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# THE SOPHISTICATED INNOVATOR

## NATIONAL MED WEEK 2007 CONFERENCE

SEPTEMBER 13 - 14, 2007



*Anniversary*

# The Sophisticated Innovator

## *Practical Insights from Provocative Stories of Innovation in Minority Business Enterprises*

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In collaboration with the  
Minority Business Development Agency  
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# Table of Contents

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Foreword.....	4
Preface.....	5
Introduction: Why Innovate? How?.....	6
Level 1A: Innovation in its Most Elemental Form .....	10
Level 1B: Lengthier Innovation Initiatives.....	14
Level 2A: Multiple Simultaneous Innovation Initiatives.....	16
Level 2B: Routine Lengthy Innovation Endeavors .....	19
Level 3: Managing a Series of Heterogeneous Initiatives.....	21
Level 4A: Innovations Requiring New Organizational Forms.....	25
Level 4B: Building New Businesses, New to the World.....	29
Conclusion.....	31
Table 1: Innovation Principles, One Degree-of-Difficulty at a Time .....	32
Appendix: Ideas about Ideas.....	34
Acknowledgments .....	36
Notes on Sources and Further Reading.....	37
Author.....	39
Tuck School of Business at Dartmouth .....	39
Minority Business Development Agency.....	40
Tuck School and MBDA Partnership.....	40

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# Foreword

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The American Competitive Initiative (ACI), launched by President George W. Bush, recognizes the need for U.S. companies to remain competitive in the global market through innovation.

A highly-skilled workforce, greater investment in research and development, and an environment that spurs entrepreneurship and innovation are some of the keys to continued economic growth.

The 2006 ACI report underscores the President's message: "Our prosperity is no accident. It is the product of risk takers, innovators and visionaries. We owe our global leadership in large measure to our willingness to build an economy and culture that welcomes and encourages innovations and flexible, open markets."

Through this paper, written by innovation expert Professor Chris Trimble of the Tuck School of Business with the collaboration of the Minority Business Development Agency, we hope to challenge minority business enterprises to pursue a strategy of innovation for continued growth and competitiveness.

As we release this paper during the 25th Anniversary of the Minority Enterprise Development Week Conference in September of 2007, we also wish to celebrate the achievements of minority entrepreneurs whose persistence in bringing innovative ideas to the marketplace have contributed to America's global leadership in innovation.

Ronald N. Langston  
National Director  
Minority Business Development Agency

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# Preface

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There are dozens of ways to increase profits. You can cut costs, you can negotiate more aggressively, you can raise price. Perhaps, however, you want profits plus something more profound.

Try innovation.

Some companies excel at today's business. Those companies keep the wheels of the economy turning. Other companies innovate. These are the companies that build a better economy for tomorrow and raise living standards for all.

The largest companies have mammoth resources at their disposal for innovation. And so it is, and so it should be, that the most storied innovators are always the underdogs — those working in the garage.

Your garage may be lonely, but you do not work alone. America stands behind its minority business enterprises and salutes its innovators. In particular, America honors its enterprising leaders of this generation and of generations past for their historic and continuing contribution to the America we take pride in today. To sustain its greatness, America must continue to foster innovation domestically, attract the most talented and energetic business leaders from around the world and put their skills to work in this nation.

America is a diverse nation today and will be a more diverse nation tomorrow. Nearly 20 percent of U.S. enterprises are minority-owned, and that percentage is rising. America's minority population has passed the one hundred million mark, and that population is growing. The importance of a vibrant minority enterprise is high, and it will only get higher. Increasingly, the face of minority enterprise is the face of the American business.

If innovation drives the American economy, then you, as a leader of a minority business enterprise, must be an agent of innovation. I hope that this paper and the Minority Enterprise Development Week conference provide at least a small push towards taking your innovation initiatives to the next level.

Honest innovation researchers will acknowledge that you can learn as much from other innovators as you can from research. My approach is to try to give you the best of both. I invite you to walk in the shoes of many of your brethren in the world of minority enterprise. Their narratives are presented here. To the best of my ability, I'll sprinkle a dose of innovation insight amidst their provocative innovation stories.

You will enjoy the stories. These innovation journeys can be your own, if you choose it.

Chris Trimble  
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## Introduction: Why Innovate? How?

### *Innovation is at the Foundation of Business Success and Sustainability*

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All companies, whether small or large, whether new or established, must innovate. In fact, all companies eventually reach a crisis where the options are stark and simple. You can innovate, or you can die.

Many companies, even the largest, stumble when they reach that crossroads. In fact, the average life expectancy of a Fortune 500 company is less than that of a human being. As Ray Stata, Chairman of semiconductor giant Analog Devices Incorporated (ADI) once said: "Every business has a life, and you always need to be looking beyond that life. The job of the CEO is to sense [the end of life] and respond, and to be an encouraging sponsor for those who see the future." In other words, the only way to turn a thriving enterprise into an enduring institution is to strike a healthy balance between innovation and business-as-usual.

A high-stakes innovation challenge could arrive at any moment. For one just-launched, minority-owned company, Combustion Associates, Incorporated (CAI), that challenge came excruciatingly fast. (See sidebar, "Confronting the Innovation Challenge.") Your own crossroads could be months away or it could be decades away.<sup>1</sup> To wait for it to arrive is to wait too long. The day to start building your company's *innovation muscles* is today.

*"Every business has a life, and you always need to be looking beyond that life."  
Ray Stata, Chairman of Analog Devices Incorporated*

There are rich rewards for starting now even if your life-and-death challenge is distant. Innovation sustains growth. No matter how successful at launch, growth rates for all new products and services eventually decline. Only repeated innovation sustains long-term growth. Furthermore, innovation sustains profitability. We all compete in a global economy that is more transparent than ever before. As a result, no cost advantage lasts for long. Companies sustain competitiveness only through routine innovations to improve efficiency.

The reasons to start innovating today go beyond direct financial rewards. Innovation satisfies employees. It gives them a reason to come to work each day. Though there is some comfort in routine, some comfort in equilibrium, it is inevitably a short-lived comfort. Enduring stability deadens spirits. People come to work wanting more, wanting to improve the world in front of them. Humans build. Humans innovate.

But how? Let's start with the obvious. You need some innovative ideas.

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<sup>1</sup> For insight to the lifecycles of minority-firms, see *The Life Cycle of a Minority-Owned Business: Implications for the American Economy* by Andrew B. Bernard and Matthew J. Slaughter, 2004. Prepared for the 2004 National Minority Enterprise Development (MED) Week Conference.

In fact, when most people hear the word “innovation,” their immediate association is with the innovative idea itself – the romance of the “light-bulb moment.” When most business leaders think of steps they could take to make their companies more innovative, they think first about unleashing employee creativity to generate more ideas.

However, most companies, large and small, do not struggle from lack of ideas. Most have plenty of ideas. The struggle, instead, is to move more of the promising ideas forward.

*Here is a fundamental innovation axiom: In any great innovation story, the idea is only Chapter 1.* Ideas are crucial – but ideas are only beginnings. In the Appendix, you will find some ideas about generating ideas, and information about the role that federal government programs can play in that endeavor.

This paper focuses on what comes *after* the idea. The journey from ideas to business results is difficult, because innovation is inevitably in conflict with business as usual. Tomorrow is inevitably in conflict with today. One of the central challenges of managing innovation, beyond ideas, is productively resolving that conflict.

What comes after the idea? Sadly, there is no science of innovation – no by-the-book discipline that will get you from idea to results. While many innovations are rooted in scientific discovery, *managing* innovation is far from scientific. The community of innovation researchers is only beginning to uncover with any clarity the best practices for making innovation happen. We do know that innovators are often inspired, determined, and committed. But we also know that inspiration and perspiration are not always enough.

*In any great innovation story, the idea is only Chapter 1.*

Raising innovation capabilities to the next level starts with recognizing that innovation, at its very core, is about *learning* from *experiments*. Furthermore, *some experiments are much more difficult than others*. Experienced innovators, particularly those that participated in diving or gymnastics in their youth, recognize that some innovations are like a somersault, and some are like a triple-flip-with-a-quadruple-twist. These two insights lie at the foundation of this paper.

This paper tackles the low-degree-of-difficulty innovations first, and works its way up to more difficult forms of innovation, one step at a time. Along the way, it illustrates several forms of innovation with examples from minority business enterprises.

The criteria used to differentiate innovations of various degrees of difficulty may surprise you. This paper minimizes reliance on the most common innovation categorizations – process innovation, product innovation, service innovation, adjacent market innovation, new ventures, incremental innovation, radical innovation, disruptive innovation, and sustaining innovation. These terms can be vague. One person’s incremental improvement is another person’s radical change. One person’s process improvement is another person’s new service offering. Despite the ambiguity, many managers find these categories useful in conversations about business *strategy* or in efforts to *prioritize*

innovation proposals. However, these categories are not useful when describing best practices for *implementing* innovations.

