Thinking About Thinking
10th Annual Rotman Life-Long Learning Conference
Friday, May 30, 2008
Four Seasons Hotel Toronto

Register now for our 10th Annual Rotman Life-Long Learning Conference on May 30. The theme is “Thinking About Thinking.” We’re pleased to offer:

Conference Chairman:
Roger Martin, Dean and Professor, Rotman School of Management and Author, “The Opposable Mind: How Successful Leaders Win Through Integrative Thinking” and “The Responsibility Virus: How Control Freaks, Shrinking Violets – and the Rest of Us – Can Harness the Power of True Partnership”

“The Power of Thinking Without Thinking”
Malcolm Gladwell, Staff Writer, The New Yorker Magazine and Author, “Blink: The Power of Thinking Without Thinking” and “The Tipping Point”

“Observations on Our Thoughtless Acts”
Jane Fulton Suri, Co-Chief Creative Officer and Director, Human Factors Team, IDEO and Author, “Thoughtless Acts?: Observations on Intuitive Design”

“Think Deep: Navigating the Unconscious Mind”

“Thinking About Your Firm’s Performance When You’re Thinking About Thinking”
Anita McGahan, Professor of Strategic Management, Rotman School of Management and Author, “How Industries Evolve: Principles for Achieving and Sustaining Superior Performance”

“Predictably Irrational: The Hidden Forces That Shape Our Decisions”
Dan Ariely, Professor of Behavioral Economics, Fuqua School of Business, Duke University and Author, “Predictably Irrational: The Hidden Forces That Shape Our Decisions” (Feb 2008)

Confirm your attendance today by registering at www.rotman.utoronto.ca/thinking

We look forward to seeing you on May 30th!
Upcoming Events
Complete details are available at www.rotman.utoronto.ca/events

January 2008
January 15, 5:00-6:15pm
Rotman Operations Strategy Speaker Series
Speaker: Mark Foote, (MBA 91), President and Chief Merchandising Officer, Loblaw Companies Limited

February 2008
February 13, 5:00-6:15pm
Martin Prosperity Institute @ Rotman Speaker Series
Speaker: Gordon Nixon, President and CEO, RBC Financial Group and “Canada’s Outstanding CEO of the Year for 2007”
February 21, 22 and 23, 2008
annual Rotman International MBA Trading Competition

March 2008
March 7, 5:00-6:15pm
annual International Women’s Month Lecture @ Rotman
Speaker: TBA
March 13, time TBA
Forum on U.S./Canada Exchange Rates
Keynote Speakers: David Dodge, former Governor, Bank of Canada; Alan Greenspan, former Chairman, Federal Reserve Bank
March 14, 12:30-6:00pm
annual Rotman MBA Leadership and Social Change Conference and Career Fair
Keynote Speaker: Tom McAllister, (MBA 82), President and CEO, KidsHelpPhone
March 26, time TBA
annual Rotman MBA Finance Association and Rotman MBA Asset Management Association Case Competition

April 2008
April 7, 5:00-6:15pm
annual World Health Day Lecture @ Rotman
Speaker: Alan Bernstein, Executive Director, Global HIV Vaccine Enterprise
April 10, 6:00-7:30pm
Rotman Master of Finance Speaker Series
Speaker: Richard Lindsey, President and CEO of the Callcott Group, LLC; Chairman, International Association of Financial Engineers

May 2008
May 29, 6:00-11:00pm
annual Rotman Alumni Reunion Gala
Place: Four Seasons Hotel Toronto
Details:
6:00-7:00pm, reception in honour of the MBA classes of 68, 88, 98 and 03 to celebrate their 40-year, 20-year, 10-year and 5-year Reunions,
7:00-8:30pm, dinner, open to all Rotman alumni and guests,
8:30-11:00pm, dancing
May 30, 8:30am-4:30pm
10th annual Rotman Life-Long Learning Conference
Topic: “Thinking About Thinking”
Place: Four Seasons Hotel Toronto
Speakers: Dan Ariely, Professor of Behavioral Economics, Fuqua School of Business and Author, Malcolm Gladwell, Staff Writer, The New Yorker Magazine and Author, Roger Martin, Dean and Professor of Strategic Management, Rotman School and Author, Anita McGahan, Professor of Strategic Management, Rotman School and Author, Jane Fulton Suri, Co-Chief Creative Officer and Director, Human Factors Team, IDEO and Author, Gerald Zaltman, Professor Emeritus of Marketing, Harvard Business School and Author.
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Winter 2008

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- Edward de Bono, p.72

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Thinking about Thinking

WITH EACH PASSING DAY, the pace of change continues to quicken, requiring that we continually learn and relearn, rethink our decisions, and re-evaluate the way we work and live. In such an environment, the power of our minds to regularly engage in self-analysis will increasingly determine the quality of our work, our lives, and perhaps even our very survival.

No matter what our circumstances or goals, one simple truth applies: we will be better-off if our thinking is skilled. Unfortunately, serious thinking about thinking is rare. When was the last time you asked yourself where your thinking comes from, and how much of it is good quality? If we are to maximize the quality of our thinking, we must first learn how to become effective critics of it; and to achieve that, we must make learning about thinking a priority. This issue of Rotman attempts to get the ball rolling.

