is not the right person. It disambiguates between that person and people with similar names so that you can find the right person. And that's also a problem with the Web right now, that there is so much information out there that people don't really know, "Is that the same Seval Oz that lived in Wilmington, Delaware in 1986?" Well, Cpedia, because it has information access to all that data, tells you that it is. And, in fact, we are finding that enterprise search is a very interesting part of this because now people, including credit report companies and the United States government, are starting to want to have background information on people. So there is other utility that is coming out from being able to mine this data and present this data.

Knowledge@Wharton: Is Cuil's Cpedia product available now, in beta form or for broader use?

Ozveren: Cpedia is a product of Cuil's, that is kind of [expanding on] what we have always been doing, which is data mining. We crawl a billion pages a day on a 120-billion page index. That gives us a huge scale of ability of being able to manage this data. It is a pretty powerful tool to be able to just algorithmically create or automatically generate summary pages.

[Right now] we call it alpha Cpedia because it is version one and like any other version one, it leaves something to be desired in terms of polish.... It is a very, very difficult problem that we are trying to solve, so it takes time. It is not something that is clearly going to be out there as a branded ready product in two months. It is going to take time as people use it and come back with feedback. It works better in some verticals than it does in others. Like its people search is better than product search.... There is a lot of information on the Web that doesn't necessarily surface to the top because maybe people don't want it to. I'm not throwing any jabs at any particular large U.S. conglomerates, but we have a right to know as the public if there are side effects with certain drugs that are being talked about, or if there are certain problems with certain car manufacturers. We want to engage in that conversation. We want to be a part of it. We want to watch what thought leaders are saying about that. We want to somehow feel a part of the experience.

That was the beauty of Facebook. Facebook really created the user experience. People went on to Facebook [because] they just wanted to watch what their friends were doing, feel a part of it and feel connected. And I think the Web going forward is about feeling connected. People use the word "engagement" and people are trying to monetize engagement, but I like to think of it in terms of not necessarily monetization but the connectability of every individual to another.

Knowledge@Wharton: What do you think the evolution of Internet search has shown publishers and companies about what people want to get out of these services? Were there some assumptions about users' habits that turned out to be incorrect?

Ozveren: I think people are finding the power of groundswell movements, especially in America. Every large civil movement in this country has been a grass roots groundswell -- even the election of our President. And if you think about the election of our President, it was mainly done through the Web. His campaign was completely Web-centric.... I also think there ought to be other applications like non-profit foundation search, so you can actually go and search on a search engine that relates to [environmental causes], that relates to the things that you believe in. One of our comments ... has always been "Let's create a blue and a red search engine for Republicans and for Democrats." Then the Democrats can find things that are related to their vision, and Republicans can find things related to their views. I see that potentially happening in the year 2020. So, yes, absolutely search is a powerful tool that people can aggregate ideas -- like-minded ideas -- around. But it also has danger in the fact that if it is not used carefully, if it is not used with a bit of concern over privacy, it can be misused. We need to have controls -- regulatory controls - - and I think you will see Facebook and Google and search engines like ourselves grappling with these tools and making sure that we are not infringing upon people's privacy.

Beyond the Textbook Approach: Building the Classroom of Tomorrow

Using science and mathematics to capture the imagination of young minds, Boris Berenfeld, president and CEO of International Laboratory of Advanced Education Technologies, is a champion of schools around the world wanting to craft a new approach to learning that combines new technologies and bold curricula to bring these topics to life. Berenfeld's London-based consultancy and technology provider seeks to reinvent teaching and learning in emerging fields like life sciences, nanotechnology, engineering and robotics. A Russian-born educator, technologist and biophysicist, Berenfeld spoke to Arabic Knowledge@Wharton about his leading-edge work to develop new ways of classroom learning and the magical ideas that inspire them.

An edited transcript of the conversation appears below.

Arabic Knowledge@Wharton: What inspired you to get International Laboratory of Advanced Education Technologies (ILAET) going?

Boris Berenfeld: About 20 years ago, computers began reaching schools in large numbers, but schools were not prepared to use them. It was very much a marketing push rather than [an educational pull]. For some time, [computers] sat idle in schools, locked in computer labs. Simultaneously, many advanced technologies were trickling down to education technologies from aerospace, the military and other fields....

A teacher or administrator would order 'technology type A' from one vendor and '[type] B' from another; then they had all this stuff, but nobody knew how to integrate all of it. My laboratory was thought up as a large-scale education technology integrator providing turnkey solutions, whether it is a class of tomorrow, Schools of the Future [which is a global initiative to change schools, starting at kindergarten] or our latest development called LearningGrounds.

Arabic Knowledge@Wharton: Can you provide some examples of what you have in mind?

Berenfeld:LearningGrounds is an [extracurricular] "playground" for kids interested in [learning about] science, mathematics, engineering, design and biology. If you feel that a child has an inclination to construct something but you don't catch this child's desires at the right moment, you will lose him -- very often to some dumb computer game.

We had a very interesting example in the Soviet Union in the 1950s. The country, unfortunately for military purposes, wanted to develop a huge number of scientists and mathematicians. I was part of this process because I lived in a small town. One day, a graduate student came -- dressed in jeans, no tie, nothing formal -- and said, "How about having a mathematics Olympiad?" He gave us some problems to solve. It was fun. Those who did really well were invited to a specialized school, and then graduate students and professors worked with those students. It was the beginning of a pipeline producing very bright mathematicians and scientists. You identify kids who love to solve problems. They can be in any neighborhood, in any setting, and you give them a good, fast-track education.

Arabic Knowledge@Wharton: What is the right age at which you start appealing to students using technological intervention?

Berenfeld: Ideally, three or four years of age, but in reality, I would say upper elementary school. [Ages 10 to 12] is a very sensitive period in a child's formation LearningGrounds should be a place that can spur the imagination and provide the technology to enhance self-esteem. Children can also see the different use of technologies -- not just for playing silly games [where the characters try] to kill each other. They can play with molecules and atoms. They can build and construct things. Ideally, every university in the world, every college, should have outreach programs with such facilities.

Arabic Knowledge@Wharton: How do you do the outreach? It is one thing to develop interesting technology and quite another to get it adopted by large numbers of students.

Berenfeld: No matter how rosy I am, it is still about hardware and software. We are talking about US\$2 million at least to make it work. So another set of products that I am developing are two virtual LearningGrounds. One of them is called Global Laboratory. Global Laboratory is based on the premise that learning is fundamentally social. Textbooks will build your vocabulary. But learning occurs when we learn from each other. By being in a community of learners, you feel that you are needed. With Global Lab, every learner also becomes a teacher. Together, the [learners] create new knowledge when they measure and monitor their own environment. They see that knowledge is not what the teacher said; it is what they collaboratively construct.

Another product is NanoSchool. You may remember that in the 1980s, we were talking about information literacy. Why? Because we could foresee the advent of computers and networking on a large scale. Now I am trying to move forward with the concept of molecular literacy. It is a completely new set of literacy, with skills that allow you to see the world around you in terms of atoms and molecules and their interactions. You should be able to explain things in your everyday life in terms of atoms and molecules.

Arabic Knowledge@Wharton: What have the adoption levels been of these education technologies and how do you measure their success?

Berenfeld: In the late 1980s, together with the National Geographic Society and the Technical Education Research Center, a spinoff from Massachusetts Institute of Technology (MIT), we developed a kid's network project. It got students from all over the world measuring the acidity of rain and doing other collaborative investigations. In its peak year, we reached 22,000 schools in 40 countries. Now, with support from the World Bank, I started the Global Lab in Russia. In no time, I got 120 schools, from Khabarovsk to Moscow to Ukraine. When you work together, and when you study and do research together, it is very hard to build an image of an enemy.

Arabic Knowledge@Wharton: How sustainable is your revenue model, especially if you deliver the content online?

Berenfeld: Fundamentally, you should not -- and you cannot -- make money from education. Moreover, you should spend money on education. Unfortunately, it is very hard to measure your productivity. How much will it cost if you make a society 1% smarter? Therefore, we need to charge. With Global Lab, a simple subscription model can help us break even, whether you involve 1,000 or 5,000 schools. You need a moderator for every cluster for this course to be productive. They have online forums and I want instructors to be able to extract everything that the kids are saying in this forum and use it to grade them.

Arabic Knowledge@Wharton: Is this model applicable mainly to scientific education or can it be applied to other areas?

Berenfeld: Certainly to social sciences.... You can teach wonderful subjects that [you don't learn in schools], like ethnography or cultural anthropology. There is a wonderfully small field of science called toponymy, the history of geographical names. With the help of your students, you create maps. For example, we made a map of all the places in the world with the word "hope" in their names. You had New Hope, Hope and Hopeless.

Arabic Knowledge@Wharton: What about languages?

Berenfeld: I don't think you can [apply the technology to languages], because I believe that languages should be taught in context. The first time I came to MIT, they asked if I could give a "brownbag" the next week. Well, I didn't have [an actual] brown bag to give. It took me some exploration to understand that they meant a lunchtime presentation. With projects like Global Lab, you communicate with native speakers in context. You can learn a great deal. I would rather integrate that into Global Lab.

Arabic Knowledge@Wharton: Have you monitored whether more boys than girls are interested in using this, or are able to use it or have access to it?

Berenfeld: I don't have data on gender differences. But Global Lab, with support from the National Science Foundation [a U.S. government agency], had external evaluators from Stanford Research Institute [a nonprofit R&D organization]. They studied the pedagogical effect on Global Lab. If anything, they found a big difference in children's perceptions about themselves, about their curiosity and about their thoughts about future occupations. The importance of international participation was stressed.