In assessing degree-of-difficulty, the questions asked in this paper focus on the operational realities of the innovation experiments. For example:

- How long does the experiment take? Hours? Weeks? Months? Years?
- Is there one experiment? Many simultaneous experiments? A sequence of similar experiments? A sequence of unique experiments?
- How costly is the experiment relative to resources available?
- To what extent does the experiment require building new organizational sub-units? With new skill sets? New work processes? New reporting structures? New job descriptions?
- To what extent will the “innovation group” need to interact with the business-as-usual group to implement the experiment?

These are the questions that establish an innovation’s degree-of-difficulty.

There are other dimensions of the innovation challenge beyond the managerial – such as technical or engineering challenges. A staggering complex technical breakthrough can be relatively straightforward for managers to implement. And, a relatively unimaginative idea with no technical complexity whatsoever can be extraordinarily difficult for managers to implement.

Some innovations are more difficult to manage than others. The most prepared companies stand ready to tackle a wide range of innovation challenges.

Onward.

## **Confronting the Innovation Challenge**

Just a couple of years after they launched their new business, Mukund Kavia and Kusum Kavia could see the end coming.

Combustion Associates, Incorporated (CAI), a minority business enterprise, had opened its doors as an engineering consulting firm in Southern California in 1989. Their timing could not have been better. California Air Quality Management Districts had just passed more demanding air quality regulations. Commercial boilers of a certain size – those used to provide heat and hot water in schools, hospitals, and hotels, for example – needed to be upgraded to meet the new standards. The managers of such operations did not typically employ experts on boiler emissions. They needed help. They needed someone like Mr. Kavia.

As a result of its fortuitous timing, CAI got off to a fast start. Mr. Kavia was a Kenyan of Indian descent, and he had been educated in the United States and the United Kingdom in the field of mechanical engineering. In starting CAI, he had found a satisfying way to put his skills to work and to earn a living as an entrepreneur.

There was just one problem. What would CAI do once all of the boilers affected by the new regulations had been upgraded to meet the new standards? That day was coming, and it was coming fast.

For CAI to survive, Mr. Kavia needed to reinvent it. He needed to find an innovative way to put his skills and his colleagues' skills to work. In the course of CAI's consulting work, the company expanded its expertise in the design, manufacture, installation, and operation of boiler systems, and deepened relationships with several manufacturers. Searching for a way to build on these new assets, CAI started to take on expanded contracts. Rather than just giving advice, CAI began operating as a general contractor providing installation, training, and after-service support.

Then, the company went a step further. Some of the manufacturers that CAI was working with had more orders than they could handle. CAI developed partnerships with the manufacturers, handling some of their manufacturing in their own facility. The manufacturers respected CAI and recognized that the company's close contact with customers gave them insight that they otherwise would not have. CAI steadily expanded the kinds of products that it manufactured and tripled its revenues over the next five years. Through innovation, through bringing new skills to market, CAI created a new future for itself, and became a rejuvenated force in the California economy.

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## Level 1A: Innovation in its Most Elemental Form

### *The Story of Ryla Teleservices*

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**What's Level 1?** At Level 1, there is a *single* innovative idea. It improves or expands the existing business and measuring its success is no different from measuring the performance of the existing business. Also, there is no need to hire new kinds of experts or to substantially change job descriptions or core business process. At Level 1A, innovations can be implemented in a *short time period* – at most, a few months.

**Innovation Principles:** The most fundamental innovation discipline is one of learning quickly from experiments. That is easiest when feedback is rapid and the innovation makes only limited departures from the existing business. The most prepared innovators identify the specific performance measures that are likely to be affected by the innovation, understand how those changes will impact profitability, and are ready to react quickly should the experiment produce disappointing results.

Mr. Mark Wilson sipped his tea and listened intently to the President of the Republic of Kenya, Emilio Mwai Kibaki. He had just finished addressing an audience of Kenyan government officials and business leaders, and President Kibaki had asked for further dialog. Mr. Wilson had departed his native state of Georgia for the business trip to Kenya with modest expectations. The trip had exceeded those expectations – dramatically.

Five years earlier, in 2001, Mr. Wilson and his wife Shelly had launched Ryla Teleservices. Ryla was a call center operation just outside of Atlanta. The couple named the company after their children, Ryan and Lauren. They were excited, but uncertain where their entrepreneurial adventure might take them.

The Wilsons aspired to create a better kind of call center. Mr. Wilson, an African-American, had years of experience managing call centers for a corporation, and was thoroughly familiar with the central difficulties faced by call centers, particularly the challenge of keeping employees engaged, or even just keeping them employed. According to Mr. Wilson, the typical call center needed to replace more than 75 percent of its workforce each year. The vision for Ryla was to mix the best advantages of a small company – a close-knit, loyal, high-aspiration workforce that delivered high quality on every call – with the sophisticated technology infrastructure usually only found in much larger operations.

Ryla Teleservices grew quickly to several hundred employees without even hiring a sales force. Their quality was high, and their customers did the selling for them through word-of-mouth. Employees were as satisfied as customers. In fact, employee turnover was only roughly 30 percent.

Ryla's customers pushed Mr. Wilson to do even more. As Ryla was growing domestically, the call center industry was growing overseas, particularly in India and the Philippines. Mr. Wilson had not launched Ryla with an ambition to expand abroad, but customers were leading him that way. Ryla could have declined, but that would have only limited Ryla's growth domestically as well as globally. Ryla's customers would simply have found another supplier, potentially a firm not only operating overseas, but owned and managed overseas.<sup>2</sup>

A contact of Mr. Wilson's at the Ford Foundation, which had considered Ryla for an award, urged Mr. Wilson to consider Kenya and offered to arrange some initial meetings. Why Kenya? India was far more talked about, but as India's outsourcing industry grew, India's attractiveness for setting up new call center operations declined. It became more difficult to hire quality employees and salaries rose. Kenya, on the other hand, was as yet undiscovered, despite the fact that it had many of the same advantages as India – in particular, a well-educated, technology-savvy, English-speaking population.

Mr. Wilson decided to take up the offer for a few introductions in Kenya. Soon after his visit, he initiated a grand experiment: to discover whether Ryla could duplicate its success on foreign soil, eight time zones from home.

The use of the word *experiment* is deliberate. The discipline of innovation is first and foremost a discipline of experimentation. Innovation projects have uncertain outcomes.

Many managers, by training, abhor uncertainty. They endeavor to eliminate as much of it as possible. The more accurate the forecasts, the better the decision-making, the thinking goes. Mr. Wilson's reflections on the launch in Kenya are reflective of such a mindset. "If we had been more diligent about understanding all aspects of what we were doing, we might have anticipated more of the challenges we faced, and been more proactive," he said.

While innovators should, of course, resolve as many uncertainties as possible *before* taking the plunge, uncertainties inevitably remain. Even the most exhaustive a-priori research could never have given Mr. Wilson an understanding of call center operations in Kenya that was nearly as accurate as his understanding of call center operations in the United States. Call centers were relatively new in Kenya. Mr. Wilson was making a pioneering effort.

What do sophisticated innovators do in the face of uncertainty? They identify the uncertainties as clearly and specifically as possible, and they set out to resolve those uncertainties by running experiments, measuring outcomes, and analyzing.

Even though Ryla did not have, and could not have had, complete information about call center operations in Kenya, the nature of the uncertainties in the innovation experiment was clear to Mr. Wilson, who was deeply familiar with call center operations. He had studied Ryla's income statement for years. At least in the United States, he knew what every aspect of call center operations cost, and what price would

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<sup>2</sup> While some customers pushed Ryla to open overseas operations, others preferred domestic call centers, despite the higher expense. Ryla's maintains growing operations both in the United States and Kenya.

generate a healthy profit. The question was, which income statement parameters would vary? By how much? What would the aggregate picture look like?

*What do sophisticated innovators do in the face of uncertainty? They identify the uncertainties as clearly and specifically as possible, and they set out to resolve those uncertainties by running experiments, measuring outcomes, and analyzing.*

Some of Ryla's costs would not change in Kenya. The company planned to use the exact same computer infrastructure in Kenya as they used in the United States, for example. Other parameters, such as salaries, could be researched in advance. Salaries in Kenya for call center employees were about one-third of salaries in the United States.

But there remained several uncertainties, including price. Ryla's clients had pushed for overseas operations so that they could demand price cuts. But what level of quality could Ryla achieve in Kenya, and what did that imply for the price customers would be willing to pay? Another uncertainty was the cost of hiring and training. These costs would multiply if Ryla experienced high turnover, which was also hard to estimate in advance. Ryla had proven effective in motivating and retaining employees at home but had no way of knowing how effective their approach would be in a different country. A final uncertainty was the cost of telecommunications. As of launch, costs were extremely high, much higher than in the United States, but Kenya was investing in improvements, and the government was willing to offer telecommunications subsidies to stimulate the growth of the call center industry.