Researchers have found that 95 per cent of our thinking takes place in our subconscious mind. The key repercussion is that if we aren’t aware of our thinking, we have no opportunity to correct it. Behind every business plan – and every life – lies a gaggle of mental models, unconsciously shaping our decisions. These deeply-ingrained images of ‘how things are done’ are so deeply internalized that we often fail to adjust them even when they are no longer relevant. It is therefore critically important to challenge the mental models we espouse and encounter on a regular basis. On page 4, in an excerpt from my new book, I discuss Choices, Conflict and the Creative Spark.

Renowned thinker and Harvard Professor Emeritus Chris Argyris – whom I consider one of my mentors – has dedicated his career to studying the relationship between thought and action. In our Thought Leader Interview on page 10, he explains how the thinking within firms often leads to ‘organizational defensive routines’ and ineffective action.

Business strategists tend to be well-versed in the identification and analysis of constraints. But what about possibilities? Jeanne Liedtka of the Darden School of Business and her co-author argue that the ability to see new possibilities is fundamental to creating innovative business designs, in Possibility Thinking: Lessons from Breakthrough Engineering, on page 14.

Today’s digital machines can outperform the human mind on many tasks, but they will never be capable of Integrative Thinking. Desautels Centre for Integrative Thinking Director Mihnea Moldoveanu explores Integration: the Value of Managerial Thinking in an Age of Technical Reason on page 32.

Elsewhere in this issue, Harvard’s Teresa Amabile uncovers the Inner Work Life on page 20; we feature an excerpt from University of Toronto Psychiatrist Norman Doidge’s The Brain That Changes Itself on page 40; IDEO Co-Chief Creative Officer Jane Fulton Suri discusses the importance of Informing Our Intuition on page 52; Wharton’s George Day and Paul Schoemaker describe how to detect weak signals on the periphery of our environment on page 64; and beginning on page 69, our Idea Exchange features 12 thought leaders including Edward de Bono, Robert Sternberg and Ellen Langer.

The truth is that most of us are not skilled questioners; we tend to accept the world as it is presented to us. Good thinkers question the status quo on a regular basis: they recognize that things are very often different from the way they are presented. We must always be on the lookout for questions – the ones we ask, and the ones we fail to ask.

At the Rotman School, improving the thinking skills of tomorrow’s leaders is our highest goal. While we continue to progress in cracking the code of Integrative Thinking and weaving it into our curriculum, our journey is ongoing. In the end, the extent to which any of us develops as a thinker is directly determined by the amount of time we dedicate to our development, the quality of the intellectual practice we engage in, and the depth of our commitment. In this spirit, we are offering a day-long conference on May 30th called Thinking About Thinking (see our back cover for details). We hope to see you there.

As renowned thinker and cover subject Albert Einstein once said, “We cannot solve problems by using the same kind of thinking we used when we created them.” We hope that this issue can serve as a starting point for a new way to think about solving problems, big and small.
Integrative Thinking is a skill possessed by people who have cultivated their ‘opposable mind.’ Roger Martin explains in this excerpt from his new book.

**CHOICES, CONFLICT, AND THE CREATIVE SPARK:**
THE PROBLEM-SOLVING POWER OF INTEGRATIVE THINKING

*By Roger Martin*
It was September, 1999, and Michael Lee-Chin had a serious crisis on his hands – the worst of his business career. Lee-Chin had presided over more than 10 years of remarkable growth at his beloved money-management firm, AIC Limited, but now AIC was under withering attack. Its very survival was in doubt.

An admirer of Warren Buffett, Lee-Chin had pursued a strategy with virtually no parallel in the mutual fund business. The typical mutual fund manager holds 100 to 200 different stocks at any given time and turns over the entire portfolio every 18 months or so. But emulating Buffett’s approach of taking long-term stakes in a relative handful of companies, Lee-Chin’s AIC Advantage Fund would hold only 10 to 20 stocks and hang onto them, as he says, “more or less forever.” This ‘Buy, Hold, And Prosper’ philosophy worked brilliantly, and by 1999, assets under management had grown to $6 billion.

But in 1999, everything was different. Investors were clamouring to buy Internet service providers and dot-coms, day-trading was suddenly respectable, and a mutual fund with a buy-and-hold philosophy and a portfolio of financial, manufacturing and grocery-store stocks seemed hopelessly old-fashioned and out of step. Many investors lost faith in AIC’s approach, and for the first time in its history, the Advantage Fund was suffering substantial net redemptions: more money was flowing out than new money was flowing in.

The low point for Lee-Chin arrived on the morning of September 2, 1999, when he opened his newspaper to find one of the most influential business columnists in Canada trashin AIC’s basic business model and calling on investors to get out while their holdings were still worth something. The article predicted that to raise enough cash to meet the tide of redemptions, AIC would have to sell many of Advantage Fund’s holdings and a stock he and his staff knew well. “We did everything to buy Mackenzie,” he recalled. “The share price went from $15 to $18 overnight. The rest is history. Mackenzie was sold [in April 2001] for $30. Our unit holders made $400 million, and we made a handsome return.”

His move didn’t just save AIC, it helped the firm become Canada’s largest privately-held mutual fund company, in the process making him a billionaire and providing him with the wherewithal to buy and turn around the National Commercial Bank, Jamaica’s largest bank, and fund philanthropic projects in Jamaica, Canada, and beyond.