One school in San Antonio, Texas, loved Global Lab. After a teacher reported to us that the kids measured acid rain, we provided little devices to measure carbon dioxide (CO₂) levels. Because part of the school was located in trailers, they had pretty high CO₂ levels. The students thought that people might have been getting sick because of the CO₂. They went to different classrooms and measured CO₂ levels, and found a correlation with how many kids and teachers got sick. They made a big fuss and the school called in environmental inspectors. The teacher said the inspectors were very skeptical, but they began measuring CO₂ levels and found the very same data the kids found.

We had a scientist who told them, "You have an elevated level of CO₂. You have an elevated level of respiratory illnesses. You see a correlation. But does this mean a cause and effect? Maybe something else causes both things." They learned a great lesson in that correlation does not mean causality. They eventually understood that a poor ventilation system caused both things -- the illnesses and the high CO₂. They learned not only content, but also science process skills. Eventually, this poor school got an environmental award from the governor of Texas.... I think we could have more schools like that.

Arabic Knowledge@Wharton: What is your dream for what you can do with education technologies?

Berenfeld: I have to admit that I didn't read *Harry Potter*. But I saw the movie. And there is a scene in it when the child is on his way to visit the school and he is in the train station. He walks through a wall and the magic starts. I would feel happy if I could build something like that, where kids go through the wall of education, and then magic begins with technologies and learning.

Aramex's Fadi Ghandour Unfolds His Roadmap for Budding Entrepreneurs in the Middle East



Fadi Ghandour needs little introduction, if any, in the Middle East. The founder of global logistics and transportation company Aramex is arguably the region's best-known entrepreneur, a mentor and role model for many young Arabs, an angel investor, and one who is more than happy to challenge traditional business and social values. Ghandour's accomplishments have been hailed by many, including New York Times columnist Thomas Friedman who wrote in his book, *The World Is Flat*, that every Arab should know the Aramex story.

Established in 1982 as an express operator for the Middle East and South Asia, Aramex became the first Arab-based company to trade its shares on Nasdaq in 1997. It returned to private ownership in 2002 and then went public three years later on the Dubai Financial Market as Arab International Logistics. It now has an alliance network of over 12,000 offices, 33,000 vehicles and 66,000 employees, providing freight forwarding, catalogue shopping, magazine and newspaper distribution and other services.

Ironically, 2009 was probably the best year ever for Aramex. At a time when most companies across the world were battling through the economic downturn, it opened new businesses and reported a 25% increase in net profit for the year. Ghandour's no-assets, no-debt policy helped as the the business environment changed rapidly. Ghandour spoke with Arabic Knowledge@Wharton in Dubai about addressing the region's weak business "ecosystem" and what needs to be done to help the next generation of innovators down the often bumpy road to entrepreneurial success.

Arabic Knowledge@Wharton: What are the biggest challenges to entrepreneurship and innovation in the region? Are they purely economic or are there cultural, social and political reasons?

Fadi Ghandour: I don't think there are any cultural, political or social reasons. They are partly economic and partly developmental, like building a "softer" loan structure, [having an] an ability to easily register companies with very low capital, and securing intellectual property rights. On the other hand, clearly there is a need to have venture capital, angel capital and early-stage capital. There is a business culture, as you might call it, in the region that focuses on oil and gas, government contracts, and trading -- representing overseas companies.

The story of entrepreneurship here is one without an ecosystem of capital, private-sector support and angel investors. There is also no mentoring, which is really important.

Arabic Knowledge@Wharton: You have been a mentor?

Ghandour: Yes, I do that. You are talking to me because I am an entrepreneur and I understand what they do. I am an angel investor and I find that while capital is important, what they need the most is advice. They need time. It is so much more important if you can tell them how to do things, what my experience has been -- all that is not measured in terms of money.

Arabic Knowledge@Wharton: Did you get that kind of advice when you started?

Ghandour: I did and did not. The easiest way of getting a mentor is if your father understands what you are doing, understands business well and is willing to mentor you. I was mentored by a father who was an entrepreneur, but did not have time because he was a traveling man. You have to seek [out mentors]. Some of the networking events, some of the associations popping up for angel investors, etc., are a good step and helpful.

You need to make the private sector and businessmen aware of how important it is for them to give their time. It is like talking to your son or daughter. They need advice and eventually they will run, but you have to help them take those first few steps.

Arabic Knowledge@Wharton: How much time are you able to give them?

Ghandour: Just before [this chat], I was emailing a brilliant lady entrepreneur, telling her that I was traveling but will be in touch to do a conference call. You have to get back to them because they are young. If you believe in this, you have to give it time.

Arabic Knowledge@Wharton: Do you see a lot of young people in the region taking the entrepreneurial route these days?

Ghandour: Yes, I see a lot. The Internet has created all sorts of possibilities that people of earlier generations did not have. [Young people] see what the world is doing. They see the low cost of developing businesses online. They learn from others. There are some businesses that have already been developed in other places, but need to be customized and "Arabized." You will have the copycats and you will have the innovators. That is the nature of the beast.

Arabic Knowledge@Wharton: You once said the governments in the region are like mothers and the citizens are like their spoiled children. Do you see that changing quickly?

Ghandour: (Laughs) Yes, I stick to my position. An overprotective father is going to ruin the future of his child. He will not let him fail [and] he is not going to let him try or expose him to the world. It's a vicious world out there and you learn only when you fail. A mentor, father or mother can tell you a lot of stories, but the best way to learn is to fail. You have to stumble.

Arabic Knowledge@Wharton: But failure is not taken too kindly in this part of the world, is it?

Ghandour: No, it's not. Maybe it is in the U.S., the mother of all entrepreneurial countries. It has created that thing about an underdog. It is easy for people there to fail because that is seen as learning. If you tell people that it's fine to fail but to get [back] up and run, you have to create the ecosystem that helps. Mothers can never take failures, families can't.

An entrepreneur, who has just started, was telling us about what his family had to say about the Maktoob-Yahoo deal [in which Yahoo bought the Arab portal in 2009]. His mother or father said they did not know what Maktoob does, "but why don't you try and

do something like that?" It catches on. It slowly becomes legitimate to try, which means that you don't work for the government or a big company that gives a secure job, but try something on your own. That, by definition, means that it might work or it might not, and possible failure means I am at least trying.

Arabic Knowledge@Wharton: Are people in the region averse to risk because of the fear of failure?

Ghandour: Entrepreneurship is something that is learned. I am a product of that process. Entrepreneurship is not something you are born with. You learn not only by doing, but also by having the skills -- making financial statements, the discovery, logical thinking. This is stuff you have to learn in schools. That's where you get exposed to these things. You can throw somebody in the water and he can only become a good swimmer if he knows how to breathe. You have to give people the skill sets. You can teach people the rules of football and they can understand and enjoy it, but they can only play when they experience it themselves.

Arabic Knowledge@Wharton: How do you find the right idea?

Ghandour: A right idea is a product of exposure, learning and curiosity, which are essential for any entrepreneur. The status quo has to be unacceptable and that's what I keep saying in the organization. I tell people they need to question things. You can always do better by questioning anything that is in front of you. You can do something that is totally different if you have a plan that is acceptable. A new product can change the face of an industry.

Entrepreneurship is all about questioning because that's where ideas come from. You also have to look closely at what is happening in your industry and learn from it. Any technological advancement in an industry can have a huge impact. For example, with the arrival of email, a whole industry around sending letters from one place to another almost vanished.

Arabic Knowledge@Wharton: Do you believe that entrepreneurs have only one good idea and tend to lose interest in innovation once they have achieved the first goal?

Ghandour: No, there are many serial entrepreneurs. They exit one thing and start another. It depends entirely on your skills, exposure and mind. I started my business 28 years ago, but I do a lot of intra-department entrepreneurship. But there are some who make their money and go on a vacation. Human beings make their own choices. You don't always have to be an entrepreneur.

Arabic Knowledge@Wharton: What are the better entrepreneurial stories in the region?

Ghandour: You have Orascom, which is a fantastic story, Maktoob, Consolidated Contractors Company - one of the biggest [diversified construction firms] in the world today -- and Rubicon, one of the best animation companies. The region needs more but there are examples and role models. We need to document and celebrate them, and make people aware of them. There is nothing to be ashamed of in highlighting entrepreneurship stories in the region.

But the more relevant story to our youth is the small entrepreneur. You don't need to be worth hundreds of millions of dollars. At \$2 million or \$3 million, you can create jobs and value that is attainable. I don't want to scare people [by saying] entrepreneurship is about creating mega companies. It is about innovating the value and product you offer. You create wealth for the people who work for you, and [for] yourself.

Arabic Knowledge@Wharton: Are governments in the region doing enough to encourage entrepreneurship?

Ghandour: No, they need to do much, much more. They need to start with education, the regulatory environment and the enabling environment putting up seed money. The Arab world is facing a huge challenge of unemployment and the only way you can create jobs is by partnering with the private sector so that it becomes a public-private partnership. All those young people graduating from universities need to become job creators. That means creating companies and changing the tradition of working for governments.

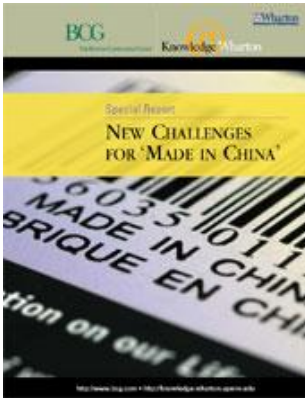
Arabic Knowledge@Wharton: What are the three things you would tell a budding entrepreneur?

Ghandour: I would tell them they are in it for the long run, watch out for your cash and find a mentor. Finally, stop complaining. Don't worry about government regulations. Go and do it. I know it is an issue, but it should not stop anyone. Just do it, as Nike would say.