It took just a few months to resolve the uncertainties. Kenya did indeed have large numbers of educated but unemployed people, and hiring and training was as straightforward as Mr. Wilson anticipated. However, retaining employees was much harder than expected. Problems surfaced quickly. Some Ryla employees in Kenya simply could not adapt to the awkwardness of working at night. (Working at night was necessitated by the time difference between the United States and Kenya.) Others quit because of the difficulty of travel within Nairobi. Commuting to work was more burdensome than employees anticipated. Finally, Ryla hired the best and brightest that they could find. Many were working towards better degrees and better jobs. They simply did not stay in one place for long.

Costs of telecommunications, data links in particular, also turned out to be substantially more expensive than anticipated. Mr. Wilson was able to offset the cost a bit by arranging assistance from both from the Kenyan government and the World Bank.

There was no way to know it in advance, but operations in Kenya turned out to be profitable. Positive and negative variations from the familiar balanced, and the income statement for the Kenyan operation did not look much different from the income statement for the United States. All of the Kenyan numbers, per employee, were of course lower, but according to Mr. Wilson, as a percentage of revenue, technology costs and human resources costs, the two major cost components, were essentially equal in each country.

Ryla had established a toehold in Kenya. They had constructed a new overseas operation that Ryla's clients were eager for. Ryla had begun to establish a positive reputation in the Kenyan employment market, one step ahead of the competition that would certainly follow if Kenya's trajectory of economic development continued. Should Ryla choose to continue along an aggressive international growth path, Mr. Wilson also has the beginnings of a model for a repeatable process for entering new countries.<sup>3</sup>

Ryla's experiment carries a low degree of difficulty. This is not a value judgment. In fact, from all appearances, this innovative endeavor will position Ryla for continued rapid growth domestically as well as abroad. If you can achieve such high impact without tackling something extraordinarily complex, you should.

There are two characteristics of Ryla's innovation that are relevant in assessing the degree of difficulty. First, Ryla did not alter its model for operating cost centers. It was not developing a new theory for effective call center operation. It was, in fact, trying to duplicate, not reinvent, the way it did business – albeit in an unfamiliar environment with unpredictable cost factors. Because Mr. Wilson was so thoroughly familiar with the drivers of profitability for call center operations, he knew exactly what the uncertainties were. They could be reduced to specific parameters like hiring costs, technology costs, and price. Second, improved estimates for these parameters could be developed through experimentation *quickly*. It takes a matter of months, not years, to get a new call center off the ground.

Why do these characteristics matter? Recall that the core discipline of innovation is a discipline of experimentation. To be only slightly more specific, it is a discipline of *learning quickly* from experiments. Some learning environments are more challenging than others. Under ideal conditions – when experiments depart from the familiar only in a small number of readily identifiable ways and performance feedback is rapid – learning is practically second-nature.

In such innovation endeavors, the most dangerous pitfall is overconfidence. When innovation leaders presume success, they have no motivation to identify uncertainties, and they overlook relevant new information, even critical information that might otherwise lead to quick discontinuation of a project that is on a path to failure.

Innovation is uncertain, and thus innovation invites failure. The best failures are those that innovation leaders recognize swiftly, learn from, and move on from before sinking even one dollar more in the innovation project than is strictly necessary. Thus, a core innovation virtue is *humility*.

*Innovation is uncertain, and thus innovation invites failure. The best failures are those that innovation leaders recognize swiftly, learn from, and move on from before sinking even one dollar more in the innovation project than is strictly necessary.*

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<sup>3</sup> See Minority Business Enterprises in the Global Economy: The Business Case by John Owens and Robert Pazornik, 2003, Prepared for the 2003 National Minority Enterprise Development Week Conference.

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## Level 1B: Lengthier Innovation Initiatives

### *Learning from Sophisticated Product Development Systems*

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**What's Different?** The *only* difference is that at Level 1B, the innovations take longer – a few quarters or even a few years.

**Innovation Principle:** *When innovations take quarters or even years to implement, innovators must routinely assess not whether an innovation is a success today, but whether or not it is on a trajectory to success. Thus, all innovation measures should be evaluated not based on today's result but based on the longer-term trend in results.*

Rapid feedback makes learning much easier. Think about the difference between learning to pitch in baseball and learning to launch a new product. In baseball, the umpire calls “ball” or “strike” a split second after the pitch. Now, that’s rapid feedback! Such feedback is very useful to an innovator. Immediately you can draw conclusions about whether what you tried had a positive or negative impact.

Learning to launch a product takes much longer. Each time you try it, you must wait months, quarters, or even years before you can be certain whether the investment you made in developing the product has earned a healthy return. That does not mean, however, that you cannot begin drawing inferences about whether the product is on a path to success or failure much sooner.

Large consumer products companies, from Procter & Gamble to General Motors, illustrate this concept well. For these companies a steady stream of new product launches is crucial to sustaining strong results. Rivals try to outdo each other with new products or improved versions of existing products several times per year. Think of Coca-Cola launching Dasani bottled water, or Panasonic launching their latest high-definition plasma television set.

Such exercises are similar to the Ryla launch in Kenya in that the companies are not reinventing their businesses when they launch a new product. The machinery of business does not change, only the product that is pushed through the machinery of business changes. Not all products launched perform highly by every measure of interest, but the measures of interest remain the same.

The crucial difference between Ryla’s launch in Kenya and a major new consumer product launch is that the latter plays out over a substantially longer time period.

In these types of innovation endeavors, sophisticated innovators pay a great deal of attention to *trends* when evaluating progress. How quickly are sales accelerating? How much has consumer awareness of our product improved? How rapidly are we expanding distribution? How quickly are our unit costs coming down?

Trends are of course relevant for managers of mature products as well. Changes of a few percent per year are big changes for a mature business. As a result, managers of mature businesses frame conversations about performance as conversations about departures from normal operations or departures from plan. A fundamental assumption in financial accounting, the presumption that a business is an *ongoing concern*, encourages that view. Businesses are viewed as stable and continuous.

New product launches, to the contrary, are quite dynamic. There are dramatic changes in business results quarter-to-quarter, even month-to-month. The difference is analogous to the difference between flying a commercial jet at 35,000 feet on autopilot and handling a take-off or landing. At altitude, the pilot looks at a dull, stationary dashboard. None of the needles are moving around the dials. During takeoff and landing, however, all of the needles are in motion. Pilots absorb not just each reading but how quickly each is changing. Similarly, in dynamic business situations such as new product launches, trends are at least as important as current performance data.

A manager of a new product must assess not whether the product is profitable now but whether the product is on a *trajectory* to profitability. This is tough to judge based on current-period performance alone. When innovation projects last for a few quarters or a few years, the most sophisticated managers plot nearly every business performance measure on a graph over time so that trends are clear. Doing so best helps shape judgment about whether the new product or service is on its way to success or failure.

A foundational managerial habit for innovators is reorienting discussions of business performance to discussions of trends in all operational measures. Two additional practices multiply the effectiveness of the habit.

*When innovation projects stretch out over several quarters or a few years, the most sophisticated managers plot nearly every business performance measure on a graph over time so that trends are clear. Doing so best helps shape judgment about whether the new product or service is on its way to success or failure.*

The first is to seek leading *indicators* of key performance measures. For example, in new product launches, the greatest uncertainty, by far, is sales. Will consumers like the product? Rather than monitoring only the trend in sales itself, sophisticated innovators seek as many leading indicators of sales as they can find. Are consumers aware of the product? Do they know where to find it? Are early users satisfied? Are they talking to friends about the product? Analyzing trends in leading indicators further helps shape judgment about the trajectory that sales will follow.

The second habit is increasing the frequency of business performance reviews. The discipline of innovation is a discipline of learning quickly from experiments. Increasing the frequency of business reviews, from quarterly to monthly, for example, leads to earlier trend identification and accelerates learning.

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## Level 2A: Multiple Simultaneous Innovation Initiatives

### *The vCustomer Story*

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**What's Different?** At Level 2, instead of a *single* innovative idea, there is a *system* for generating a *steady stream* of *similar* innovations, perhaps dozens or hundreds. These innovations may even be in progress simultaneously. At Level 2A, the length of experiments is once again short, a few months at most.

**Innovation Principles:** *At Level 2, the role for senior managers changes dramatically. Their job is no longer to directly manage an innovation experiment. Instead, their most important responsibilities are (a) to define a clear innovation charter achievable given the skills, time, and resources available to innovation leaders, and (b) to establish as effective a learning environment as possible, one which enables each innovation leader to learn quickly from experience.*

Ryla's launch in Kenya was a big move closely managed and supervised by the company's CEO, Mr. Wilson. But what if the innovation journey looks less like one giant step, and more like hundreds of small steps? What then? Clearly, the CEO cannot be involved in implementing and learning from each experiment. In such circumstances, the CEO's role changes dramatically.