The Integrative Thinker’s Advantage

The lessons of AIC’s cash crisis and Lee-Chin’s response to it may seem to have limited application to other business dilemmas. But this bold counter-attack wasn’t just a spur-of-the-moment gamble by a swashbuckling entrepreneur in response to an unrepeatable set of circumstances. The thinking process that he followed is, I believe, common to some of the most successful people in the business world today, whatever their domain.

I have spent the past 15 years, first as a management consultant and then as the dean of a business school, studying leaders with exemplary success records, trying to discern a shared theme running through their successes. Over the past six years, I have interviewed more than 50 such leaders, and as I listened to them, a common theme emerged with striking clarity. These leaders share at least one trait: the predisposition and the capacity to hold two diametrically-opposed ideas in their heads. And then, without panicking or simply settling for one alternative or the other, they are able to produce a synthesis that is superior to either opposing idea.
Integrative Thinking is my term for this process that is the hallmark of exceptional businesses and the people who run them.

As I listened to some of the sharpest minds in business talk, I searched for a metaphor to provide deeper insight into the dynamic of their thinking. The skill with which these thinkers held two opposing ideas in fruitful tension reminded me of the way other highly-skilled people use their hands. Human beings, it’s well known, are distinguished from nearly every other creature by a physical feature known as the ‘opposable thumb’: thanks to the tension that we can create by opposing the thumb and fingers, we can do marvelous things that no other creature can do – write, thread a needle, paint a picture, guide a catheter up through an artery to unblock it. All of these actions would be impossible without the crucial tension between the thumb and fingers.

Evolution provided human beings with a valuable potential advantage. But that potential would have gone to waste if our species had not exploited it by using it in ever-more sophisticated ways. When we set out to learn to write or to sew, paint or golf, we practice using our opposable thumbs, training both the key muscles involved and the brain that controls them. Without exploring the possibilities of opposition, we wouldn’t have developed either its physical properties or the cognition that accompanies and animates it.

Similarly, I believe that we were born with an ‘opposable mind’ that we can use to hold two conflicting ideas in constructive tension, and that we can use that tension to think our way through to a new and superior idea. Were we only able to hold one thought or idea in our heads at a time, we wouldn’t have access to the insights that the opposable mind can produce. And just as we can develop and refine the skill with which we employ our opposable thumbs to perform tasks that once seemed impossible, I’m convinced we can also, with patient practice, develop the ability to use our opposable minds to unlock solutions to problems that seem to resist every effort to solve them.

I won’t go so far as to say that every problem will find a resolution as brilliantly elegant and successful as the one that Michael Lee-Chin arrived at. But in our working lives, we often face problems that appear to admit of two equally-unsatisfactory solutions. Using our opposable minds to move past unappetizing alternatives, we can find solutions that once appeared beyond the reach of our imaginations.

I’m hardly the first to notice this remarkable capacity of the human mind. Sixty years ago, F. Scott Fitzgerald saw “the ability to hold two opposing ideas in mind at the same time and still retain the ability to function” as the sign of “a first-rate intelligence.” That last phrase is telling. In Fitzgerald’s view, only people with the highest levels of native intelligence have the capacity to use their opposable minds to create new models.

Fitzgerald, I think, is too quick to suggest that the opposable mind is exclusive to geniuses. My view is closer to that of another student of the opposable mind, Thomas Chamberlin. A scholar and naturalist, Chamberlin in 1890 proposed the idea of “multiple working hypotheses” as an improvement over the most commonly-employed scientific method of the time, the “working hypothesis,” by which the scientist tests the validity of a single explanatory concept through experimentation. In an article published in Science – then as now one of the world’s most prestigious peer-reviewed scientific journals – Chamberlin wrote:

In following a single hypothesis, the mind is presumably led to a single explanatory conception. But an adequate explanation often involves the coordination of several agencies, which enter into the combined result in varying proportions. The true explanation is therefore necessarily complex. Such complex explanations of phenomena are specially encouraged by the method of multiple hypotheses, and constitute one of its chief merits.

Interviews with more than 50 great leaders have led me to concur with Chamberlin and Fitzgerald: thinkers who exploit opposing ideas to construct a new solution enjoy a built-in advantage over those who can consider only one model at a time.

The ability to use the opposable mind provides an advantage at any time, in any era, but it may be more than an advantage in today’s world. In this information-saturated age, where each new bit of data complicates a picture that is already staggeringly complex, Integrative Thinking may be a necessity if we are ever to find our way past the multiple binds in which we find ourselves. Certainly the business world seems ripe for a new approach to problem-solving.

In business, we often look at decisions as a series of ‘either/or propositions,’ or trade-offs: we can either have steady growth or we can pioneer adventurous new ways of designing, building and selling things; we can either keep costs down, or invest in better stores and service; either we can serve our shareholders, or our communities. But what if there were a way to satisfy both customers and shareholders without sacrificing the needs and interests of either party? What if we could find a way to meet demands for growth and still be a responsible steward of the environment? To pursue innovation while maintaining the continuity that large organizations need to function effectively?

Integrative Thinking shows us a way past the binary limits of ‘either/or.’ It shows us that there is a way to integrate the advantages of one solution without canceling out the advantages of an alternative solution, affording us, in the words of the poet Wallace Stevens, “the choice not between, but of.”