Chapter 2:
**Perspectives on Innovation in
Emerging Markets**



China's Growing Talent for Innovation



As a business innovator, China has a wealth of advantages. These include a huge, adaptable population with an affinity for improvisation and reverse engineering; low-cost labor, operations and overhead; and mature industrial clusters ready to supply a variety of parts, components and subassemblies. These elements are creating a strong culture of innovation, one that companies from developed economies soon will either profit from, or compete against, as China moves beyond labor-intensive, low-value-added consumer goods.

Already, many large multinational corporations (MNCs) have set up R&D centers in China, and the government is encouraging the development of design capabilities among its workforce. But China is not an easy place for outsiders to be innovators. Companies from developed economies looking for R&D partners in China must learn to operate within an industrial structure quite different from their own, and take great care in selecting whom to work with and how, experts caution.

MNCs are likely to find that the best opportunities for harnessing Chinese-style innovation lie in two areas: discrete, targeted pieces of larger products and products for home-market consumption.

In this article, part of a special report on Chinese manufacturing, experts from The Boston Consulting Group (BCG) and Wharton look at how companies can profit from Chinese innovation, what drives this innovation, and what challenges they face in sourcing R&D in China.

Global Recession's Role

Jim Andrew, a senior partner and managing director in BCG's Chicago office and head of its global innovation practice, says that in the current recession, companies need to ensure that they are getting full benefit from every dollar they spend -- including their investments in innovation. Andrew sees growing innovation in low-cost countries such as China and India as one way for companies to increase the cost-effectiveness of their innovation spending. "The crisis in the developed markets has accelerated the move to developing markets because they are lower-cost and now have a track record," he says, noting that the changes afoot are redefining the innovation landscape. "We will look back on this time and say it was an inflection point with regard to the speed at which certain innovation activities were scaled up in China and India in particular. There is really a step-function change in the rate at which some of these activities are growing."

Innovation in China before its economy opened up was limited to design institutes that were part of government departments, says David Michael, a senior partner and director of BCG's Beijing office. Some of institutes have since been repurposed for new commercial goals. Such is the case with the state-owned oil company PetroChina, which has a large network of design institutes within it, according to Michael.

MNCs now realize that China has tremendous development capabilities, including the ability to size up opportunities and rapidly bring products to shelves at low cost. The availability of well-educated talent is particularly attractive, Andrew says. "You can access that talent to do a lot more of the 'R' (research) that is increasingly relevant not just to China's domestic markets but to developed markets." For MNCs that set up R&D centers in

China, "It is more about accessing talent rather than some unique source of innovation," Michael notes. That makes innovation in China substantially different from that in other global hubs such as the Silicon Valley. "There is low-cost engineering talent in China, but that's different from saying that there is a whole fountain of innovation we can tap into," he adds.

This raw engineering talent is a valuable resource for companies from developed economies. The best way for MNCs to tap into Chinese design skills is by sourcing select pieces of their product, Michael says. As is true for contract manufacturing, much of the advantage of Chinese R&D is in low-cost labor -- but for brains, not brawn. "When Western or world-class business practices line up with low Chinese costs, new types of companies develop to take advantage of this opportunity," he notes.

In health sciences, for instance, some Chinese companies are already responding to Western research needs with low-cost services. Michael offers WuXi PharmaTech in Shanghai's Waigaoqiao Free Trade Zone as an example. WuXi, a leading provider of contract research work for the global pharmaceutical industry, has become adept at setting its engineers to work on Western pharma projects. "It's run by people who understand the needs of Western pharmaceutical companies and know how to leverage local engineering talent to do the work."

This kind of division of labor is common in such East-West partnerships. Western companies typically tap into Chinese design for parts or modules, Michael says. One global energy company gets "a lot of its design for oil exploration and drilling facilities in China at the local oil companies' design institutes," he notes. Microsoft and other Western and Korean gaming and software development companies have a network of local software developers. Michael also points to Perfect World, a Chinese gaming software writer that "is booming in the 3-D world." It may not be a household name in the United States or Europe yet, but Perfect World is a leader in the country's online game market, according to Morgan Stanley Research.

Development Attitude and Disruption

Such industry specialization is common. Corporate R&D in China tends to focus on specific industries and on product development rather than basic research, says Marshall Meyer, a Wharton management professor whose research focuses on China. "You see successes in China in machine tools and lasers, but it has been a combination of development and marketing more than basic research."

Chinese companies have been good at the "D" (development) part, Andrew says. "You could grow very large very quickly by playing in existing markets if you developed new products that were just a little better than everybody else's. But with increased competition everywhere, it takes products and services that are more innovative and targeted to needs that are not already being met." One recent example is a soybean blender that produces a popular soy milk drink. Joyoung Co. in Jinan, China's Shandong province, manufactures the blender, which has become "a big hit product." The blender has no fancy technology -- just a plastic body with an electric motor, but its "fundamental concept is what local consumers want," he says.

More dramatically, according to Michael, Taiwanese computer manufacturer Asus used its development capabilities to "single-handedly invent the netbook segment of the PC market." Producing computers stripped down in functionality and priced at \$300 each, Asus "has completely disrupted the global PC market." As existing markets become saturated, however, China must invest more in the "R" part of R&D to compete differently or to expand into fundamentally new markets, Andrew says. And while piracy has eroded profit opportunities in China's traditional gaming software industry, Michael points out that

it has not similarly affected online games. "People are paying for the experience of playing games with each other, and that turns out to be profitable despite some piracy."

Longer-term, the capacity to innovate seems likely to grow. "The culture is very, very good at devising quick and often effective solutions to problems," Meyer explains. "I see a lot of improvisation." An increasing demand for a Chinese language card in computers, for example, prompted Lenovo years ago to create one for its products. Chinese white-goods manufacturer Haier found that potato farmers in China were using their washing machines to clean produce, so it designed a heavy-duty, special-purpose machine that can be used outdoors and will "wash your clothes or your potatoes," Meyer notes. Electronic and electrical manufacturers often design products that work with "very heavy-duty power supplies because of the poor quality of electricity" in the country.

Nor are Chinese innovators focused entirely on their domestic market. According to David Jin, managing director and head of BCG's Shanghai office, some Chinese companies have already tried to out-innovate large MNCs -- and succeeded. In one highly publicized case in 2006, Chinese electrical products maker Chint won a lawsuit over its patent for a circuit breaker against the Chinese unit of the French company Schneider Electric. "Usually, it is the other way around," Jin says, alluding to Western companies accusing those in developing countries of patent infringements. Many high-tech operations are succeeding abroad as well. China Medical Technologies, a supplier of in-vitro diagnosis and treatment systems, competes with MNCs and commands a market share of more than 90% in at least one product segment and 70% in another, according to a July 2008 report from Citigroup Global Markets.

Choosing a Business Model

For companies in developed economies that want to harness Chinese innovation, Wharton and BCG experts say it's important to select the right business model. These models range from plain-vanilla purchasing through a series of one-off orders, to joint technological collaborations through supplier development programs, to taking an equity position in Chinese suppliers, says David Lee, partner and managing director in BCG's Beijing office and a supply chain and procurement specialist.

No one-size-fits-all formula exists for such partnerships, Lee adds. He has seen several MNCs invest in their suppliers, but "a lot of them don't like the idea," in part because of potential management disagreements. Some Chinese companies "are reluctant to change the way they have worked historically," he says, adding that the handling of human resources and material waste, in particular, could be points of friction. However, many of them have begun reining in waste of materials in manufacturing processes and increasing wage levels have got them to focus on lean manufacturing and productivity enhancement, he adds.

Many MNCs have rolled out supplier development programs, transferring pieces of technology and attempting to transfer their best practices to Chinese partners. But this, too, is unfamiliar territory for some. Companies from developed economies typically haven't had to worry much about quality control in their home markets "because suppliers themselves take the initiative to invest in quality-control processes," Lee says. Markets are so competitive and dynamic in China that innovation is likely to continue relentlessly. Companies are being pressured for ever more gains in productivity. And where Chinese manufacturing wages were relatively flat for many decades -- allowing wage productivity to grow -- labor markets have tightened and wages have started rising, Michael points out. The challenge going forward will be to accelerate productivity growth ahead of any inflationary pressure on wages, he says. The available labor supply in the medium term will not be as large as it was in the past -- although the global economic slowdown has idled

millions of workers for the moment. But the release of large blocks of talent through the restructuring of state-owned enterprises is almost complete. At the same time, rising farm incomes -- at least until very recently -- had constrained the supply of migrant rural labor to the industrial centers, Michael explains. That gave labor more leverage. Ultimately, as labor increasingly absorbs more manufacturing resources in the long run, companies will have to push even further for innovative solutions with "a focus on driving more productivity increases in Chinese operations." The global economic downturn will likely slow the pace of these trends -- and even reverse some -- in the short term. But over the mid-term and beyond, expect China to build upon its already substantial innovative capabilities in manufacturing and services.

Innovation and Intellectual Property

Does porous intellectual property protection have a negative impact on innovation? Not necessarily, says Harold Sirkin, senior partner at BCG in Chicago and global leader of the firm's operations practice. When you innovate, "you're creating a brand, and that's a different kind of intellectual property (IP) than a patent." IP protection is growing less important to innovation, even in the West, Sirkin notes. "The world has gotten so small that even if you invent the next iTunes, you can't rely on patent protection," he notes. "It's readily copied now, everywhere. A lot of the [market appeal with] iTunes and the iPod is about [their] installed base."

