

**A Strategic Perspective of Innovation**

by

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# A Strategic Perspective of Innovation

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Following is the text of an interview with Prof. C. K. Prahalad, Paul and Ruth McCracken Distinguished University Professor of Strategy at University of Michigan, Ann Arbor, MI, a renowned author and advisor to Fortune 50 executives, and the IJIS Editor-in-Chief Praveen Gupta in Oct 2009.

Publisher is thankful to Prof. Prahalad for sharing his wisdom of innovation with readers of the International Journal of Innovation Science.

**PG:** Where does America stand in innovation compared to other countries? Is innovation helping America turn around from the recession?

**CKP:** Historically, America's success has been due to innovation. If you look today, there is certainly a lot of innovation, but it is in pockets. For example, the social networks business, and in personalization of services such as "search" or "music" or "video" America is still very innovative. Companies like Google, Facebook, and Apple are still a very American phenomenon.

But then there is a question: Are we equally innovative in other areas, such as healthcare, education, or environmental opportunities or manufacturing? I am afraid that the answer is so clear.

America is not only less innovative, but we have been losing to others in the rest of the world. For example, look at the development of new applications at the convergence of the industries between telecom and financial services. Poorer countries are building new applications much more rapidly in financial services, based on cell phones.

So I think United States is cutting edge in some areas, staying put in some, and lagging behind in some others.

And why is this? The elements representing traditional strength of American industry – financial services, healthcare and certainly education and manufacturing – have in the last 15 years underinvested in innovation, and lost many of their core competencies. This is particularly true in manufacturing, because of the shift of manufacturing to Asia. In some areas such as "green business" opportunities, we have not invested much at all.

It's not that moving abroad is the problem, but shifting to outside vendors so that companies don't do their own innovation is the real issue. You can get the benefit of lower costs in China, but totally outsourcing manufacturing slowly takes away the capacity to develop and design as well as the "manufacturability thinking" in the company.

If you look at the current debate on how to get out of this recession, the singular missing point is that there is very little discussion about innovation. You don't see it in the political debate, in the managerial debate, or even enough in the prominent business periodicals like BusinessWeek, Fortune and the Wall Street Journal. You don't see it in business schools either. It is all about cost cutting, it is about trimming fat, but not about rethinking.

**PG:** Why aren't business schools teaching innovation?

**CKP:** There's a lot of confusion about what innovation is. Is innovation 'technology,' or 'the number of patents you have,' or 'the capacity to build new business models'? Is it entrepreneurship and management?

In the United States we have historically associated innovation with R&D investment and patents. But there is overwhelming evidence in the last 20 years that demonstrates that almost all our great innovative companies have become innovative not because of the size of the R&D investment, but due to the creativity and entrepreneurship of the people, and their capacity to combine different technologies to create new functionality for the consumer.

Napster demonstrated that there are 45 million American kids who will download music, but they were not paying for it because there was no way to pay. They wanted to have the freedom to enjoy music their way. iPod solved that. But iPod could have been created by Sony. Sony knew miniaturization, they knew

device technology, and they also had Sony music so they knew what kids liked. But they took the attitude that downloading digital music one song at a time is piracy rather than understanding the changing behavior and expectations of consumers. It required changing existing business models and building new tools to enable the young consumers to enjoy music. Their attitude was “defend the status quo”. They wanted to continue to stay in their zone of comfort.

To enable the entrepreneurial capacity to see opportunities and develop the ability to build new business models, you need to first destroy your existing business model, including distribution channels and pricing strategy. The idea of buying the whole CD to listen to one song is just the old fashioned way. If you don't kill your own business model, somebody else will.

The same thing is happening in video. It's Blockbuster vs. Redbox and Netflix. It is an interesting debate on which one is going to work. Is video distribution going to be kiosk based, or is it going to be mail based, or a combination of Kiosk and mail and download to your computer or to your home TV?

The same thing is happening to the publishing (books) business. Is it going to be a proprietary standard like Kindle? Or are going to work on any platform and be agnostic to the platform, which is what Barnes and Noble is trying to do? Or is Google and Apple are going to be a part of this market?

The point is that there is a fundamental transformation taking place in every one of these industries. Therefore, innovation and entrepreneurial drive by leaders is critical at this time. We have to define innovation broadly – beyond technology to include access to customers a total think of the business model. Understanding the impact of “digitization of information and convergence of technology” may be more important than just thinking in terms of R&D investments.

Your question was about business schools. The reason that it is difficult to teach innovation is that it requires a deep understanding of technological trends, consumer evolution patterns, *and* new business models. It is the integration of all three that is required.

**PG:** President Obama is trying to turn around the economy, but little seems to be happening. How could he mobilize people to engage in innovation? I was thinking that in Michigan we should train a million people to be innovators, and unleash the power of people to create new businesses. What do you think of that idea?