All the Comforts of Home

Integrative Thinking is what enabled Isadore Sharp to found and build the largest and most successful chain of luxury hotels in the world, Four Seasons Hotels and Resorts Ltd. Sharp’s first lodging property; a smallish roadside motel outside the core of downtown Toronto, was anything but the model for a present-day Four
Seasons; neither was one of his next projects, a large convention hotel in the heart of Toronto.

While the two properties represented the two dominant models prevailing at the time in the global hotel industry, Sharp found himself increasingly frustrated by the business propositions underlying both models: he loved the intimacy and comfort of his small motel, but with only 125 rooms, it didn't generate enough revenue to cover the cost of the meeting rooms, restaurants, and other amenities that business travelers valued. By the same token, he loved that his big convention hotel could provide its guests with every amenity they could desire; but with 1,600 rooms, it couldn't offer the personal touches that made his motel such an agreeable place to stay.

The two types of lodging stood in fundamental and apparently irreconcilable conflict: guests could choose the small motel's intimacy and comfort or the large hotel's location and range of amenities, but no hotel could offer the best of both worlds. So just about everyone in the lodging business chose one type or another, accepting the drawbacks that came with their choice. But not Issy Sharp: rather than choose one model or the other, he used his opposable mind to create a new model, a hotel with the intimacy of his original motor inn and the amenities of a large convention hotel.

Solving the Pricing Paradox at P&G

When Procter & Gamble CEO A.G. Lafley took the helm in June of 2000, the venerable consumer products maker was floundering. Its growth had slowed almost to a standstill, and seven of its top ten brands were suffering market share declines. The company was spending more and more on research and development but introducing fewer and fewer innovations. It had lost touch with the consumer.

Much of the well-meaning advice offered to Lafley proceeded from the assumption that the company's costs were out of control. This school of thought saw store brands and other low-cost alternatives as P&G's primary competitive threat, and low prices as its logical competitive response. Drastic cost cuts were necessary to make the low prices sustainable. Lafley didn't necessarily disagree.

An opposing school of thought, meanwhile, held that P&G had stopped innovating. The only route to success, to this way of thinking, was to use innovation to differentiate P&G from its cut-price competitors, charge premium prices, and restore profitability. Lafley saw the sense of that argument as well. His easiest course would have been to tell employees, retailers and consumers that P&G had opted for one alternative or the other: low costs and aggressively-low pricing or intensive innovation investment, sharp brand differentiation, and premium pricing.

Like Lee-Chin and Sharp, Lafley chose neither – and both. He concluded that P&G needed to pare costs and become more price-competitive; but he also concluded that it needed to emphasize the innovation that would make its brands clearly superior to the competition's. Over the next several years, he eliminated layers of management, cut the size of functional units, outsourced where outsiders were more cost-effective, promoted inspiring young managers, sharpened their focus on capability-building, and instilled a relentless focus on generating cash and cutting costs.

At the same time, he tirelessly communicated his passion for delighting customers and delivering superior value to them. For the first time in P&G's history, he made design a point of emphasis, and he pioneered a new approach to innovation that strengthened the company's brands, enabling it to charge more for its products. Before long, P&G was selling soaps, detergents, and toiletries at prices attractive in relation to those of store brands and discount offerings, while at the same time, introducing premium products like Olay Regenerist skin cream, which cost an unheard-of $25 for a three-ounce bottle.

These leaders share at least one trait: the capacity to hold two diametrically-opposed ideas in their heads. And then, without panicking or simply settling for one alternative or the other, they are able to produce a synthesis that is superior to either opposing idea.
What kind of mind could weave together a unified strategy from two such different lines of thought? An innocuous-sounding comment from Lafley furnishes an important clue. “I’m not an either/or kind of guy,” he once told me. The results of thinking in terms of ‘and’ rather than ‘or’ have been breathtaking: Lafley has led P&G to consistently strong organic growth, double-digit profit growth and a doubling of the company’s stock price within four years.

Thinking vs. Doing

My emphasis on thinking is not necessarily widely shared by business theorists and practitioners. In recent years, the dominant question addressed for the would-be leader is “What should I do?” rather than “What should I think?” The bias toward action is easily discerned in the three of the most influential business leadership books of recent years: Execution: The Discipline of Getting Things Done by Honeywell CEO Lawrence Bossidy and consultant Ram Charan; Good to Great by professor-turned-guru Jim Collins; and Straight from the Gut by Jack Welch, the former super-CEO of General Electric.

All three books stress action over strategy and describe the mindset that produces effective action: for Bossidy and Charan, the leader’s mind must be focused on execution and following through, to the exclusion of almost everything else; Collins’s ideal mindset combines fierce will with personal humility; and the mindset that Welch advocates is consumed with aiming high and settling for nothing less than winning.

I would never dispute the importance of doing: thinking without doing is of little value. However, even on their own terms, it is difficult to come away from these three books with a compelling and practical prescription for what the would-be leader ought to do.

Following the logic of Bossidy and Charan is a challenge. Despite scoffing at leaders who focus on strategy rather than execution, they end up conceding that strategy is integral to execution. Because they cannot maintain a meaningful distinction between strategy and execution, the thing they call ‘execution’ quickly morphs into a laundry list of everything a leader must do: strategy plus operations plus people management. Their theory is also undermined by the fate of the executives they chose as exemplars of superior execution, two of whom were fired for dreadful performance shortly after the book was published.