Sanjay Kumar, an Asian Indian, launched his sophisticated call center operation, vCustomer, in 1999 in Kirkland, Washington. vCustomer was an early entrant into the now rapidly expanding market and grew quickly propelled by high quality and a low cost.

Mr. Kumar had higher aspirations. And he had a revolutionary idea. Quite counter to intuition – call centers are most often paid either by the call or by the hour – Mr. Kumar wanted to find ways to help clients *shorten* or even *eliminate* calls coming into their call center. Explained Mr. Kumar: "Today, clients view customer service only as a cost. If I took the same view, I certainly would not want to reduce the number of customer service calls coming to me – doing so would only reduce my revenues. But that is a very short term viewpoint. If I can find ways to add new value, beyond simply providing an effective labor pool, clients will reward me in the long run."

By 2007, vCustomer was handling over 100,000 phone calls *per day*, almost exclusively for U.S.-based corporations. To maximize competitiveness in their own industries, these customers demanded low costs, and vCustomer saw an opportunity to locate its call centers in India. vCustomer invested heavily in information technology. The company recorded information from each call, built a huge database, mined the data with sophisticated search engines, and gleaned valuable insights for customers.

For example, if vCustomer served a manufacturer of high-definition television sets, it could discover, through analysis, that most of the manufacturer's customer service calls were tied to a misprint in the user's manual. Or, if vCustomer served an Internet retailer, it could recognize a high volume of calls related to confusion over how to return a defective product, and then it could suggest ways the retailer could improve its online explanations of policies and procedures for product returns. Or, if a client was running several promotions, vCustomer could help diagnose which was most effective.

Of course, Mr. Kumar himself could not be pouring through the vast data that vCustomer collected to find every insight himself. Instead, he had to somehow empower and enable his entire workforce, nearly 4,000 strong, to develop their own routines for finding valuable insights for clients and passing them along. But how? How could he establish an environment in which employees could effectively identify promising experiments, partner with clients to make them happen, and learn from them?

Mr. Kumar's formula begins with empowerment. In most call centers, front line supervisors expect operators to adhere strictly to scripts. At vCustomer, however, employees are expected to think on their feet and partner with callers to solve problems. That is demanding enough, but Mr. Kumar pushes even harder. In addition to solving problems from the caller's point-of-view, Mr. Kumar asks that employees endeavor to understand the *root cause* of the problem. A defective part? Confusing instructions? Consumers using a product in a way it wasn't intended to be used?

Only exceptional call center employees can handle these demands. Mr. Kumar goes out of his way to recruit the best, specifically evaluating problem-solving skills in the interview process. vCustomer also invests heavily in training and development. New employees practice problem-solving skills using tapes of actual calls before handling live calls under the direct supervision of a mentor. vCustomer then expects each employee to schedule at least 2.5 hours of self-directed computer-based training each week.

vCustomer's talented call center operators generate many hypotheses about how vCustomer's clients might improve business performance. Cross-functional teams that include the call center operators, client relationship managers, and technology experts select among the most promising of those hypotheses, analyze them based on extensive in-house data, and then encourage clients to run mini-experiments to test them. vCustomer then monitors the impact based on data from subsequent calls and based on changes in client satisfaction. Clients were pleased. In fact, vCustomer was the third-fastest growing privately held company in 2004, according to an analysis by Inc. magazine.

The discipline of innovation is a discipline of learning quickly from experiments, and learning is easiest in rich feedback environments. vCustomer invests heavily to ensure that every team and every employee can quickly see the results of their initiatives. The company distributes client satisfaction scores *weekly*. In fact, the company makes this information data visible on a performance "dashboard" on every employee's personal computer. Client satisfaction scores are calculated by client, team, and individual customer service agent, showing trends over the past several weeks. Scores are broken down to such specific performance dimensions, in fact, that each employee can

customize their self-directed training to areas where their individual performance most needs improvement.

Such rapid feedback is motivating. It gives employees a sense that they can take initiatives that have immediate impact. vCustomer further motivates employees by tying portions of their compensation directly to feedback from clients.

*The discipline of innovation is a discipline of learning quickly from experiments, and that is accomplished most easily in rich feedback environments.*

There are some elements of vCustomer's approach to innovation that sound like managerial motherhood and apple pie. Hire talented people! Invest in their development! Motivate them! Empower them! These dicta are so universally applicable in business that they hardly seem worth repeating. At vCusotmer, they are necessary elements of the innovation engine, but they are insufficient.

There are two additional insights from vCustomer's approach to innovation that are more important and less mundane. First, if you want your employees to innovate, you have to give them a *clear and focused innovation charter that is within their range of capabilities and achievable within their limited free time*. Mr. Kumar's innovation charge to employees was clear, specific, and achievable. *Try to identify root-causes of the problems that callers are describing and turn those insights into usable advice for our clients*. Many companies claim that any employee can and should innovate – but leave it to employees to figure out exactly what that means on their own initiative. That is a formula for disappointment, disengagement, and disaffection. Employees will think big, well beyond what is feasible within the constraints of their existing jobs, and will find only frustration.

Second, if you want your employees to innovate, *create an environment in which employees can learn quickly from their own experiments*. That means providing employees with the clearest and quickest possible performance feedback.

In complex business environments, employees may also need help interpreting the results of their experiments. Toyota, recognized for its success in motivating manufacturing employees to improve business performance, trains extensively on the proper application of the scientific method and rigorously scripts routine work processes so that results from experiments can be carefully compared to baseline performance. Similarly, Deere & Company asks small teams of employees to find ways to improve manufacturing processes in their immediate vicinity but then supports those teams with experts skilled in statistical process analysis.

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## Level 2B: Routine Lengthy Innovation Endeavors

### *Learning More from Sophisticated Product Development Systems*

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Customer's approach to innovation generates many small-scale innovation efforts, those that can be handled by individuals or small groups of employees while meeting the demands of daily operations. It is an example not of just a *singular* innovation effort but a *system* for generating a steady stream of innovations.

Consider once again consumer products companies, faced with the constant necessity of introducing new products. The question faced by senior executives in these companies is not just how do I manage a single successful product launch but how do I build the organizational machinery necessary to produce a steady stream of new product launches? This is a question that most small business owners will not need to confront for some time, but it is worthy of our time now.

The techniques discussed earlier for single product launches remain relevant. Innovators must be skilled not just in analyzing current performance but in assessing the trajectory of performance by monitoring and analyzing trends, identifying leading indicators, and reviewing performance more frequently than usual. To achieve a steady stream of new products, these techniques must be systematic. They should be built into the templates used to create management reports. This must be done without damaging the business-as-usual machinery. The best route is often to separate planning meetings for new products from those for mature products. Performance discussions for new products are framed differently and should happen more frequently.

**What's Different:** The *only* change from Level 2A to Level 2B (just as from Level 1A to 1B) is that the innovations take longer – quarters or even years.

**Innovation Principles:** Executives should make the innovation process routine and efficient as possible by breaking down the process into specific tasks, specializing, and assigning specific roles and responsibilities. Measures that resolve the critical unknowns identical from one innovation to the next, can be built into routine management templates. Caution: Managers can *not* approach higher level innovations in this way.

As new product development operations grow, the roles of individuals within the product development teams become ever more scripted and ever more specialized. There are managers that specialize in various phases of the development process, and engineers that focus on one component of a typical product design. Specialization and process rigor is the path to efficiency in product development just as it is the path to efficiency in core business processes for mature products.

There are several thorny balances to strike in designing new product development and commercialization organizations.

- *Some companies design flexibility into the process to account for inevitable surprises, but flexibility can be expensive.* In automotive companies, for example, product development programs, about four years in length, are so regimented that managers know that interrupting or delaying the process once it has begun takes a level of authority just shy of an act of Congress.
- *Another tricky balance is managing risk.* The opportunities to score big with customers with cutting-edge features must be weighed against the damage a failed feature could bring to a strong brand. Deere & Company has specific checks and balances built into their processes to ensure that they take only prudent risks.
- *Handoffs between product development organizations and teams that manage the existing product lines are delicate.* Months of overlap and overstaffing may be safest, but it is also expensive.
- *Managers with years of experience developing and launching new products are extraordinarily valuable.* However, career rotations in and out of product development may develop more well-rounded senior leaders in the long run.

As effective and efficient as practiced, specialized new product development organizations can be, they can also become their own worst enemies. Specialization breeds efficiency but also inflexibility. For example, teams of engineers that have learned to work together to design cars may have to be completely broken down and rebuilt before they can tackle a completely new design. Some automotive companies are facing this challenge now as they confront radically new energy efficient designs.

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## Level 3: Managing a Series of Heterogeneous Initiatives

### *The Story of Interchez Logistics Systems, Inc.*

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**What's Different:** Level 3 is different from Level 2 *only* in that successive innovations are distinct.