However, innovation and protection of IP have long been connected, and China has duly noted that linkage in its attempts to transform itself from a low value-added manufacturing center to recognized innovation leader, particularly as lower-cost countries compete for China's core business. Mike Chao, a Principal at BCG in Beijing, notes that, "The IP laws have always been there, but what's changed in the last 20 years is how they have been interpreted and enforced. There's a big difference between policy and enforcement." One notable example is the software industry, where Chao battled piracy with Microsoft China for over five years before joining BCG. After strong lobbying by Microsoft in partnership with the US government, China declared in 2003 that the government would only use legal software. That announcement was followed by two additional decrees requiring that PC manufacturers only preinstall genuine software and Chinese enterprises only use legal software. "While that's absolutely a step in the right direction, there's still work to do in terms of bringing up the levels of enforcement and awareness to comply with the policies," Chao says.

On another front, however, he notes the Chinese government's tendency to provide research grants to projects that have the same time frame as the tenure of bureaucrats, thus sacrificing long-term horizons for short-term gains. "Innovation requires a long-term approach, and companies need to know their hard work won't just be stolen right away." Therein lies the difference between betting the company on the "R" or the "D": "Research is never a sure thing, but development can consistently result in realizable output," Chao explains. "With the recently announced government stimulus programs, there is hope that more funding will go to the companies that can actually productize that research and bring it to market." Academic institutions that have traditionally received such grants have "not had a great track record in commercialization," Chao points out.

Evolving IP policies, however, will not necessarily be the savior to spurring a wave of innovation in China. "At the end of the day, the market will force you to innovate and differentiate, and if your company isn't doing that, someone else will." Chao points to the PC industry as an example. Prices of notebook computers dropped 13% on average in China last year, in large part due to pressure from netbooks, other low-cost offerings, and a general lack of differentiation. "Asus saw an opportunity to disrupt the industry with the netbook, and now PC companies are dropping prices and scrambling to catch up."

Innovation is and has always been the key to competition. China's ability to do so effectively will undoubtedly determine its future in the global economy.



When to Gamble – and When to Fold?

Innovation Strategies for a New Economy



In the world of business innovation, it's not always best to be first. Just ask trailblazing mobile communications giant Motorola, which in the 1980s and 1990s spent a whopping \$7 billion to achieve the ambitious goal of a global, satellite-powered phone network -- only to find the costly technology was outdated when it finally arrived.

According to Scott Snyder, a senior fellow at the Wharton School's Mack Center for Technological Innovation, a Motorola engineer dreamed up the idea for the Iridium satellite project in 1985, when his wife was unable to make a cell phone call during a trip to the Bahamas.

After the engineer, Barry Bertiger, sold his bosses on the idea of a network of 77 low-orbit satellites offering subscribers virtually global coverage, it took more than ten years to make the ambitious idea a reality. During that period, the number of mobile phone subscribers and earth-based cell phone towers soared, while prices for digital phones plummeted. By the time the Iridium project came online in 1998, Snyder said, there was little demand for "a phone the size of a billy club" that cost \$1,000, with conventional mobile coverage that was now almost ubiquitous. The \$7 billion satellite network was sold for \$35 million, which Snyder called "a lot of value destruction."

"The lesson here is the set of assumptions we make a long term bet on ... are very fragile," Snyder noted at the recent conference, "Creating and Managing Innovation Portfolios: Improving the Allocation of Scarce Innovation Resources," which was organized by the Mack Center.

Deciding when to gamble on a new and unproven technology -- as Motorola did successfully with the very first cell phone in the early 1970s before failing spectacularly with its Iridium boondoggle -- and when to adopt a more conservative research and development strategy that simply upgrades what is already on the marketplace is key to creating and managing a so-called "innovation portfolio."

Companies that succeed in this area are not necessarily the ones who bring products to the market first. For example, Apple has a reputation for cutting-edge innovation, thanks to best-selling products such as the iPod music player and now the iPad tablet computer. But as Wharton entrepreneurship professor Karl Ulrich, pointed out, "We think of the iPod as being the first digital music player, but actually it was about 50th." Apple also waited years -- studying the pros and cons of its rivals' models -- before introducing the hugely popular iPhone, which thrived by improving upon applications offered through existing mobile phone technology. Simply put, Ulrich argued, introducing a brand-new technology is "hugely overrated."

Just as the blunders by the large financial traders on Wall Street led to greater scrutiny and a call for better planning and more balance in traditional investment portfolios, the difficult economy has also cast a spotlight for inventive companies on the notion of innovation portfolios. Firms are re-evaluating not just how much to spend on research and development, but also how to strike a better balance between long-term, high-risk projects and more incremental efforts. In addition, businesses are trying to focus on initiatives that best leverage the company's talents and niche in the marketplace, and

developing new ways to track trends and come up with strategies for changing course if a particular effort isn't panning out as expected.

Finding the Right Mix

According to Paul J. H. Schoemaker, research director of the Mack Center, the aftershocks of the financial crisis have caused many companies to look more closely at the concept of an innovation portfolio -- that many firms had "a false sense of comfort" in their earlier strategies that has now been shaken up. Furthermore, the decrease in revenues at many businesses since the 2008 slowdown has led to fewer dollars being allocated for high-tech research, making strategic decisions even more critical.

Past research has shown that, overall, people tend to be fairly conservative with investment opportunities that don't come with guaranteed rewards, Schoemaker noted. One such study showed that a majority chose a certain gain of \$240 over an investment with just a 25% chance making \$1,000, but a 75% chance of zero return. The same researchers found people were more accepting of risk; a larger number would accept a 75% chance of losing \$1,000 (with a 25% chance of no loss) over an assured loss of \$750. But Schoemaker pointed out that mathematically, people who make the opposite choice in those two scenarios make out slightly better.

"Why do the majority of people take a pairing that's inferior?" Schoemaker asked. "The reason, I think, is because we don't think in portfolio terms.... We look at decisions in isolation of other decisions. We look at this one as its own thing, and that one as its own thing, and we don't adopt a portfolio view."

In addition to a better understanding of the possible risks and rewards of research and development decisions, Schoemaker and other speakers stressed that sound management of a firm's innovation portfolio also means simply developing an inventory of projects, eliminating duplicative efforts and understanding which ideas best match up with the firm's core competencies, and which do not.

Ulrich divided innovation projects into three categories -- short-term "Horizon 1" initiatives that might be a new application for an existing product; middle-term "Horizon 2" efforts that might feature an inventive new use for existing technology and Horizon 3, which is inventing a radical new product or process that did not exist before.

According to Ulrich, with the exception of Motorola's introduction of the earliest cell phone, companies that bring a brand-new idea to market generally do not become leaders in that sector, which is why he believes companies should be cautious about investing too heavily in the Horizon 3 projects.

Instead, Ulrich suggested that successful companies can today either copy groundbreaking inventions from their rivals, or buy up innovative small companies, and thus reduce risk. He noted that despite Apple's reputation as an innovation leader, the firm actually spends less than the industry average on research and development.

Planning for the Best – and Preparing for the Worst

Still, Ulrich added that strategies for building an innovation portfolio will vary dramatically across industry groups -- an idea that was seconded by conference speaker Daniel Zweidler, who developed innovation strategies for Royal Dutch Shell for more than two decades before moving to pharmaceutical giant Merck, where he is senior vice president for global scientific strategy-portfolio management.

In switching from the oil and gas field to a leading pharmaceutical company, both Zweidler and his bosses initially focused on the similarities between the two industries. Over time, however, Zweidler began to see sharp differences in the strategies needed to succeed in each field. At Shell, a successful decision to explore a particular oil field typically led to a long and stable period of positive cash flow, assuming there were no major political upheavals. But at Merck, the launch of a new drug increasingly leads to only short bursts of market leadership because of intense competition.

"Exclusivity [to sell a particular drug] in the 1970s was about ten years, meaning it was ten years before the second entrant comes in," he noted. "Right now, the second entrant usually comes in two and a half years later. So you have to do whatever you can from a scientific standpoint" to stay ahead of rival firms.

Zweidler also stressed that it is increasingly important for companies to think globally when developing an innovation portfolio, although that can mean different things in different businesses. In oil and gas, for example, it was vital to understand the political situation in each country, including those with a potential for nationalizing oil wells and thus destroying investment value. In the pharmaceutical business, however, a worldwide perspective means thinking of products for new markets such as China, where changing eating habits and increasing obesity is expected to cause a surge in diabetes cases, and where per capita spending on health care is also likely to rise dramatically in the coming years.

The Mack Center's Snyder also focused heavily on global, political and social trends when he was asked by the U.S. Navy to develop a strategy for which energy projects it would invest in over the coming years. It is often overlooked, Snyder noted, that the U.S. military -- in particular the Navy, which has large fleet of more than 285 active ships and more than 3,700 aircraft -- is a massive user of fuel oil and other forms of energy.

The issue for the Navy in developing the proper innovation portfolio, Snyder found, was that planners must make judgments on what the world will look like a decade from now. He called such scenario planning the "missing link" that enables a large firm or entity to develop the right balance of technology investments.

For example, Snyder and his co-workers prepared four basic scenarios for the Navy. One highlighted a "green" future in which government and consumers accepted and encouraged more uses of alternative energy. But the others offered up worlds of political gridlock and dwindling supplies of fossil fuels, with steeply higher prices, as well as increased rivalries and warfare among nations, which would raise energy demand in an era of curtailed supplies. Once the array of possible decisions that flowed from each scenario was taken into consideration, Snyder's team ultimately handed Navy officials 46 different options for innovation portfolios.

Whatever course that the Navy selects, Snyder added, it's critical to monitor the ever-changing world, and to make adjustments mid-stream. Harkening back to Motorola's satellite fiasco, Snyder noted, "They had assumed there would be large areas of the world where Iridium would have exclusive service and where people would pay \$800 to \$1,000 for a phone. If they had been monitoring that proliferation [of conventional mobile phones], at what point would they have said, 'We've got to exit this investment, or change the shape of it, or bring in a partner to share the risk.'"