After Execution, Collins’s advice is refreshingly restrained and straightforward. He explains what a ‘Level 5 Leader’ does, but he freely admits that he can’t yet tell readers how to become Level 5 leaders themselves. “For your own development,” he writes, “I would love to be able to give you a list of steps for becoming Level 5, but we have no solid research data that would support a credible list.”

Welch is particularly interesting. He was one of my interviewees in the Rotman Integrative Thinking Seminar Series, and I came away seeing him as an exemplary integrative thinker. But I wouldn’t advise trying to figure out how he thinks from what he did. Early in his tenure as CEO, Welch insisted that each of GE’s businesses be number one or number two in market share in its industry. He eventually noticed that his business unit leaders gamed the system he created by defining their markets in such a way that they were guaranteed the number one or two spot. Later in his career, he insisted that his businesses define their market share to be lower than 10 per cent. He figured that business leaders would be quicker to spot market opportunities if they envisioned their market as much larger than their share of it. In this respect, Welch is an exemplary integrative thinker, secure enough to encounter changing circumstances without an inflexible ideology, and adaptable enough to change his approach when presented with new data. But emulating what Jack Welch did would invite confusion and incoherence, since he pursued diametrically opposed courses at different points in his career.

I don’t wish to denigrate any of the books I’ve mentioned: each offers a particular perspective, and each is valuable. But to approach every business problem with the question, “What should I do?” is to foreclose options before they can even be explored. Instead of attempting to learn from observing the actions of leaders, I prefer to swim upstream to the antecedent of doing: thinking. My critical question is not what various leaders did, but how their cognitive processes produced their actions.

Cultivating the Opposable Mind

An important question remains: is Integrative Thinking unteachable, or is it merely un-taught? Is it a function of pure intelligence, as Fitzgerald would have it, or of dedication and practice, as Chamberlin suggests?

My own classroom experience suggests – but does not prove – that people can be taught to use their opposable minds and grow more skilled and confident with practice. But it is clear that Integrative Thinking is untaught: the world has not organized itself to produce integrative thinkers as it does brain surgeons or computer engineers. Integrative Thinking is largely a tacit skill in the heads of people who have cultivated their opposable mind. Many of those people don’t appear to know how they are thinking or that it is different from the common run of thought. They just do it. But an outsider such as myself can observe and analyze their thinking process, and from this conscious, systematic study, a method of teaching that process is starting to emerge.

Roger Martin is dean, professor of Strategic Management, Premier’s Chair in Competitiveness and Productivity and director of the AIC Institute for Corporate Citizenship at the Rotman School of Management. His second book, The Opposable Mind: How Successful Leaders Win Through Integrative Thinking, was published by Harvard Business School Press in December.
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You have dedicated your career to studying the connections between thought and action. What are some of your key findings?
What I am most interested in is how people produce action that is effective, and by effective I mean action that leads to the consequences people desire – consequences that persist. In our minds, all human beings hold what might be labeled ‘micro theories’ of action that specify what ‘effective action’ is and how to produce it in any type of situation, whether it be as a leader, a follower or a peer. How do we produce behaviour? Through the use of our minds. How does the mind produce behaviour? By designs that are programmed into it, which can be warehoused and then retrieved. These are ‘causal’ designs, whereby doing one thing will cause something else to happen. It may surprise people, but I have found that we all have a strong propensity to hold inconsistent thoughts and actions, and that we aren’t very effective observers of our own behaviour: we tend to judge our behaviour by our intentions, while we judge other people’s behaviour by its outcomes.

Talk about the difference between an ‘Espoused Theory’ and a ‘Theory-in-Use.’
Human beings hold two types of theories in their heads: there is the one that they espouse – their stated beliefs and values; and there is the theory that they actually use, which can only be inferred from observing their behaviour. Espoused Theory is what an individual actually believes in. People say to themselves, ‘this is what I believe is effective action in this situation, and these are the values that I believe I should express when I manage people or when I manage myself.’ This type of thinking mostly works when people are dealing with routine issues: in these cases, what they say they believe and how they actually behave is pretty much the same.

However, when it comes to complex issues – issues that can cause embarrassment, or may represent a threat to a person or an organization – espoused theories almost never operate. What does operate is the theory that people actually use, which I call their Theory in Use. These are the theories of action that are implied by our behaviour, and they are likely to be unknown to us. We all possess a strong propensity to hold inconsistent thoughts and actions: the difference between espoused theories and theories-in-use applies at the level of national strategies, organizational strategies and small group and interpersonal behaviours. People become skillfully blind about the inconsistency between their espoused theories and their theory-in-use. They may become aware of it afterwards, but while they’re producing the behaviour they are rarely aware, and the end result is that our behaviour is often less effective than it could be.

What are ‘governing values,’ and how do they affect our thinking?
Governing values are the underlying values that people use to design their actions – goals that we seek to satisfy, beliefs we seek to operationalize or defend and values we seek to express. My colleagues and I have found that these values fall under two categories or ‘worldviews’: Model I and Model II.