**Innovation Principles:** Each innovation must be treated as a unique problem, and the innovation process cannot become routine and repeatable. The most prepared innovators develop a clear and distinct theory of how each innovation will succeed, and test the critical unknowns in each theory as quickly as possible.

Large consumer products companies can develop specialized processes for product development because there are vast similarities from one product launch to the next, similarities both in the design of the products and in the way they are commercialized. However, how can a company manage a sequence of innovation efforts when each is unique?

Mark Chesnes had worked for years in the transportation and logistics industry. His wife, Sharlene was chair of a collegiate foreign languages department and of Puerto Rican descent. They had always wanted to start their own business together, and in 2002, they did. Their story is one of growth propelled by three distinct innovations.

What do you get when you cross a transportation expert with a languages expert? A new minority business enterprise that can provide solutions to problems faced by gaggles of mid-size companies as they grow and expand across borders. In addition to making the most of logistics expertise, Interchez found a way to turn foreign language skills into a business advantage. Many minority business enterprises could consider similar opportunities.

The economy is much more globally interconnected than it was twenty years ago. As small companies grow, they are making decisions earlier than ever to globalize their operations. Imagine you own a \$50 million manufacturing operation and you have decided to build your next manufacturing facility in Central America. Initially, you may focus on building the facility and hiring employees. But you will also need to solve logistics problems that are more complex than they are at home. You have to ensure suppliers can get raw materials to you, and that you can move manufactured goods to the market. And, you have to overcome language barriers along the way, translating documents and communicating effectively with customs agents and other government officials. Interchez supports companies in overcoming these issues.

The Chesnes' business could easily have evolved into two distinct operations – one for transportation services and one for translation services. Some clients, in fact, use just one of the two services. One of Ms. Chesnes's clients, for example, is a law firm with international operations. The firm has no transportation needs, just translation needs.

Nonetheless, the Chesneses had a hunch that there was power in co-marketing their services. It was a hunch they began testing at conventions. This first innovation proved powerful.

By 2007, Interchez employed twenty-four people, most of whom worked in two transportation logistics centers: one in Ohio and one in Michigan. In addition, the company had contracts with numerous translators who could handle clients' translation and interpretation needs, 24/7, on demand.

Interchez signs long-term logistics contracts with their clients and manages their transportation needs from end-to-end. They negotiate partnerships with transportation providers around the world, and measure and monitor their performance on behalf of their client. At the heart of the transportation operation is Interchez's Transportation Management System (TMS), an Internet-based application that tracks all client's shipments minute-to-minute.

The Chesnes' second innovative insight was that the data on their TMS had value to clients. Perhaps you have tried tracking a specific shipment on the website of a major carrier like UPS or FedEx. Gathering information, one package at a time, would be extraordinarily cumbersome for a supply chain manager working for one of Interchez's clients. But on the Interchez TMS, customers can get information about all of their in-progress shipments on a single page, even if there are numerous transportation providers involved. Users can customize the page to highlight the performance metrics that are most meaningful to them. They can even set goals and monitor performance against those goals.

Not all transportation needs can be planned in advance. A damaged shipment, for example, might lead to an urgent need to send a replacement, which could be very expensive.

That is the problem that inspired the third innovation. For unexpected and urgent shipments, Interchez added a new service to its website, dubbed "Premium Freight Optimization." The service enables Interchez's clients to run a "reverse auction" to locate the least expensive carriers for their urgent shipment. Competing transportation services providers submit bids, and the customer may select the lowest. The entire process can be completed in about twenty minutes.

By 2007, Interchez had grown to roughly \$20 million in revenues per year, all fueled by reinvestment of earnings. The company continues to make aggressive new investments in its technology infrastructure, including a major reinvestment in the TMS.

To review, Interchez's three innovations were: co-marketing transportation and translation services, providing customers with detailed supply-chain visibility, and enabling reverse-auctions for urgent shipments. Consider for a moment what these innovations have in common. Right! Almost nothing!

Each of the three innovations was a significant investment. Interchez made the investments with little, if any, precedent. Unlike businesses that expand geographically like Ryla, there is no similarity in financial drivers between existing and new. Unlike the

experience of product development groups in consumer products companies, these innovations were not similar to past experiments. They offered new kinds of value to customers. They had distinct cost-benefit characteristics. They were unique efforts with uncertain impact.

All innovation involves at least some departure from the familiar. The greater the departure from a well-understood precedent, the higher is the degree of difficulty. The greater the departure from familiarity, the greater the learning challenge. In cases like Interchez's three experiments, there was no baseline comparison point. There were no financial statements from a similar operations in a different geography. There was no database of experiences managing similar innovations in the past.

Without such precedents, there is no obvious framework for evaluating whether the innovations are succeeding or failing. The evaluation framework must be *invented*.

All business experiments test *theories*. When there is a precedent, the theory is a statement of similarity. Mark Wilson at Ryla tested a theory that call center operations could be profitable, with numbers similar to those of his call center in the United States. When there is no precedent, the theory is original. Mr. and Mrs. Chesnes tested three theories. First, they tested a theory that a combination of transportation services with translation services would attract customers. Second, they tested the notion that customers would value TMS data, and that the increase in customer satisfaction would justify the cost. Finally, they tested the hypothesis that the Premium Freight Optimization service would satisfy customers, and that it would have a positive financial impact on their business.

Innovators learn by comparing actual outcomes with predictions. When the innovation is a major departure from the familiar, as was the case for Interchez's three innovations, it may not even be clear which outcomes to predict and measure. A crucial skill for innovators, particularly when stepping so far from the familiar, is clearly articulating the "theory of investment" or "business case" for the innovation. What specific assumptions support the investment?

For Interchez, the theory of investment in each case would have involved some estimate of the impact of the investments on variables such as the price they could charge for their services, the rate of new customer acquisition, the growth of existing client relationships, and the customer retention rate. Before making the investments, Mr. and Mrs. Chesnes could only make an estimate of these parameters. To maximize learning, they could have formally recorded their best estimates, retained those estimates, and later compared them carefully to actual results.

*Innovators learn by comparing actual outcomes with predictions. When the innovation is a major departure from the familiar... it may not even be clear which outcomes to predict and measure. A crucial skill for innovators... is clearly articulating the "theory of investment" or "business case" for the innovation. What specific assumptions support the investment?*

In practice, investments which test new theories in small companies are often made on the basis of judgment, experience, and intuition. But as companies grow, and the stakes grow larger, formal practices for articulating, recording, and formally testing theories of investment become more and more valuable.

Companies making the effort to learn from innovative experiments have seen many pitfalls. Most frequently, the effort to learn from experience is crushed by the managerial machinery designed for mature, proven operations. The core assumption underlying that machinery is that business is predictable. As a middle manager, your prediction is your promise. If you fall short, you have underperformed. But innovation is not predictable. The practice of holding managers accountable to the predictions in their plans undermines learning and unwinds motivation to innovate.

Another pitfall is that many managers lack skill in expressing, retaining, and explicitly testing the assumptions in their theories of investment. Even where those theories are clear at the time of investment, the rigor in reviewing those assumptions several months or quarters later is often lacking. It can be difficult to recover the theory that you used to justify an investment unless managers are extraordinarily diligent about documenting assumptions.

The ability to clearly document a theory of investment is a core skill of a sophisticated innovator. A rigorous subsequent practice of testing each assumption in the theory by comparing actual outcomes to predictions completes the learning loop.

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## Level 4A: Innovations Requiring New Organizational Forms

### *The Story of V-Sim, a Product of Magnys, Inc.*

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**What's Different:** At Level 4, the innovative ideas constitute new businesses that serve new customers, offer new kinds of value, or both. Level 4A innovations take a company into a market that already exists – there will be proven, profitable competition from day 1 – but the innovation gives the company a unique competitive advantage.

**Innovation Principles:** The most common stumbling block in these situations is assuming that the organizational machinery that makes a company excel in its existing business will also work in the new one. Such innovations often require building a new and separate business unit, frequently one staffed by new hires with new areas of expertise, with new job descriptions, new processes, new performance measures, and new reporting structure. It is much like launching a new company from scratch. Links between the new business unit and the established one are important, to enable the new business to leverage existing assets, but these links are common managerial trouble spots.

While the Chesnes' innovations lacked precedent, they did build upon a business that was already running, one that they understood well. The next higher level of difficulty for innovators is launching an adjacent business. The newly launched business generally leverages at least one existing asset, thus the term "adjacent," but, otherwise, the business is vastly different from what already exists. It may serve different customers, it may offer a distinct value proposition, it may be composed of a very different set of business processes, or all of the above. Past experience, particularly in evaluating business performance, is almost entirely irrelevant.

This was the case for Magnys, Inc as it launched an adjacent business.

Joe Hukan watched conveyor after conveyor move baggage through the Detroit International Airport, watching for bottlenecks and breakdowns. Mr. Hukan was not at the airport, however, and he was not watching a live video feed. In fact, the airport was still under construction. Mr. Hukan was watching computer simulations. His employer, Magnys, Inc, a minority business enterprise led by an African-American, had developed the simulations to test the baggage system design as thoroughly as possible before it was actually built.