Taking the 'R' out of BRIC: How the Economic Downturn Exposed Russia's Weaknesses



Last June, when Russia's president, Dmitry Medvedev, gathered fellow BRIC heads of state -- Brazil's President Luiz Inácio Lula da Silva, India's Prime Minister Manmohan Singh and China's President Hu Jintao -- in the central Russian city of Yekaterinburg for the group's first-ever leaders summit, he called for those present to "create the conditions for a fairer world order ... a multi-polar world order."

Medvedev's rhetoric is a giveaway to how, at least in some quarters, the BRIC concept, first put forward in 2003 by analysts at investment bank Goldman Sachs, has evolved from one of economic shorthand to one of political posturing, primarily against American superpower dominance. In a similar gesture, Medvedev dedicated significant air time at the summit to calling for a diversification of world reserve currencies away from the dollar - a point about which China, which holds some \$2 trillion in dollar-denominated reserves, remained silent.

Ever since BRIC was first postulated as a way to group those large, fast-growing emerging markets that, at the time anyway, were expected to be the main engines of world economic growth in coming years, observers have wondered which other countries might have BRIC characteristics. Certainly, there is an ever-growing list of countries being promoted for their BRIC-like qualities to attract international business and investment interest. Goldman Sachs, in a 2005 follow-up to its first BRIC report, put forward its so-called "N11" -- or Next 11 -- group of BRIC aspirants, including Bangladesh, Egypt, Indonesia, Iran, Mexico, Nigeria, Pakistan, the Philippines, South Korea, Turkey and Vietnam.

But now many experts question whether the once promising BRIC label has begun to lose its luster -- especially in the case of Russia. Last year, Russia's economic performance was the worst among the BRIC economies by a large measure: For the whole of 2009, its real GDP is expected to have declined by at least 8% and some quarters by more than 10%. That compares to Brazil's smaller real GDP decline of 5.5%, while China's and India's GDPs grew by 8.3% and 6.5%, respectively. Russia's performance is even worse when compared to 2008, which takes into account the bursting of the oil-price bubble in the middle of that year.

Oil and Other Risks

Russia is the world's largest producer of oil and gas, which is the primary source of its power but also a significant source of economic risk. According to Witold Henisz, a management professor at Wharton, oil and gas are "both a blessing and a curse" for the country. Unlike other major emerging economies, such as Korea, Russia hasn't had to aggressively seek its revenue. And because it has never made a clean break from its feudal past, economic -- and political -- power lies in the hands of a few. This has reverberated throughout the country, Henisz says, bringing with it a "tendency toward centralization, control and coercion."

Although the severity of Russia's economic decline has been due to several factors, Ira Kalish, director of global economics at Deloitte Research, says that the obvious beginning was the bursting of the oil-price bubble in mid-2008. This sharply curtailed export revenues and made the country's foreign debt obligation loom much larger than it had when oil prices were heading toward \$150 a barrel. Then the worldwide credit crunch squeezed the government's debt position even further and, in turn, percolated into Russia's domestic financial sector, leaving several large institutions in need of bail-outs. Rising interest rates to support a collapsing ruble completed the vicious cycle, leading to even tighter credit and further declines in foreign currency reserves.

Still, while oil prices fell by more than 70% from their 2008 peak, they recovered during 2009 to an average price for the year that was above that of 2007 and well above the average of most of the last decade, when Russia's economy was still growing at a healthy clip. Furthermore, although about 65% of Russia's export earnings come from oil and gas, the sector accounts for only about 20% of overall GDP. Other more oil-dependent economies, such as Kazakhstan or Saudi Arabia, suffered much smaller GDP declines over the same period.

So why has Russia done so poorly compared with its BRIC counterparts, as well as other oil-rich emerging economies?

The reason is "a combination of corruption, poor governance, government interference in the private sector, and insufficient investment in the oil and gas sector," says Kalish. These problems and others -- such as erosion of civil liberties -- will continue to stymie growth unless they are tackled aggressively, according to experts.

Even if there were the will to change, solutions are not obvious, says Wharton professor of legal studies and business ethics Philip Nichols. Consider corruption. "In most countries, the mistrust generated by corruption leads to disengagement from government institutions and the creation of relationship-based networks," he says. "In Russia, you do find these networks and they are quite strong, but they are not as pervasive as in the other BRIC countries. In fact, [in Russia,] in the absence of trust it seems that people often turn to the government for direction. And so it seems that corruption ... has the odd, and indirect, effect of further concentrating power in the government."

Nonetheless, Nichols also sees some change in the right direction, including among the country's small and mid-sized enterprises (SMEs), which he has been studying over time. "In the early 1990s, [SMEs] mostly talked about the deal they were working on and maybe the next deal, but rarely looked ahead," he notes. "Now, they talk about their businesses in terms of years. They understand that this requires a sustainable, trustworthy business environment, and that they themselves need to act in trustworthy ways."

More Red Flags

As for the future business environment, Russia's Ministry of Economic Development put forward some fairly optimistic economic growth forecasts at the end of 2009 for the 2010-2012 period. Growth in GDP would be as high as 3.1% in 2010 and 3.4% in 2011, assuming oil prices continue to climb, and GDP growth would rise back to pre-crisis levels by 2012 as foreign investment returns and the domestic economy rebuilds stocks.

The forecasts were quickly dismissed by others, including leading Russian economists. The immediate prognosis for the economy is highly dependent on external factors, argues Sergey Aleksashenko, director for macroeconomic studies at the State University-Higher School of Economics in Moscow. Furthermore, too rapid a recovery -- which might occur if there is another oil price surge -- would be bad for the Russian economy, he says. That would lead to a strengthening of the ruble and foreign currency reserves, an influx of

speculative capital, inflation and the strong likelihood of another collapse and an even more severe recession than the one that took place in 2009.

Another red flag that Aleksashenko raises is that Russia's government could be disinclined to follow the healthiest path for recovery -- that is, a long steady one -- ahead of presidential elections in 2012, when former President Vladimir Putin (currently prime minister) is hopeful of a return to the top job.

This highlights the most persistent problem for Russia: its institutional weakness, something that was evident in the dithering over last year's stimulus package, which at 4% of GDP was large by international standards but which was not implemented until late spring because of worries about stoking inflation further. Thus, in the first half of 2009, according to a report by the Economist Intelligence Unit (EIU), Russia had the humiliating distinction of joining the Ukraine and Zimbabwe as the only countries suffering from both a double-digit output decline and double-digit inflation.

Since the fall of communism two decades ago, the Russian business landscape has gone through a turbulent transition that is still nowhere near complete. Corruption, bureaucratic morass and the often arbitrary enforcement of rules have taken their toll. Yet its oil and gas riches are so vast that very large companies still are willing to pump in billions in foreign capital for huge projects -- including BP, Exxon Mobil and Royal Dutch Shell -- despite having been burned on several occasions. "Just by virtue of its size, it deserves continued attention from the investment community," says Henisz.

Inflows, Outflows

But Western companies, on the whole, are wary and have been more inclined to seek less volatile environments for their investments, as was especially evident during the downturn. A case in point: Carrefour. In October, the French retailer -- the second largest in the world after Wal-Mart -- pulled up stakes in Russia, citing bleak short- and medium-term prospects for growth. The move was a surprise given that just months before in June, it had cut the ribbon on its first hypermarket in the country.

That episode underscores not only the fragile investor confidence in the country, but also the difficulty that Russia faces in developing other industries that can reduce its heavy reliance on oil and gas. Outside that sector, the opportunities are "very limited," Henisz notes. "Russia does have the capacity [to develop other sectors] -- there are a lot of engineers and the education level is high. But we're not seeing many entrepreneurs who can develop large service or manufacturing companies. There's a massive gap between the small entrepreneurs -- who want to stay off the tax and political radar screens -- and the oligarchs."

With oil and gas clearly continuing to be a dominant force, Medvedev's new world order for BRICs is perhaps best illustrated in early 2009 by the "oil-for-loans" deal between Russia and China, when the latter arranged for its China Development Bank to lend \$25 billion to Russia's Rosneft and Transneft oil companies to build pipelines and secure oil deliveries for the next couple of decades. Russia has been looking to diversify its markets away from the West, while China has aggressively sought to secure energy resources from as many sources as it can.

The oil-for-loans deal also underlines the potential for friction between these two BRIC members. While the BRIC summit was getting under way in Yekaterinburg in June, there was a simultaneous gathering in the same city of the Shanghai Cooperation Organization, made up of Kazakhstan, Uzbekistan, Tajikistan and Kyrgyzstan, as well as China and Russia. While the meeting may have been billed as a further display of independence from the West, Russia and China have competing interests in how these energy-rich countries bring

their oil and gas to market. China -- which pledged \$10 billion in economic stabilization loans for the Central Asian countries at that meeting -- has the upper hand.

Another destabilizing factor is the effect of concentrated ownership in the hands of a few billionaires, and the risk of capital flight from this small group, which has happened on more than one occasion and leaves the economy open to sharp and volatile outflows of capital during hard times. In the final quarter of 2008, as the financial crisis deepened after the collapse of Lehman Brothers, \$164 billion flowed out of Russia's capital account.

The shortcomings of Russia's ruling political and business elite are by now well known. What's more, the warning signs of more economic trouble ahead are growing -- for example, the increasing rate of non-performing loans on Russian banks' balance sheets. Experts say that strong leadership would be required now to stabilize the financial situation and, more than anything, to encourage foreign investment and management expertise to help steady Russia's economy. But the prospects of that happening soon are slim. For the time being, according to Henisz, "the path forward is looking a little darker" for Russia.