**CKP:** I think that what is actually happening in the Tri-State area of Michigan, Ohio and Indiana could be a blessing. The auto industry has been very high tech, so a lot of bright engineers are suddenly unemployed. They don't have the certainty of a job in GM, Ford or Chrysler or any of the Tier 1 suppliers. But they are not going to sit around and do nothing. They are going to turn to new ways of thinking and they have to become entrepreneurs by necessity.

So if we can make it easy for them to access capital, and provide the kind of support structure that is required to create entrepreneurs, such as teaching them how to write a business plan or understand a term sheet I think we will see a revolution happening in Detroit. What I have in mind is to combine mentoring capabilities on a massive scale with access to seed funds and help with developing business plans, so that the engineering resource let go by large companies could become an extraordinary source of entrepreneurship and innovation.

These engineers are innovative and they have done technology development in a large corporate setting. Now they have to learn to do it in a startup mode. But the startup mode is not all that easy because you cannot be an expert in a narrow technology. You have to integrate multiple technologies to create new functionalities. In a large corporation there are a large number of highly specialized people who work in a coordinated way, but the startup culture is what they need to learn.

**PG:** You mentioned that most businesses are focusing on cutting cost, so how do you convince executives they should innovate to grow revenue instead?

**CKP:** It helps if you think in terms of three simple ideas –

1. What are the new sources of revenue? What determines our ability to continuously generate growth?
2. If we want to improve our margins we have to provide continuously unique experiences for consumers, so the ability to generate growth by differentiating ourselves and creating unique experiences is key.

3. Many innovations may not just improve your revenue streams but dramatically reduce your costs and capital intensity. Emerging markets may be a new source of radical innovations.

Let me give the concrete example of the net book. The initial work was done to build a laptop for poor people in countries like India, but it has been a tremendous success in the US, with more than two and half million units sold.

Another example is GE's EKG machine. It costs \$10,000 and weighs sixty-five pounds. Then they wanted to do one for rural India, and after two years they developed a product which is equally good, weighs only 3 pounds, can be carried anywhere, is battery operated, has a printer attached to it, and sends a wireless signal and thus transmits the EKG results to any hospital. So at stage one we have a standalone unit for \$10,000 and at the next stage by going to a poor country and experimenting to serve the bottom of a pyramid, understanding the constraints, we have a better product at 3 lbs in weight for \$800, and it's networked. Big improvement.

If you are interested in dramatically improving your margins, and dramatically reducing costs, and creating unique functionality, you have to go where the existing way of doing business will be challenged. It is unlikely that radical innovations will come from "zones of comfort".

**PG:** What are your thoughts on the dichotomy between innovation and efficiency?

**CKP:** Google allows extreme personalization. There is tremendous amount of variation in how Google gets used by millions people. A lot of chaotic activity in creating new applications. This aspect of Google gets talked about all the time. But consider its back end. Imagine if Google went down for 3 minutes. There is another side to Google-extreme efficiency. The server farms have to be managed with Six Sigma capability. My point is that even if you want extreme personalization, you must still have extreme efficiency in some parts of the business. It is the optimization of both parts, so the efficiency versus innovation dilemma is a spurious argument. It is as spurious as earlier arguments about quality versus cost or differentiation versus cost arguments. It is both, not either or.

**PG:** How do you understand the customer requirements for creating innovative solutions?

**CKP:** My article on the "Innovation Sandbox" explores this question. The basic idea is that innovation is not about eliminating all constraints, it's about understanding the critical constraints so that before you innovate, you know if you meet those constraints you will be successful. So the question is, How do you get deep understanding of those constraints through extreme levels of immersion with consumers?

It is important not only to understand what consumers currently want, but also what they will need in the future. Video ethnography enables you not just look at what people are saying they want, or what they say about product and services, but what they really do with their lives. You are able to understand their lives through content analysis.

Consumers even make the video or take pictures themselves, and they show you what really reflects their lives. This enables you to co-create with consumers, to understand the critical insights and then convert them into constraints. I call this the sandbox. Those constraints then become prerequisites which you cannot violate. Within these prerequisites you can make any number of innovations without violating the boundary conditions that you have created for yourself.

**PG:** A survey done some time ago by a consulting firm found that the more CEOs invest in innovation, the less return they make. A lot of companies are cutting funding on basic research, and instead focusing on products that generate revenue in the short term, but risking the long term viability of the business. How do you ensure that companies earn a return on innovation on basic research?

**CKP:** Working on basic science for the long term was the strength of R&D groups like Bell Labs. With a budget of \$3 to \$4 billion, they did not worry about how to improve AT&T in the short term, but they did solve interesting problems in physics and networks. I think increasingly people are asking if companies can afford that.