Magnys is a professional engineering services firm with offices in Michigan, Alabama, and India. The company helps their clients, mostly manufacturing firms, particularly the automotive industry in Michigan, run their operations faster, better, and cheaper.

Magnys's professionals have deep expertise in manufacturing processes and manufacturing technology.

Clients frequently hire Magnys to build simulations of industrial systems. One client was a major automobile manufacturer that had struggled to install new conveyor systems. Schedules for installations were always tight because the company halted manufacturing operations only twice per year, for two weeks each time, to install new equipment. As a result, the supplier fully constructed the conveyor systems offsite and tested them, and then disassembled them and reassembled them during the two-week window.

Despite the thorough advance testing, installations were distressingly difficult. Conveyors in and of themselves are uncomplicated, but the control electronics for systems of dozens of conveyors were quite complicated, and it was hard to duplicate factory conditions during the offsite tests.

Magnys found a way to improve the testing process by building simulations rather than pre-assembling conveyor systems offsite. They linked the simulations directly to duplicate factory controllers, replicating actual conditions as closely as possible. The approach was faster and cut installation costs by 50 percent. It was also more reliable. The automaker succeeded in installing new systems perfectly the first time.

Mr. Huga had experience working for software companies. Naturally, he wondered, should Magnys, in addition to offering professional services that often involved building simulations, launch a simulation software product? Mr. Huga envisioned a product that professional engineers could use to simulate a wide variety of manufacturing situations. He could estimate the effort it would take to develop such a package for commercial sale. It was within reach for Magnys. After further investigating the available simulation packages on the market and concluding that Magnys could do better, Mr. Huga's interest deepened. Software businesses were higher risk than services businesses, but also had much more explosive growth potential. Mr. Huga persuaded Magnys CEO Rocco Pollifrone to take the risk.

In the book *Ten Rules for Strategic Innovators – from Idea to Execution*, the authors identify three central challenges that every company faces when launching new businesses with unfamiliar business models. The new business ("NewCo") must *forget*, *borrow*, and *learn*.

NewCo must *forget* the existing business's (CoreCo's) business model. Simultaneously, it must *borrow* CoreCo's assets. And, NewCo must *learn* how to succeed in the new and unfamiliar environment. The challenge of learning from experiments is by now a familiar theme, but forgetting and borrowing are new. These challenges are unique to high-degree-of-difficulty business experiments.

In launching a software business, Magnys would have to recognize that nearly everything it had learned about how to manage a services firm was irrelevant. Although the same technical and engineering expertise underlay both the software product and the professional services that Magnys offered, that was where the commonalities stopped. Some of the crucial differences between software companies and professional services firms include:

- *Different People.* Unlike services businesses, software businesses require commercial software development experts, customer service teams, and marketing teams with experience supporting product launches.
- *Different Organizational Structure, Different Power Base.* Professional services firms align their organizations for delivering discrete projects that meet client needs. Software firms align their organizations for developing and selling software and supporting users. Power resides in different types of managers – in client relationship managers in most professional services firms versus product managers in software firms.
- *Different Roles, Responsibilities, and Processes.* Job descriptions are different in software firms, as are expectations that core functions have of each other, and as are routines for coordinating actions across functions. The “biorhythms” of the businesses are also different. Service projects are planned week-to-week over a period of a few quarters. Software projects are planned month-to-month over a period of a few years.
- *Different Norms for Evaluating Performance.* Professional services firms can evaluate performance, project by project and month by month, based on billings and utilization rates. Software firms must take a much longer term perspective, likely evaluating long-term returns-on-investment for new software products and new releases of existing products.
- *Different Culture.* Service professionals take pride in satisfying clients. Software professionals delight in commercializing powerful products.

It is easy to underestimate the magnitude of change that is required when an innovation takes the form of an entirely new business. Building NewCo is much closer to building a new business from scratch than expanding the existing business. Only when companies take such a ground-up approach to building NewCo do they succeed in forgetting. A less aggressive approach inevitably leads to recreating organizational processes and behaviors that make sense for CoreCo but are out-of-place for NewCo.

An extreme approach to building NewCo is isolating it completely from CoreCo, but to do so is to go a step too far. NewCo must also *borrow* from CoreCo. In fact, if NewCo borrows nothing – if CoreCo has literally nothing to offer – reasonable investors could question whether that particular innovation is suitable for the company.

V-Sim, Magnys’s new software operation, certainly had something to borrow from the core business – the deep expertise in simulation possessed by Magnys’s engineers. To take advantage of the expertise, there needed to be an organizational link between V-Sim’s product development teams and Magnys’s service providers.

Such links are difficult to manage. Which takes priority? Magnys’s services or V-Sim’s development effort? In fact, Mr. Hukan and his colleagues constantly had to confront that very question, making a value judgment about which was more important – billable hours this year or the long-term potential for much bigger returns on investment for software.

NewCo may be able to persuade CoreCo to offer some help on a volunteer basis in the short term, but fundamental tensions between NewCo and CoreCo will inevitably develop. For NewCo to have the best chance at success, senior management teams must anticipate and mitigate those tensions, bulk up resources that NewCo and CoreCo both draw upon, and set clear decision rules when conflicts arise. Ongoing attention to the organizational links between NewCo and CoreCo is generally the most important contribution that the senior management team can make on NewCo's behalf. Because links are tricky to manage, NewCo is often well advised to borrow only those assets that confer a powerful competitive advantage, building everything else from scratch.

Magnys was able to navigate the tricky organizational balances that enable a NewCo to both forget and borrow. As a result, V-Sim is having a big impact and is growing. It now accounts for roughly 20 percent of the company's revenue.

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## Level 4B: Building New Businesses, New to the World

### *The CAI Story – Reprise*

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**What's Different:** Level 4B is different from level 4A only in that there is *no* precedent for the new business that is being created. The risks are higher, the timeframes are longer, and there are more dimensions of uncertainty.

**Innovation Principles:** Links between the newly launched business unit and the established one are likely to be hampered by severe tensions. Links should be minimized, perhaps to just the single most important opportunity for the new business to leverage an existing asset. Senior executives will need to be routinely involved in keeping the interactions healthy and productive.

Kusum Kavia received the news from abroad in mid-2007. CAI's new "Spirit One" electrical power generator was operational, providing two megawatts of reliable, on-site power (enough to power about 2,000 homes) for a citrus producer in Belize. CAI's customer ran 24/7, but before the Spirit One, its operations were frequently disrupted by an unreliable supply of electricity. Making matters worse, the company had to purchase the power at high prices from outside of Belize.

Able to burn natural gas, liquid propane, diesel fuel, methane, or even bio-gas, the Spirit One was flexible, self-contained, and skid-mounted for easy transport. It was an ideal solution for small industrial operations in remote locations with unreliable power. It was an ideal solution for the citrus producer in Belize, who estimated that the Spirit One would generate enough savings in electricity bills to pay for itself in less than two years.

CAI had begun investing in the development of the Spirit One seven years earlier. It was a mammoth project for a small company. With some funding from an R&D partnership, some help from suppliers and consultants, some help from the U.S. Small Business Administration and the Minority Business Development Agency, and years of dedicating every ounce of spare time and energy to the effort, CAI completed the design and pushed the product to market. Ms. Kavia described the effort:

"We never quit. This was our dream. Whatever resources we could spare we spent on the Spirit One. We had other projects to keep us going – to pay the bills – but we always had this R&D project in our shop, and we kept adding to it bit by bit."

CAI had prospered through the 1990s but in 2000 became inspired to attempt to reinvent their business once again. California had experienced rolling blackouts that summer. Some industrial companies that relied on steady sources of electricity began investigating the feasibility of building generators on-site, fully dedicated to their power needs. One of CAI's clients, Exxon-Mobil, asked them to help develop such a generator.

Excited by the challenge, CAI began researching “distributed generation” products. Some speculators in the electrical power industry believed that because small, portable generators were becoming more efficient, they would play a much larger role in the energy industry of the future. Anticipating growth in demand, CAI invested in developing the Spirit One.

Seven years later, speculation about distributed energy persisted, but the developed world had changed little. CAI discovered interested customers in unexpected places – in the developing world, first from Belize and more recently from Benin, where a new natural gas pipeline is bringing a new source of power to remote areas. CAI is competing with several other companies but has benefited from the support from the U.S. Department of Commerce and the California Governor’s Office.

The Spirit One falls into the highest degree of difficulty category. Beyond all of the technical challenges already surpassed and still to come, the organizational challenges of forgetting, borrowing, and learning will be taxing. They will be more taxing than what Magnys faced in launching vSim because the uncertainties are much greater. Not only is CAI building a new business quite dissimilar from their core business of consulting services and manufacturing services, they are targeting a new industry – distributed generation – which itself is nascent and uncertain. Not only is there no precedent for the new business within CAI, there is no precedent anywhere. CAI’s “theory of investment” must be full of uncertainties on most every dimension.