How Group Dynamics May Be Killing Innovation



To come up with the next iPad, Amazon or Facebook, the last thing potential innovators need is a group brainstorm session. What the pacesetters of the future really require, according to new Wharton research, is some time alone.

In a paper titled, "Idea Generation and the Quality of the Best Idea (PDF)," Wharton operations and information management professors Christian Terwiesch and Karl Ulrich argue that group dynamics are the enemy of businesses trying to develop one-of-a-kind new products, unique ways to save money or distinctive marketing strategies.

Terwiesch, Ulrich and co-author Karan Girotra, a professor of technology and operations management at INSEAD, found that a hybrid process -- in which people are given time to brainstorm on their own before discussing ideas with their peers -- resulted in more and better quality ideas than a purely team-oriented process. More importantly for companies striving for innovation, however, the trio says the absolute best idea in a hybrid process topped the Number One suggestion in a traditional model.

"Manufacturers prefer 10 machines with good output over one very good machine and nine really defective ones. You would rather have 10 good salesmen than nine poor salesmen and one superstar. In those areas, what matters is the total cumulative output, the total picture," Terwiesch points out. "When it comes to innovation, however, what really matters is not getting many good ideas, but getting one or two exceptional ideas. That's really what innovation is all about."

Although several existing experimental studies criticize the team brainstorming process due to the interference of group dynamics, the Wharton researchers believe their work stands out due to a focus on the quality, in addition to the number, of ideas generated by the different processes -- in particular, the quality of the best idea. They say the research is also distinctive in its study of how teams select the most promising initiatives that come out of the brainstorming phase.

"The evaluation part is critical. No matter which process we used, whether it was the [team] or hybrid model, they all did significantly worse than we hoped [in the evaluation stage]," Terwiesch says. "It's no good generating a great idea if you don't recognize the idea as great. It's like me sitting here and saying I had the idea for Amazon. If I had the idea but didn't do anything about it, then it really doesn't matter that I had the idea."

'The Boss Is Always Right'

Forty-four University of Pennsylvania students were recruited to help test how the two processes fared. The undergraduate and graduate students were divided into groups of four and asked to employ the hybrid process and team process separately to come up with student-friendly new product concepts for a hypothetical sports and fitness products manufacturer and for a hypothetical home-products manufacturer. Teams were given 30 minutes to brainstorm using the traditional group process. To test the hybrid model, they

were asked to spend 10 minutes generating and ranking ideas individually and 20 minutes discussing those thoughts as a group.

The ideas generated by both methods were evaluated independently, by three separate panels asked to evaluate the product ideas on their business value; attractiveness to potential customers and overall quality based on the feasibility of actually building the product; the idea's originality; the size of the potential market for the product, and the extent to which it solved a particular problem. The students came up with a total of 443 ideas -- including a trash can that reduces the odor of the garbage inside it, a water bottle with a built-in filtration system and a waterproofing system that allows for reading in the shower.

Business leaders trying to integrate innovative ideas into their office culture can learn from the structure and intricacy used to generate and evaluate the ideas, suggests Terwiesch. He and Ulrich are also co-authors of the book, *Innovation Tournaments: Creating and Selecting Exceptional Opportunities*, which suggests that companies should use coordinated competitions to filter the most exceptional proposals. He says an online system that creates a virtual "suggestion box" can accomplish the same goal as long as it is established to achieve a particular purpose. "People like having a process because they understand that it's fair. In a typical brainstorming meeting, it's not fair and everybody knows it: The boss is always right," Terwiesch says.

Imposing structure doesn't replace or stifle the creativity of employees, Ulrich adds. In fact, the goal is to establish an idea generation process that helps to bring out the best in people. "We have found that, in the early phases of idea generation, providing very specific process guideposts for individuals [such as] 'Generate at least 10 ideas and submit them by Wednesday,' ensures that all members of a team contribute and that they devote sufficient creative energy to the problem."

The results of the experiment with the students showed that average quality of the ideas generated by the hybrid process were better than those that came from the team process by the equivalent of roughly 30 percentage points. The hybrid method resulted in about three times more ideas than the traditional method. In addition, the quality rating was higher for the top five ideas produced through the hybrid process -- and the difference in quality between the team and hybrid methods in terms of the best idea was much higher than the average difference in quality, suggesting that "in an innovation setting, examining only [average] quality as opposed to the quality of the best ideas is likely to underestimate the benefits of the hybrid approach," the authors write.

Terwiesch says notions spawned through an individual brainstorming process are valuable thoughts that must not be "killed too early because of group dynamics. Your initial thoughts are very vital to the company because they are your unbiased opinion."

Self-Censorship and Build-Up

There are several reasons why people are less likely to offer an unbiased opinion in a purely team-based brainstorming process. Employees might censor themselves to go along with the status quo or to avoid angering a superior. Putting several people in a room together is bound to create a lot of conversation; if everyone contributes, there is less time for individuals to share all of their ideas. Some people may think less critically about a problem because they are happy to let others do the heavy lifting.

"We're fighting the American business model where everybody is [creative], which is just not the case," Terwiesch states. "We find huge differences in people's levels of creativity, and we just have to face it. We're not all good singers and we're not all good runners, so why should we expect that we all are good idea generators? But it's not politically correct

to say so, even though there is more to being a good businessperson than generating ideas."

In addition to idea quality, the researchers also tried to measure one of the predispositions of group dynamics that they believe creates a roadblock to innovation -- build-up, or the tendency of people to suggest ideas similar to one that has already been proposed, and embraced by, the unit. They found that ideas built around other ideas are not statistically better than any random suggestion.

Build-up, Terwiesch believes, "is a social norm showing that you listened. If a group is working together on an idea that's already on the table, you're wary of coming in with your own agenda because you might be seen as selfish and not a team player. So you build on the idea that is currently on the table."

But that kind of thinking is what keeps the team from doing the kind of "sky's the limit" thinking that leads to the development of a product or process that hasn't been seen before. "Instead of searching the world broadly, we are all kind of searching only in this little sphere," Terwiesch says. "In innovation, variance is your friend. You want wacky stuff because you can afford to reject it if you don't like it. If you build on group norms, the group kills variance."

Decoding the DNA of Brazilian Multinationals



In recent years, companies from emerging economies -- especially the BRIC nations (Brazil, Russia, India and China) -- have challenged the hegemony of multinational giants from the U.S., Europe and Japan in what has been called the "third wave" of globalization. Brazilian multinationals, with their own unique attributes, are leading the charge. Last year, the Boston Consulting Group ranked 14 Brazilian companies among the world's 100 "new global rivals."

Nowadays, Companhia Vale do Rio Doce (in the mineral sector), Petrobras (in petroleum) and Embraer (in aerospace) are the strongest and most recognized companies outside Brazil's borders. These firms have moved abroad as a result of changes in the internationalization process that began in the 1990s, when there was a considerable increase in foreign direct investment (FDI) in Brazil. This occurred in other Latin American countries, too -- but in the case of Brazil, the trend was especially strong. During that decade, the annual average investment volume was US\$1.048 billion. By 2006, the volume of investments had risen eight-fold to US\$8.20 billion.

In addition to investments, there is a lesser-known globalization process within the companies themselves, "whose management model is based on an inventive combination of organizational competencies and management systems." That is the conclusion of a recent study in the *Universia-Business Review*, titled "The road moves forward: The path of Brazilian multinationals."

Colonial Roots

The authors of the paper -- Alfonso Fleury, professor of engineering at Sao Paulo University; Maria Tereza Leme, dean of the Getulio Vargas Foundation (FGV-EAESP), and Germano Glufke, professor at the FGV-EAESP -- studied 30 corporate headquarters and 68 Brazilian subsidiaries, and engaged in 12 in-depth case studies in order to identify the genetic make-up of these multinationals, and the factors that explain their competitiveness in global markets. They argue that you have to look deep into the country's Portuguese colonial period for the origins of "Brazilian-style management." According to the authors, that heritage consists of the following:

- ✓ A centralization of decision-making in upper levels of management, with a misalignment between responsibility and authority.
- ✓ Short-term vision, focused on short-term results and on solutions for dealing with crises.
- ✓ A lack of strategic planning and significant gaps between strategy and operational execution.
- ✓ A reactive management style which place a high value on creative improvisation.
- ✓ An interest and admiration for managerial practices imported from other countries.

The situation that predominated until the end of the 1980s was characterized by a domestic market that was protected by the government and strongly influenced by its political decisions. "This contributed to the creation of a parochial mentality; an approach to business that was not very entrepreneurial and was dependent on local institutions and,

as a result, excessively directed toward the country itself, so that it lost sight of the global perspective," the authors write.

It was not until the 1990s, with the arrival of the government of Fernando Henrique Cardoso (1995-2003), and then that of Lula, that there was a series of significant changes aimed at the stabilization of the economy (and the control of inflation), as well as the opening of the market. These governments "opened up the market to foreign products and expanded the level of its global competitiveness," the researchers note.

The Basis for Internationalization

As elsewhere in Latin America, the beginnings of this decade were marked by the prospect for trade deregulation within the so-called Washington Consensus -- a combination of economic prescriptions whose goal was to promote economic growth in the region. During that period, for example, there was the privatization of state enterprises such as Petrobras and Embraer; the consolidation of the capital goods sector, with mergers and acquisitions such as the beverage company Ambev/InBev; the denationalization of the durable goods sector, a process in which various companies were acquired by foreign multinationals -- including Sabó (auto parts) and Weg (electrical equipment), which wound up being more competitive and better positioned for international markets.