Model I represents the actions of almost all human beings. There are four key governing values in this mindset, and we have found that they do not vary by age, sex, culture, organization or wealth. They are:

1. To be in control of one’s environment
2. To seek to win and not lose
3. To suppress negative feelings, and
4. To be as rational as possible

The renowned organizational learning expert explains why our actions are often not consistent with our thoughts, and why defensive reasoning is so prevalent in today’s organizations.
The problem is that when they join an organization, individuals using this worldview create what we call ‘defensive routines’: they sanction and reward self-protective actions and reinforce a unilateral, top-down model. This often leads to skilled incompetence that produces escalating error, self-sealing processes and self-fueling processes. At the same time, people are unaware that they are doing this, and a key cause of their unawareness is the defensive reasoning mindset that accompanies Model I.

**What is ‘defensive reasoning’?**
Reasoning is defensive when its purpose is to protect someone— a person or a group—from being embarrassed or threatened. When people reason in this way, they keep their inferences tacit, lest they lose control; they create ‘tests’ of their claims that are self-serving and self-sealing, failing to design corrective actions and evaluate the effectiveness of their implementation. The worst part is that the use of defensive reasoning prohibits questioning our reasoning. This leads to self-fueling processes that serve to maintain the status quo, inhibit genuine learning, and reinforce deception. Self-referential logic is a key aspect of this type of reasoning: the logic used to create the claims is the same as the logic used to test them.

Productive reasoning, on the other hand, seeks truth about the effectiveness of what we do and what we claim. It gives rise to questioning causality, testing methodology, the notion of transparency, and so on. Self-referential logic combined with a lack of transparency and bolstered by the belief that we are acting in the name of ‘concern’ or ‘caring’ is a recipe for disaster for the learning required to correct problems in an organization. Unfortunately, the prevailing culture today is Model I, and so are many of the organizations and social systems within it.

**Can you describe what an ‘organizational defensive routine’ looks like?**
There is a fundamental logic underlying all such defensive routines, and it can be illustrated by one of the most frequently-observed defenses: sending mixed messages: “Mary, you run the department, but make sure to check with Bill”; “John, be innovative, but please be careful.” The logic here is as follows:

1. **Send a message that is inconsistent**
2. **Act as if it is not inconsistent**
3. **Make 1 and 2 undiscussable, and**
4. **Make the undiscussability undiscussable**

Organizational defensive routines are caused by a circular, self-reinforcing process in which Model I theories-in-use produce individual strategies of ‘bypass’ and ‘cover up’, which result in organizational bypass and cover up—which only serves to reinforce the individual theories-in-use.

**What are the consequences of the Model 1 mindset in organizations?**
People programmed with Model I theories of action produce organizational dynamics that include avoidance, uncertainty, mistrust, conformity, face-saving and miscommunication. The fundamental consequence of all this is that people withdraw—they play it safe and try not to make waves. In this environment, people hesitate to be honest, and the undiscussable gets covered up. Protection of one’s ‘bureaucratic skin’ becomes critical to survival, driving some of the most important dialogue underground.

**Do you feel that most of today’s leaders suffer from this mindset?**
I’m afraid so. The most typical leadership style is Model I leadership, and the most prevalent action strategies that arise from it are the following:

- Advocate your position
- Evaluate the thoughts and actions of others, and
- Attribute causes for whatever you are trying to understand

Unfortunately, this approach is often viewed as ‘strong’ leadership—the ability to bully others into agreeing with your way of thinking. The fact is that the job of an effective leader is still to advocate, evaluate and make attributions, but to do so in a way that corresponds to reality, that can be tested. You accomplish this by inviting others to confront your views and conclusions.

**What is the antidote to the Model I mindset?**
We must help people become skillful at what I call ‘Model II’ thinking and behaviour. Model II governing values include:

- Obtaining valid information
- Creating conditions for free and informed choices, and
- Accepting personal responsibility for one’s actions

Model II action strategies include advocating, evaluating and attributing in ways that combine inquiry and public testing. This is a much more collaborative approach, and much less defensive. Model II allows one to reflect on the self-fulfilling nature of the model itself and to take corrective actions. The end result is the reduction of self-sealing processes and more effective problem solving.

**How can managers foster a Model II approach in their workplace?**
Any environment that rewards participation, joint problem-solving and openness can be expected to move towards Model II. I am not proposing that people completely drop Model I and accept only Model II. I am suggesting that Model II is important for difficult, unprogrammed, non-routine decisions. Organizations can create conditions that significantly influence what individuals frame as the problem, design as a solution and produce as the action to solve a problem. Moving from Model I toward Model II requires not only changes in actions, it requires changes in governing values and action strategies. This, in turn, requires what I call ‘double-loop learning.’

**What is ‘double-loop learning’?**
Model I only allows for ‘single-loop learning’: maintaining the field of constancy by generating new action strategies to achieve existing
governing values. Whenever an error is detected and corrected without questioning or altering the underlying values of the system, the learning is single-loop. Single-loop learning is appropriate for routine, repetitive issues – it helps get the everyday job done.

Double-loop learning, on the other hand, allows you to tackle problems that are complex, ill-structured, and that change as problem-solving advances. With this type of learning, we learn to change the field of constancy itself by changing underlying values and assumptions: assumptions underlying current views are questioned, and hypotheses about behaviour are tested publicly. The end result should be increased effectiveness and better acceptance of failures and mistakes.