But what is more interesting today is figuring out how to take a public good, the scientific breakthroughs that come from anywhere, from universities, government laboratories, and large

companies like Bell Labs, and convert them into workable technologies that create unique advantage for human beings. It is the conversion of science to technology to unique products and services that monetizes it, and this remains a great challenge.

So when people ask if the returns on basic science research are becoming a drag on productivity, the answer is “No”. The problem that groups like Xerox PARC or Bell Labs faced was that they were so separated from business that this translation – science to business bridge building – was not taking place, and in some cases it was not expected. Today it is necessity.

So instead of going and *repairing the bridge* between pure science and technologies and business models, we just said pure science does not pay. But I think that it’s not sensible to say that. If we take that approach, then we are assuming somebody else will do pure science – universities, national laboratories – but the commercialization is what we are interested in.

Over the long term this will not work. Even if you want to only commercialize you must have your antenna clearly fixed and sensitive to what is happening in science, where the new things are emerging. If you are not investing well, and you remove all the basic scientists, then you have removed the antenna. You have chopped off your ability to “see and listen”. It is like chopping off the “sense-making” capability of the firm - the head.

**PG:** So what is the solution?

**CKP:** I think there is going to be rethinking. Microsoft, for example, is not cutting all of basic research, and Google is not cutting all of basic research. I think there is going to be a new group of companies that have a better understanding of how to make this click. They are going to emerge because I don’t think fundamental investment in science has failed us.

**PG:** Are we reaping the benefits of it?

**CKP:** Yes, absolutely! Basic science investments have all paid off in many commercial applications year after year.

**PG:** Many firms are struggling today. How can small businesses participate in this innovation age and succeed?

**CKP:** Small companies need to realize that they are part of an ecosystem. Either they are the part of a larger company ecosystem, or even part of the global ecosystem. Today smaller companies have greater ability to participate in technology related fields than ever before because the Internet provides them an extremely good source of opportunities to connect with other firms and customers

Let’s assume I am a small company, and I have a complex technical problem to solve, but I don’t have the people to solve the problem. I can put it on the Internet and somebody, somewhere in the world may solve the problem for me, and I will compensate him or her for it.

So actually today you have more degrees of freedom to create and participate in hi-tech solutions and problems than ever before. I think we have to learn to be savvier, and I think all this discussion about open innovation and connect and develop solutions are interesting ways of thinking about the same problem.

**PG:** Ford and GM are cutting jobs? What are going to be the new, future industries?

**CKP:** Science is going to be critical. I recently gave a speech on science and strategy in which I said that there are seven or eight areas of science, including brain studies, nanotechnology, mathematics, artificial intelligence, predictive modeling and things like that which will have extraordinary influence on environmental and sustainability issues. They are going to have enormous implications.

For example, food companies will have to understand both neuroscience and biology because they have to create wellness and vitality. Very soon you are going to get brain foods, energy enhancers, and things of that kind. Traditional industries will morph, and at the same time new industries will be formed.

Over the last 100 years there were three or four defining moments, such as Ford’s assembly line semiconductors, computers and space, increasing impact of information technology, and the convergence of communications, computing, consumer electronics, and software. Next we will see the

integration of biology and information industries.

For example, an interesting question is: how do you create energy efficiency and reduce carbon footprint? Someone recently noted that “we did not move out of the stone age because we ran out of stones.” Similarly we are going to go beyond the fossil fuel age because we innovate, because we are accustomed to innovation.

The lifestyle every American lives today is roughly the equivalent of having 100 servants. The goal is not to reduce the lifestyle, but to find a new way of creating it sustainably. We are going to create fundamentally different businesses and industries in those areas through integration.

For example, science is being fragmented into smaller and smaller pieces. 50 years ago there were probably 5 journals on biology, while today there are 500 or so. There are narrowly specialized fields, but every opportunity for innovation is at the intersection of fields.

To understand aging requires an understanding of biology and genetics. It requires social understanding on why people living in joint families are better off than people living in assisted homes. So it is perhaps ten different disciplines coming together that can help manage aging, and it is the same with climate change and other issues.

To strategize the process of recognizing solutions to these problems requires integration of multiple streams of expertise that no individual can command; you have to bring them together at the same place.

**PG:** What new areas are you investigating?

**CKP:** I am spending time looking at the connection between bottom of pyramid, globalization, connectivity, and sustainability. I believe they are going to be four dominant themes. 4 billion new people change the way we think about globalization. Connectivity will change the way these 4 billion people will participate in the economy. Sustainability because there so many new consumers, and even if they consume 1/10th of what Americans consume, that is another 400–500 million equivalent Americans, which is an unsustainably large number.



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