But as the difficulties rise, so do the rewards. The Spirit One has the potential to multiply CAI’s business by orders of magnitude. As it does so, CAI will make an important contribution to economic development in the poorest regions of our planet.

Onward, CAI.

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## Conclusion

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Innovation is about inspired ideas and hard work. But innovation is also a managerial discipline. The research-based body of knowledge regarding the specific practices and techniques that make up this discipline is advancing quickly.

Through a mix of sharing innovation stories in minority business enterprises and introducing frameworks and ideas from the latest research in the field of innovation, this paper has, perhaps, both stimulated you and raised your level of confidence that it is time to move forward with a clever idea that you have been sitting on for some time. For your reference, Table 1 summarizes recommendations.

The rewards to innovators are rich and play out on so many levels — personal satisfaction, financial gain, business growth, new employment, industry revitalization, economic strength, national pride.

Innovators experience the excitement that accompanies the conception of new ideas. More importantly, they experience the satisfaction borne of the sweat that turns ideas to life.

**Table 1: Innovation Principles, One Degree-of-Difficulty at a Time**

Level	Characteristics	Principles
1A	<ul style="list-style-type: none"> <li>• There is a <i>single</i> innovation idea.</li> <li>• The innovation is an improvement to the existing business or minor variation of it. Can be a process improvement or a geographic expansion to an area with uncertain characteristics.</li> <li>• The innovation does not change what you measure to evaluate the business.</li> <li>• You cannot fully predict the impact of the innovation on these measures or the impact on overall financial performance.</li> <li>• The experiment can be implemented quickly and results measured quickly (within a few months at most).</li> <li>• The innovation does not require building a new organizational sub-unit that needs people with different backgrounds, different processes, and different job descriptions.</li> </ul>	<ul style="list-style-type: none"> <li>• Measure and analyze results as quickly as possible.</li> <li>• If results are disappointing, alter the experiment if possible or discontinue it.</li> </ul>
1B	<ul style="list-style-type: none"> <li>• Similar, but experiments are much longer.</li> </ul>	<ul style="list-style-type: none"> <li>• Attempt to assess in advance whether the innovation is on a trajectory to success.</li> <li>• For every business measure, plot results as trends over time.</li> </ul>
2A	<ul style="list-style-type: none"> <li>• Similar to Level 1A, but instead of one experiment, there are many smaller experiments, possibly implemented by front-line employees.</li> </ul>	<ul style="list-style-type: none"> <li>• Rather than focus on learning at the top, focus on establishing an environment in which employees are likely to learn quickly on their own.</li> <li>• Empower employees but give them a clear innovation charter, one that is within their capabilities and within the bounds of their free time, accounting for the demands of business-as-usual.</li> </ul>

Level	Recognizing the Challenge	Advice
2B	<ul style="list-style-type: none"> <li>• Similar to Level 1B but now a sequence of similar, long-term innovation experiments.</li> </ul>	<ul style="list-style-type: none"> <li>• Over the long-term, focus on making the innovation process routine and efficient, just as you would any business process.</li> <li>• Build measures that resolve unknowns into management templates for the innovation process.</li> <li>• Be wary of what the innovation process you build is <i>not</i> capable of.</li> </ul>
3	<ul style="list-style-type: none"> <li>• Similar to Level 2B, but successive innovations are heterogeneous.</li> <li>• Innovations strengthen the existing business rather than build new ones.</li> </ul>	<ul style="list-style-type: none"> <li>• Each experiment requires a unique theory of success.</li> <li>• Crucial to clearly articulate, record and later review the specific uncertainties in that theory of success.</li> <li>• Do <i>not</i> attempt to build a repeatable innovation process. Treat each experiment as unique.</li> </ul>
4A	<ul style="list-style-type: none"> <li>• An innovative offering for an adjacent market that is well-established but in which you have never participated.</li> <li>• The new market has a distinct business model and different success drivers.</li> <li>• In moving into the new market, you leverage one or more existing assets in your firm.</li> </ul>	<ul style="list-style-type: none"> <li>• Demands <i>forgetting</i> the existing model for success. This usually requires building a distinct organizational sub-unit, which may have different reporting structures, may be filled with people with unfamiliar backgrounds and areas, may need new processes, and new job descriptions.</li> <li>• <i>Borrow</i> existing assets to succeed – those existing assets are your competitive advantage, but devote substantial senior management time and attention interfaces between the new unit and the established one. They are often problematic.</li> </ul>
4B	<ul style="list-style-type: none"> <li>• Same as Level 4A, except no firm has ever proven that the new market can be profitable.</li> <li>• Innovation may be new to the world.</li> <li>• Highest risk, highest return category.</li> </ul>	<ul style="list-style-type: none"> <li>• All advice from preceding two categories applies, but be very conservative about borrowing.</li> <li>• Minimize interfaces between the new unit and the existing business – perhaps just create one interface to leverage the single most valuable asset. Conflicts between new and existing operations will be severe and demanding for senior management.</li> </ul>

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## Appendix: Ideas about Ideas

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There are many avenues for developing ideas. Some ideas are borne of breakthrough creative thinking. In the book *Why Not?: How to Use Everyday Ingenuity to Solve Problems Big And Small* (Harvard Business School Press, 2006), authors Barry Nalebuff and Ian Ayres offer numerous specific thought processes for finding new solutions to well-known problems.

Another source of innovative ideas is insight derived from market analysis. Past papers written at the Tuck School for the Minority Business Development Agency have pointed business leaders in two specific directions, finding opportunities to build businesses in emerging economies where large multinationals have yet to build a presence,<sup>4</sup> and locating opportunities to redesign supply chains and take advantage of the most profitable links within them.<sup>5</sup>

Finally, other ideas are nursed through lengthy and expensive research and development efforts. Because these endeavors are often beyond the means of small businesses, the federal government supports such endeavors in small business through mechanisms such as the Small Business Innovation Research (SBIR) and Small Business Technology Transfer programs. In the remainder of this Appendix is one last example of a minority business enterprise, Shadowband Systems, Incorporated that tackled a complex innovation through these programs.

### **The Shadowband Systems Story**

The United States Air Force faced a challenge. Advanced internetworking technologies were enormously valuable in modern defense operations, but communications over computer networks had to be entirely secure. Communications technologies were advancing at warp speed, and the Air Force needed its security protocols to keep up.

The Air Force Research Lab in Rome, NY turned to the private sector for help with one particularly thorny information security problem. Through the Small Business Administration's (SBA) Small Business Innovation Research (SBIR) program, it solicited proposals from leaders of small companies who believed that their organizations had the capabilities to tackle the issue.

In 2002, Dr. Raymond Garcia, CEO of a information technology consulting firm, spotted the Air Force's request. He had previously hired a small team of engineers and computer programming professionals who were conducting research in a related area and felt confident he could address the Air Force's need.

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<sup>4</sup>See *Minority Business Enterprises in the Global Economy: The Business Case* by John Owens and Robert Pazornik, 2003. Prepared for the 2003 National Minority Enterprise Development (MED) Week Conference.

<sup>5</sup> See *Minority Business Enterprises Mastering the Supply Chain: A Perspective* by Quintus R. Jett, David F. Pyke, and M. Eric Johnson, 2006. Prepared for the 2006 National Minority Enterprise Development (MED) Week Conference.

### **Shadowband continued...**

Dr. Garcia also identified a related SBIR problem statement from the National Science Foundation and chose to make a proposal to both agencies.

The SBIR program is highly competitive, but Dr. Garcia won both. He used \$200,000 of Phase I funding, for feasibility studies, to start a second company, Shadowband Systems, Inc., based in Norcross, Georgia. Ultimately, Dr. Garcia won an additional \$750,000 in funding to produce a prototype information security tool dubbed ShadowDC.

SBIR proposals are intended to do more than solve the issue that the involved government agency, in this case the Air Force, needs solved. They are also intended to stimulate the economy by accelerating the development of innovations that have commercial value. Shadowband has extended the functionality of ShadowDC to meet the needs of a variety of customers, from research institutions to large corporations.

Dr. Garcia offered three suggestions for companies aspiring to win an SBIR award. First, anticipate that experts in the field will review the proposal. Second, ensure that the team of scientists and engineers looks credible and capable of solving the problem of interest. Third, write a strong commercialization plan for the innovation. That requires a discipline of staying knowledgeable about the industry in which your innovation can have an impact. Dr. Garcia elaborated:

“You need to be part of the inner circle of what other companies in the industry are doing. There are many ways. You must strive to be an industry authority, to contribute to the subject, follow industry trends, and read industry literature. You have to ensure that you do not become obsolete. You have to constantly know where your relevance is.”