In practice, the result of this entire process was the stratification of Brazilian companies into leading companies and those that followed them. "Among private companies, those that stood out were the ones that really developed competency at surviving and prospering competitively in the turbulent domestic market, fighting hand-to-hand against the subsidiaries of multinationals," the authors write. In the case of the state-owned companies, "the privatization process injected new competencies (especially in finance and marketing), which complemented their strong competencies in production and technology, and established new horizons for taking action."

At the same time, the creation of the Mercosur trade agreement (which includes Argentina, Brazil, Paraguay and Uruguay) in 1991, served as a new realm for experimentation, and contributed to developing a vision, among administrators and entrepreneurs, of a more globalized world. On the other hand, the researchers note, "the managerial development programs offered by Brazilian institutions gained new status abroad, and won significant positions in the specialized international rankings." These changes laid the foundations for the process of internationalizing Brazilian companies.

A Broad Profile

These days, Brazilian multinationals have a presence in a broad range of activities no longer limited to the exploitation of natural resources so characteristic of companies in emerging countries. Apart from companies in that sector, there are outstanding providers of basic supplies, such as petrochemical maker Braskem; construction materials providers such as Tigre and Duratex; and Odebrecht and other firms that focus on technical services for engineering.

Brazil's process of internationalization was generated independently. The companies made their own decisions and developed their own strategies. "There was not any cooperation among the companies in the industrial sector; or between them and financial institutions (as in the case of Spain); and there was no assistance from the government (as in China)." Nevertheless, privatized companies stand out among the biggest multinationals in the country.

Like most other firms that serve multiple markets in Latin America, Brazilian companies were late to internationalize themselves -- waiting, in many cases, for decades after the companies were established. "There were small movements in the 1980s, but the process did not intensify until the end of the 1990s." In the beginning, Brazilian multinationals made Latin America their goal. This was the most natural route because of the geographic distance and the cultural and institutional differences between Brazil and regions outside Latin America.

Unlike the first multinational companies that made it a priority to seek new markets or access to new resources, companies that were "late movers" in emerging nations such as Brazil were involved in "a mix of activities that take place simultaneously and, from the beginning, also encompass a search for assets that is strategic and efficient. There is also a range of ways that these companies became international, including new acquisitions as well as joint corporate shareholdings and alliances."

Some of these players have been motivated to expand by the recent formation of "networks of global production." As the authors note, such networks, "by requiring an international presence, induce companies to make the effort at globalization. Typical examples are Sabó, Embraco (which manufactures refrigerator compressors), and companies in the information technology sector."

Management Model

The trend toward trade deregulation and the questioning of prevailing business models began, thus uprooting the foundations of the parochial management style. As a result, numerous Brazilian companies learned about the challenges that they had confronted throughout their history. They developed a new managerial model that served as the basis for their internationalization. Among the competencies they acquired, the researchers note, the following stand out: Organizational flexibility as a function of the characteristics of the market and the economic situation, versus the Brazilian tendency to establish hierarchies and centralize; and active waiting, or constantly monitoring conditions and preparing yourself so you can give immediate answers, as opposed to the traditional approach of focusing on short-term planning and intuition.

In addition, many companies developed first-class production processes, strongly influenced by Japanese models. They acquired world-class technical skills and, in some cases, new strengths in R&D. They have learned to focus on their customers, and developed new competencies in international finance and risk management. As for human resource management, these multinationals are the most advanced companies in the country, although they continue to have lots of problems addressing personnel issues that are the result of globalization.

In the laborious road toward internationalization, multinationals have been acquiring other skills such as marketing and international innovation, as well as competencies in running international networks; that is to say, "intrinsic corporate skills for managing, utilizing and exploiting inter-corporate relationships," the authors write. Finally, they add that such firms have also learned to adapt themselves to the demands of institutions and markets, and have attuned themselves to issues concerning social responsibility.

Beyond this new managerial style, which has yet to mature, are the specific advantages of Brazil, aside from its natural resources. Among these, note the authors, are institutional conditions, specialized labor forces, and access to technological knowledge. Some companies have also benefitted from their relationships with the government. Others "have taken advantage of characteristics of the domestic market to develop their own skills, which have enabled them to move into global markets."

Embraer stands out among the multinationals that have changed their managerial model, having transformed itself from a state-owned company into a market-focused company with “long-term planning and a business model sustained by multiple inter-cultural collaborations,” which include risk-sharing partnerships, joint ventures and acquisitions. The company currently operates regional plants and offices in North America, Europe, China and Singapore.

Another case, the authors note, is the ‘intra-entrepreneurial’ culture of Odebrecht, “a company that is in an expansionary phase. It has established its own managerial practices, such as the Odebrecht Entrepreneurial Technology, the company’s fundamental principles. This system of planned delegation grants autonomy to subsidiaries so that they can adapt themselves to local conditions.”

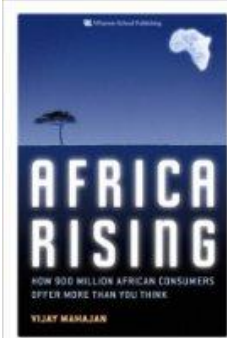
The Road Ahead

According to the authors, the quality that stands out as unique among Brazilian multinationals is their managerial model. Traditional roots, such as hierarchical structures, continue to play a role within many companies. During the internationalization process, these characteristics have been revealed in different ways. One example is the adoption by some companies of mechanisms for avoiding uncertainty and risk; that is, their preference for making exports over making foreign direct investments, and their emphasis on choosing those foreign markets that are similar in appearance. Another example is making individualized – rather than cooperative – decisions to internationalize. A third is the trend toward an ethnocentric positioning, which gives priority to managers at corporate headquarters, to the detriment of local managers.

In that regard, the study points out that managers at the headquarters of Brazilian companies provide incentives for the entrepreneurial spirit in their subsidiaries, but they do not make any great effort to integrate [the various divisions], and they give little autonomy to their subsidiaries. “In this context, subsidiaries take the initiative, especially those that operate in competitive markets and are supported by networks of international companies.” These characteristics, write the authors, “seem to be very favorable [for Brazil] because they reveal the skills that Brazilian administrators have for adapting to new cultures, and their ability to produce creative and innovative responses to conditions that could not possibly be more turbulent.”

The authors conclude by noting that the foundations of the Brazilian managerial model are still in a developmental phase, even if those foundations are quite visible. “How quickly they mature will depend how quickly leadership acts, and on the demonstration [of other leading companies], which can bring new groups together on the same journey.”

“Walk the Market”: Tapping into Africa's 900 Million Consumers



When multinational companies want to tap into the massive pent-up consumer demand in emerging markets, the first countries that they usually think of are China and India. But what about Africa, asks Vijay Mahajan, author of *Africa Rising: How 900 Million Consumers Offer More Than You Think* (Wharton School Publishing). Though often overlooked in global corporate growth strategies, he argues, Africa as a whole has enough consumer power to give China and India a run for their money.

Having returned from various fact-finding missions, he uses his new book to dissect the vast, complex markets of Africa, starting with a look at the home-grown entrepreneurs who have overcome political, economic and social barriers to grow and innovate. For multinationals, particularly those facing shrinking revenues from other emerging markets affected by the global economic downturn, the lessons are timely.

The topic isn't entirely new for Mahajan, a marketing professor at the University of Texas in Austin. In 2006, he was co-author of *The 86% Solution: How to Succeed in the Biggest Marketing Opportunity of the 21st Century* (Wharton School Publishing), a look at how companies can reach the vast majority of the population in countries with a per capita gross national product of less than \$10,000. In an interview with Knowledge@Wharton, Mahajan talks about Africa Rising.

An edited transcript of the conversation follows.

Knowledge@Wharton: What is the market opportunity that Africa offers? And why do so many companies tend to overlook it?

Vijay Mahajan: Your first question is the heart of the book. Like most of us, I did not realize until I started working on the book that the population of Africa -- at about 950 million -- is comparable in size to the population of India. And if you look at growth rates, the population could be equal in size in a few years to the population of even China.

The next point is about market opportunity. Are there consumers in Africa who have the resources to buy products like consumers in India and China do? The fact is that the GDP of Africa -- that is, looking at the continent as if it were a sort of United States of Africa -- is actually higher than India's. If all the countries in Africa combined forces, they would be the 10th largest economy in the world, one notch above India, and ahead of the other big emerging economies, Brazil and Russia.

In terms of market opportunity, the data I was collecting was so intriguing that it drove me to visit Africa and to speak with a range of companies there, from local entrepreneurs to U.S. and European multinationals. And at the end of the day, I was convinced that the market opportunities in Africa for all kinds of products are similar to the market opportunities that you see in places like India.

Why has Africa been ignored? That has puzzled me. When I travelled from Southern Africa to Northern Africa, I was surprised that I didn't see more U.S. or Western European companies than I did. One U.S. multinational with an exceptionally big presence is Coca-Cola. It has been there more than 90 years. Another company with a big presence there is

Unilever, the Anglo-Dutch consumer goods producer. So while there are some multinationals, it's not to the same extent as what I saw in India and China when I was researching my previous book, *The 86% Solution*.

The other thing is that here in the United States and in other developed countries, we get nothing but bad news about Africa in the press. Not to criticize CNN, but you know how badly the Africa that is portrayed in the media like CNN is. The CEOs I was interviewing were so happy that, for the first time, a professor from America was interested in learning about what they were doing.

But it could just be a matter of time. When I started working on *The 86 Percent Solution* 15 years ago, I used to hear the same stories from many Indian and Chinese entrepreneurs.

Knowledge@Wharton: Africa is clearly a large market, but it is obviously not a monolithic market. How is the market structured across the different countries?