For example, one strategy to suppress conflict in a group might be for a manager to reprimand the people involved for wasting time, and suggest that they get on with the task at hand. This may suppress the conflict and allow feelings of competence in the manager, as the fault has been laid at the feet of the other parties. In such a case, a new action strategy is used in order to satisfy existing governing values (‘unilateral control’ and ‘winning not losing’). This is an example of single-loop learning.

Another possible approach might be to examine and change the governing values themselves. For example, the manager might choose to critically examine the governing value of ‘suppressing negativity and conflict,’ which may lead her to discard this value and substitute a new value such as ‘open inquiry.’

Describe the Ladder of Inference and how it can lead us to ‘short-circuit’ reality.

Human beings want to make sense out of the world, and we do this by observing and then making inferences as to what is valid and what is not. In doing so, we proceed through a ‘Ladder of Inferences’: the first step is to observe the real data and experience – taking in the sort of information that would be captured by a movie camera that can’t lie. From this we choose a set of selected data and experience that we will pay attention to; to this, we affix meaning, develop assumptions, and come to conclusions. Finally, we develop beliefs, which form the basis of our actions, which create additional real data and experience, completing the circle. This cycle is reinforcing, with each action building on the one before it. The problem is that our beliefs influence the selected data and experience that we decide to pay attention to, which essentially established an internal reinforcing loop that can ‘short circuit’ reality.

The tendency is to select data to pay attention to that supports our beliefs. As our beliefs become more and more rigid, the data and experience we are willing to pay attention to will become a smaller and smaller portion of reality. By developing an understanding of other people’s ladders of inference, we can start to see inconsistencies between the real data and experience and the selected data and experience resulting from their beliefs.

The ladder of inference becomes useful in helping people recognize when both they and others have jumped through several ‘inferential steps’ to draw a conclusion. When people disagree about a conclusion, what they need to do to make progress is make explicit the data they have selected and the steps in their interpretation process.

How do you define psychological success?

Psychological success means that a person has set a level of aspiration that is always challenging, but attainable. It is never set below being challenged – but at the same time, it is never so high that the person will never reach it. You define your level of aspiration in a way that’s always challenging and you accept personal responsibility for your behaviour. In Roger [Martin]’s new book [The Opposable Mind: How Successful Leaders Win Through Integrative Thinking], he shows how successful leaders are willing to accept personal responsibility, and are also willing to explore and learn. Much of the behaviour he describes in the book is consistent with Model II, and when it is not, the leader owns up to it. Successful leaders also know that there are times when Model I is the right approach to use. They don’t make try to make Model II an ideology, but it is a critical part of their skill set.

What are the first steps for a manager who wants to tackle these issues in their organization?

The key to changing behaviour is not simply changing behaviour, because it is possible to keep the same theory in your head and change your behaviour. The key is to change the way people reason about their behaviour, based on the theories in their heads. The challenge is to help individuals transform their espoused theories into theories-in-use by learning a new set of skills and a new set of governing values. Because many individuals espouse Model II values and skills, these traits are not totally new to them; however, the empirical fact to date is that very few individuals routinely act on their espoused values and skills. The criterion for success should be changes in defensive reasoning patterns and the theories-in-use that produce organizational defensive routines.

People can be taught how to recognize the reasoning they use when they design and implement their actions. They can begin to identify the inconsistencies between their espoused and actual theories of action; they can face up to the fact that they unconsciously design and implement actions that they do not intend; and they can learn how to identify what individuals and groups do to create organizational defenses and how they contribute to problems. Change has to start at the top, because otherwise defensive senior managers are likely to disown any transformation in reasoning patterns coming from below.

In the end, the essence of life is what? Understanding? No: it is understanding in order to take action. R

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Possibility Thinking

Lessons from Breakthrough Engineering

By Jeanne Liedtka and Robert Friedel

Engineers have long viewed design as a core activity. Managers would be wise to turn to them for creative inspiration.

Business strategists tend to be well-versed in the identification and analysis of constraints. But what of possibilities? If the ability to see new possibilities is fundamental to creating innovative designs—whether of products, cities, or business strategies—what do we know about state-of-the-art possibility thinking?

Not much, it seems. Business strategy has historically been seen as a largely analytic endeavor, with relatively little attention paid to the creative aspects of strategy formulation. In this article, we will describe eight ways to illuminate new possibilities taken from Engineering success stories and discuss what each might look like if applied to business strategy.

1. Challenge Assumptions
Challenging assumptions and defying convention are often the first steps in creative Engineering. To produce something original, an engineer raises questions about the way things are done and entertains doubts about what is assumed to be necessary, natural, or customary.
For example, ‘seismic base isolation’ is a system of protecting buildings from earthquake damage by using bearings or supports, typically made of layered rubber and steel pads, to separate buildings from the ground on which they sit. The bearings allow a building to move freely on shaking ground. This approach challenges the customary view that we make a building stable by fixing it firmly to the earth. In describing the traditional method of limiting earthquake damage in The Seismic Design Handbook, Ronald Mayes wrote, “The basic approach has not changed [over the years]: construct a very strong building and attach it securely to the ground. This approach of arm wrestling with nature is neither clever nor subtle.” The new technology breaks from this radically by allowing a building to move, but to move without destruction. Putting ‘bearings’ underneath a building’s foundations separates the building itself from a potentially moving earth. One ambitious application has been the work of Eric Elsesser and his associates in retrofitting the San Francisco City Hall following the Loma Prieta earthquake of 1989. This building is now separated from the earth by hundreds of steel and rubber isolation bearings, making it the largest base-isolated structure in the world.