The SBA’s Small Business Technology Transfer program is similar. Rather than supporting small businesses that work alone, however, it supports small businesses that work in partnership with non-profit or government research institutions, many of which are established to pursue theoretical, rather than practical ends.

Small businesses with grand visions but limited resources would do well to review current solicitations for proposals from any of the eleven agencies involved in these programs: the Departments of Agriculture, Commerce, Defense, Education, Energy, Health and Human Services, Homeland Security, and Transportation, plus the Environmental Protection Agency, the National Aeronautics and Space Administration, and the National Science Foundation. Another intriguing program is the Cooperative Research and Development Agreement (CRADA), which supports collaborations between small enterprise and federally funded research institutions. Small enterprises are not funded directly, but can gain access to personnel, services, facilities, equipment, intellectual property, and other resources.

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## Acknowledgments

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This paper combines insights from a compelling series of interviews with leaders of minority business enterprises with seven prior years of innovation research. In writing the paper, I was supported by a team that spanned both the Tuck School of Business at Dartmouth and the Minority Business Development Agency. We solicited examples of innovation from the minority business community and interviewed business leaders to understand what they did and how they did it.

I must start by thanking the dozens of innovative small business leaders who wrote to us and volunteered to speak with us. All offered compelling stories, and time permitting I certainly could have enjoyed conversations with each and every one. We conducted detailed interviews with the following eleven: Abe Abraham and George Downer, CMI Management; Mark and Charlene Chesnes, Interchez Logistics; Dr. Raymond Garcia, Shadowband Systems; Joe Hukan, Magnys; Kusum Kavia, Combustion Associates; Sanjay Kumar, vCustomer; Brenda Moore, Perk & Brew; Stacey Scott, It's Media; Hector Solis, Sol Telecommunications; Frank Venegas, The Ideal Group; and Mark Wilson, Ryla Teleservices. Constraints in space prevented us from including all of their stories here, but all provided inspiration.

I also express my gratitude to the MBDA for an enriching collaboration. Mr. Ronald Langston, National Director of the MBDA, provided high-value, targeted feedback. Ivonne Cunarro was a crucial day-to-day collaborator. In addition to dedicating hours to several close reads, offering countless improvements page-by-page, Ms. Cunarro was the engine and the energy that made this project happen, happily and smoothly.

I was supported by a terrific network of colleagues here at the Tuck School of Business at Dartmouth. Dean Bob Hansen, Professor Len Greenhalgh and Carolyn Clinton have led the Tuck-MBDA partnership for several years and made my work on this project easy and fun. Bill Little, a research assistant, participated in all of the interviews and contributed cogent insight. Beth Perkins, my administrative assistant, admirably took on the challenge of maintaining my sanity, as she does routinely and without complaint.

Finally, I'd like to acknowledge Professor Vijay Govindarajan – not just for his interest in and feedback on this paper, but for his boundless contributions to my work and my professional development over the past seven years.

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## Notes on Sources and Further Reading

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This paper relied most heavily on interviews with the minority business leaders profiled in the paper. Each of the companies profiled has informative websites for further study. See in particular [www.cai3.com](http://www.cai3.com) (Combustion Associates), [www.rylateleservices.com](http://www.rylateleservices.com) (Ryla), [www.vcustomer.com](http://www.vcustomer.com) (vCustomer), [www.interchez.com](http://www.interchez.com) (Interchez), [www.shadowband.com](http://www.shadowband.com) (Shadowband), and [www.magnys.com](http://www.magnys.com) (Magnys).

This paper also relied heavily on research in the field of innovation conducted by Professors Vijay Govindarajan and Chris Trimble:

Vijay Govindarajan and Chris Trimble, *Ten Rules for Strategic Innovators: From Idea to Execution*, Boston: Harvard Business School Press, 2005.

Vijay Govindarajan and Chris Trimble, "Building Breakthrough Businesses Within Established Organizations," *Harvard Business Review*, May 2005, pp. 58-68.

Vijay Govindarajan and Chris Trimble, "Strategic Innovation and the Science of Learning," *MIT Sloan Management Review*, Winter 2004, pp. 68-75.

Vijay Govindarajan and Chris Trimble, "Organizational DNA for Strategic Innovation," *California Management Review*, Spring 2005, pp. 47-76.

All of these books and articles are based on a series of in-depth innovation case studies about the following companies: Analog Devices, The New York Times Company, Corning, Hasbro, Cisco, Stora-Enso, Unilever, Deere & Company, Infosys, Thomson Corporation, Dow Jones, IBM, Nucor, Southwest Airlines, Dell, and Wal-Mart. Most case studies are available on the Tuck School website today. The URL is [www.tuck.dartmouth.edu/cgl](http://www.tuck.dartmouth.edu/cgl).

The brief observations about Toyota included in this article are drawn from:

Stephen Spear and H. Kent Bowen, "Decoding the DNA of the Toyota Production System," *Harvard Business Review*, September 1999, pp. 56-67.

The following list of sources is for further exploration. It includes references specific to minority business enterprises plus books and articles that have been most influential in developing the point-of-view on innovation outlined in this paper.

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## Author

Chris Trimble broke into the forefront of executive consciousness with the blockbuster article that led the May 2005 *Harvard Business Review*, "Building Breakthrough Businesses within Established Organizations." The article is adapted from Vijay Govindarajan and Chris's December 2005 book *Ten Rules for Strategic Innovators – from Idea to Execution*. In June 2006, the *Wall Street Journal* published a Top Ten Recommended Reading list that included *Ten Rules* alongside *Freakonomics*, *The Tipping Point*, and *Blink*. Later that year, *Strategy & Business* magazine recognized *Ten Rules* as the best strategy book of the year.

Chris is on the faculty at the Tuck School of Business at Dartmouth and a Senior Fellow at Katzenbach Partners LLC, a management consulting firm. He has published in the *MIT Sloan Management Review*, *California Management Review*, and *Across the Board*, and has written for *Fast Company* and *The Financial Times*. Chris is a frequent speaker on the topic of innovation, and has spoken all over the world.

## Tuck School of Business at Dartmouth

Founded in 1900, the Tuck School is the first graduate school of business and consistently ranked one of the top management schools in the world. Tuck's faculty members are outstanding scholars with a passion for teaching and research. At the cutting edge of their disciplines, they are highly regarded for their expertise in key areas of business practice.

Tuck combines the intellectual and competitive strength of a large university with the soul of a tightly knit community. Tuck offers only one degree program – the full-time MBA – and a select array of executive education and other non-degree programs. This focus allows Tuck to consistently offer outstanding educational experiences to its students.

Key among these offerings are Tuck's minority business executive programs [which](#) were the first of their kind when they debuted in 1980. The mission was to help minority-owned companies grow by offering their senior executives the same high-caliber educational experience available to Fortune 500 corporations. There are now over 4,000 alumni who have used the tools and strategies they learned at Tuck to develop and strengthen their businesses, and to create jobs and wealth in their communities.

## **Minority Business Development Agency**

The U.S. Department of Commerce's Minority Business Development Agency (MBDA) is the only Federal agency established to foster the establishment and growth of minority-owned businesses in America. Created in 1971, MBDA provides services to African American, Asian American and Pacific Islander, Hasidic Jew, Hispanic, and Native American and Alaska Native entrepreneurs.

The vision of MBDA is to serve as an entrepreneurial organization serving entrepreneurs. MBDA's mission is to achieve entrepreneurial parity for minority business enterprises (MBEs) by enhancing their growth and expansion.

Since its inception, MBDA has provided business development services to minority entrepreneurs and developed research and information about the minority business community. The agency coordinates and leverages public and private-sector resources in support of its mission.

Over the past several years, MBDA has focused on fostering business-to-business forums and services for minority entrepreneurs who are pursuing strategic accelerated growth. These entrepreneurs are well-positioned to impact the local economies by creating jobs and generating significant revenues, and expanding into national and global markets.

In fiscal year 2006, MBDA provided services to over 20,000 clients. The agency facilitated nearly \$1.6 billion in contracts and financings for MBDA clients, which resulted in the creation of over 4,200 new jobs in that fiscal year.

## **Tuck School and MBDA Partnership**

Through a grant from the U.S. Small Business Administration, the Tuck School of Business and the Minority Business Development Agency (MBDA) have been working in partnership on a number of programs designed to enhance the effectiveness, efficiency, and growth of minority-owned businesses. Among these, Tuck faculty members conduct research studies that explore issues related to the emergence, survival and prosperity of minority-owned businesses and their future impact on local and global economies. The current study entitled, "*The Sophisticated Innovator, Practical Insights from Provocative Stories of Innovation in Minority Business Enterprises,*" is the fourth paper written in collaboration with MBDA.

In partnership with MBDA, Tuck also provides executive training for minority business enterprises (MBEs) as well as training for business development consultants in its network of funded agencies. Through the executive training program, MBDA's MBE clients learn from some of the best faculty in the world and network with successful minority-owned businesses, potential suppliers, customers, and partners.



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