Mahajan: The market is not different from any other developing country. After speaking with a lot of advertising agencies, multinationals and local entrepreneurs, I decided that there are three major groups in Africa, which I refer to in the book as Africa 1, Africa 2 and Africa 3. The terminology is actually taken from an Indian entrepreneur mentioned in the book.

Africa 1 comprises between 5% and 15% of the population of each country. These people could be from anywhere in the world. They may be senior government officials, expats, people working for [non-government organizations], people working for large, international banks. This segment was not as interesting to me as the others.

The segment that really was interesting is what I call Africa 2. People in this segment are neither poor nor rich; this segment comprises average people living from month to month. They may have some savings. And you can guess that these people are civil servants -- hardworking nurses, hardworking teachers and so on -- or work in the hospitality industry.

This segment has very high aspirations. These people believe Africa is going somewhere, and they are upbeat. I spend a lot of time in the book on what a big opportunity Africa 2 is. The size of this group is between 35% and 50% of a country's population, the equivalent of between 350 million and 500 million people. Divide that number by 5, which is the average size of a family in Africa (in the U.S., it is 3; in India it is 4).... So there is a very viable Africa 2, which is really going to drive the economy and the consumer markets.

Now, Africa 3 -- the remaining 35% to 60% of an African country's population -- is the one that is struggling. These are the stories that you typically hear about. But that number is not any different from other developing countries. After all, there are 700 million people in India and 750 million people in China who do not have access to a toilet. What's interesting about Africa 3 is that many of them work for Africa 2 and Africa 1, as maids and the like, and they aspire to perhaps one day be part of Africa 2.

Knowledge@Wharton: Would you be able to give a few examples of innovative, home-grown firms or burgeoning sectors that have identified opportunities in Africa?

Mahajan: One example of a remarkable firm is a company in Kenya called Mabati Rolling Mills. The name is the Swahili word for the rolled metal roofing that many Kenyans use for their houses. For people in Africa 2 and Africa 3, one of their main goals when they save some money is to build a house. So they build one room at a time, which may take years to complete. And they need a roof -- that is, the 20 to 30 roofing sheets they need, which they will slowly buy, two or three at a time. You will often see people transporting the sheets on top of a taxi or balanced on two bicycles. Mabati's entrepreneurs saw that need and the company is now the dominant manufacturer of the \$180 million metal

roofing market in Kenya. It's also continuously updating its product lines, and now exports to around 50 countries world-wide.

Then there's the film industry. For example, Nigeria's Nollywood makes more movies than India's Bollywood in India and Hollywood [in the U.S.]. The quality, of course, is questionable. And many countries do not have cinemas, so every Nollywood movie is available only on tape, not even DVD or CD.

Another burgeoning area is cosmetics or personal-care products, keeping in mind that African women are not any different from women anywhere else. While many multinationals have not tailored their products as much as they could to suit African consumers, locals have, and so you will see a lot of local hair products.

There's also a big market for used, or second-hand, products. When you or I change our mobile every two or three years, we do not even think about where it might end up. Actually, the used mobiles from Europe and the United State often go to Africa.

And interestingly, death, too, has a role to play. Although it may not be openly admitted in many of these countries, death is often a celebration. Many people use their savings if someone close to them dies, and they host a wake or what have you. You can imagine when a whole community is invited. So some companies have been set up to cater to those occasions.

Knowledge @ Wharton: You mentioned Coca-Cola and Unilever. What are multinationals doing to serve the underserved markets in Africa?

Mahajan: In the last chapter of the book, I talk about "ubuntu", a Zulu word meaning, "I am because you are." In other words, we are in this together. Desmond Tutu uses the word to evoke harmony. And I tried to give it a business twist. The way I see it is that companies cannot exist unless they take care of their employees and they take of their customers.

A case in point is Coca-Cola. It has distribution centers in almost every nook and cranny of the continent, whether it means transporting their goods on buses, on donkeys, on bicycles or by whatever means. Why not use that network to distribute condoms? So Coca-Cola has been working with NGOs like Population Services International, based in Washington, D.C., to help deliver condoms to parts of remote parts of Africa.

Unilever, meanwhile, is involved in HIV initiatives that I saw in Southern Africa, which are very different from other initiatives. There they have focused on the orphans of families where both the parents have died because of AIDS. Unilever helps to find adopted mothers to raise these children.

Beyond ubuntu, something else that you see at successful multinationals in Africa is a very clear understanding of consumers. They know that they have to do more on this continent [than in other developing countries] given the spectrum of the consumer they have to deal with.

Knowledge@Wharton: Given your marketing background, what struck you most about marketing in Africa?

Mahajan: I often saw kids buying a bottle of Coke, which is expensive, and they would put the bottle right in the middle of the table so everybody can see it, and they would have enough glasses out to share that Coke with friends. It is an aspiration product. Aspiration also is an important element that I saw in many of marketing campaigns.

Another thing to keep in mind there is that Africa has a young population. A little more than 40% of the population is younger than 15, compared with about 30% in India. That's why the use of sports in advertisements is very predominant. So is music.

Knowledge@Wharton: What about pricing strategies? Do they address Africa 1, Africa 2 and Africa 3?

Mahajan: Something I had seen in other developing countries was the predominance of the "lowest coinage strategy". So when you and I buy a bottle of water here, we pay whatever we need to pay -- sometimes \$1 or at airports we might be paying even higher. You would find that bottled water there from multinationals, such as Nestle. But the local entrepreneurs have developed products that they sell at the lowest monetary unit, which, for example, in Nigeria is 5 naira. But the water might not be sold as it would be in developed countries, and many times it may not be filtered water. It may be the tap water, but they sell it in a small plastic bag.

Now, who is buying that? In many cases, it could be people standing in front of a mosque or a church or a temple and asking passersby for money. Because it's so hot, they cannot go the entire day without water. Some entrepreneurs figured out that that they could sell water to these people, at the lowest currency.

Knowledge@Wharton: What are the major hurdles that you found, political or otherwise, that companies face?

Mahajan: When I was there, I made a point of not talking to any politicians or any chambers of commerce. I figured that politics is not any different than in India and China, and I wanted to avoid that. Putting aside all the rules and regulations, I wanted to see how companies are able to still get close to Africa's 950 million consumers.

I saw some very creative solutions. For example, one of the most interesting companies that I studied was Innscor, a fast-food restaurant chain from -- of all the places -- Zimbabwe. But the interesting thing I discovered about this company was how they are able to cope with their country's turmoil by, for example, expanding into other parts of Africa.

Then there's its crocodile farm, the largest in the world. I asked Innscor's executives: "You have the restaurants and you also have a distribution channel used by multinationals to ship their products, so why this crocodile farm?" The answer was that because of the political situation, they realized that they would not have access to foreign currencies. So the crocodile farm, you can guess -- the skin is sold to Europeans and the meat to Chinese.

Knowledge @ Wharton: You referred to China and India. In both countries, there is an overseas diaspora that gets actively engaged in the development efforts of the homeland. Did you find the same sort of phenomenon in Africa as well?

Mahajan: Yes, diaspora is involved in Africa. According to estimates based on formal and informal remittances, Africa gets about \$40 billion a year, the same amount that India gets. And there are organizations, such as one in London called Recruit Africa, which has been set up to help African emigrants find jobs. But in the book, I make a plea to the African diaspora to really get more involved.

Mo Ibrahim, the founder of mobile-phone company Celtel, is part of the diaspora. He was originally from Sudan, educated in Alexandria, got his Masters and PhD in England while working for British Telecom, and then started the mobile phone company in Kenya. And it is a fascinating story -- how he dealt with no electricity, how he provides customer service to all these rural areas, and so on.

He is just one example of many from the diaspora who are returning home to start up companies. The university in Ghana, Ashesi University College, was started in 2002 by a Ghanian, Patrick Awuah, who was part of the diaspora. He was a former software engineer at Microsoft and has created a very nice undergraduate university.

The person who was the head of Coca-Cola in Africa when I was finishing the book, Alex Cummings, is part of the diaspora. He is from Liberia, came to the United States to get his education, and now he has been promoted to chief administrative officer for the entire company at its global headquarters in Atlanta.

There are an estimated 100 million Africans living away from home. But the immigrants who are still connected to their homes -- like the immigrants from India and China -- are sometimes very innovative. I've been seeing some very clever ways that the diaspora is involved in talent, in helping their families to start businesses back home.

Knowledge@Wharton: What advice would you give to companies that want to tap into Africa?

Mahajan: The advice that I am going to offer is not any different than what I would offer for India and China. I met with some very interesting Unilever executives when I was in Harare, Zimbabwe, and they told me that if you really want to understand Africa, you have to go on "consumer safari". You have to go and see with your own eyes what is going on. A Coca-Cola executive in Kenya also gave me the same advice. And that's not always the case. Many companies, they said, manage their Africa businesses from their headquarters in Europe. If the top management is not there, they do not really understand the market themselves, and they do not get involved with the local institution. So the good advice that I was given was to "walk the market".

I would encourage companies to turn to that diaspora for help in penetrating those countries. To my great surprise or ignorance, I found out that the number of immigrants from Africa to the U.S. is close to 1.1 million, which is slightly less than from India. Also, 10% of the population from North Africa is in Europe now. So you are talking about 100 million North Africans, and 10 million of them are in Europe, sending a lot of money back home. There is also a lot of talent there.

Another thing I would suggest is to think about making acquisitions. There are many local entrepreneurs who are running remarkable companies, just like China and India. For example, there's a supermarket chain in East Africa called Nakumatt. It's just like a U.S.-style supermarket, but customized and it is growing very rapidly. If somebody wants to go into retailing, I would see Nakumatt as a very nice candidate that they could leverage to really penetrate those markets.

The situation in Africa is not any different from India and China. You have to really get to know that continent and see for yourself what opportunities exist there.

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