In the realm of business strategy, we see much the same process at work when managers challenge mental models and industry assumptions. New possibilities emerge when they refuse to accept existing paradigms and constraints. The potential opportunities revealed when managers look through a different lens can be enormous. Consider the incremental value created at Raytheon with the development of the new Vigilant Eagle anti-terrorism device, designed to protect commercial airliners from over-the-shoulder missiles. Conventional wisdom decreed that each plane be outfitted with its own protection device at a cost of approximately one million dollars per plane. With estimates for protecting all U.S. commercial aircraft of $20 billion, creative managers at Raytheon hit upon a new possibility – that of protecting airports, rather than individual planes. They estimate that 70 per cent of U.S. air traffic can be protected for less than $2 billion. Challenging existing approaches became the path to a cost-effective solution.

2. Make Connections

Making connections between seemingly unrelated ideas is also often at the heart of creative Engineering. Novelty can result from going outside of a single field or discipline and bringing together diverse concepts, tools, capabilities, and ways of thinking. ‘Tissue Engineering’ is a new specialty that creates usable human tissues for repairing or replacing damaged ones. Engineers have tackled this problem by relating medical and biological approaches to those of chemical engineers, materials scientists and engineers, and mechanical and electrical engineers. Some of the basic approaches of tissue engineers borrow from Civil Engineering: ‘scaffolds,’ for example, provide biodegradable structures on which tissue cells can grow. Another key device used by some tissue engineers is the ‘bioreactor,’ a vessel especially designed for the cultivation of living tissue. Tissue Engineering is now emerging from the laboratory into medical applications and producing experimental products including skin, cartilage, and liver tissues.

Connecting can be equally powerful in the business environment. The use of analogies that connect different fields can provide a window of insight into new possibilities for value creation. While adhering to the mental models of one’s own industry is limiting, trying on the mental models of another can surface intriguing new opportunities. The story of Ethel M. Candies demonstrates the power of connecting across business boundaries. John Haugh, Ethel’s new president, faced the daunting challenge of growing the business in a confectionary market suffering from slow growth and consumers who preferred Godiva – despite Ethel’s superior quality in blind taste tests. Rather than continue to pursue the existing packaged-goods strategy, John combined his own career experiences in retail with close observation of the success of Starbucks. If Starbucks could do it with coffee, why couldn’t Ethel create a similar experience around chocolate? Thus was born Ethel’s Chocolate Lounge.

3. Visualize

For an engineer, making something new often means first thinking about how it might look – picturing it in the mind’s eye. Engaging the senses beyond what words describe sometimes opens new paths to creativity. Visual thinking is a key element in many kinds of Engineering, particularly those dealing with large structures. In some projects, however, the visual element is particularly striking and the creative act appears to be tightly bound to thinking about problems pictorially. One recent example is the Gateshead Millennium Bridge, carrying foot traffic across the River Tyne between the cities of Newcastle and Gateshead in northern England. This remarkable structure was envisioned as a ‘blinking eye’: it opens to allow river traffic not by lifting up, but by pivoting. The movement of its supporting arch and its curved foot surface creates a remarkable sight, enhancing the visual aspect of the engineering both while stationary and while in motion.

Visualizing is perhaps the most challenging concept to transfer from the world of Engineering to the world of business strategy. After all, strategies represent ideas, not concrete objects: they are comprised of numbers and words – how can they be made visual? Yet there is significant value in pushing our thinking along this dimension. Designers, we are told, ‘think with their pencils’ – allowing the emerging visual images they sketch to deepen their understanding.
of what they are designing as it unfolds. If strategists think only with their spreadsheets, how much use of imagination can we expect?

Trader Publications, a producer of free classified product guides, has taken the dictum to use visuals to heart. As part of its strategic planning process, managers not only describe competitive publications, they obtain copies of them. These copies are aggregated at corporate, where managers array them in conference rooms for examination. This experience – the visual and visceral experience of handling these publications, according to Trader executives, produces far richer possibility discussions than reading reports about them. In a similar vein, organizations have begun to experiment with creating strategy maps – pictorial guides that use analogies to portray both their and competitors’ strategies. The act of creating these maps often triggers profoundly new insights.

4. Collaborate
Many Engineering innovations are the product of cooperative effort and could not be developed any other way. Groups bring together a range of talents and capabilities, applying them to generate results that reflect both individual skills and a collaborative creativity that is more than the sum of the separate endeavors.

A jet airliner is one of the most complicated products designed by modern engineers. It contains literally millions of individually-designed parts, which must work together to meet the highest standards of performance and safety. The Boeing Company’s 777 jet is a model of collaborative creativity on an extraordinary scale. The collaboration behind it, however, is interesting not simply for its scope but also for the pioneering communication methods it relied on. This was the first major aircraft designed using extensive computer networking – more than 2,200 work stations linked by eight mainframes – to bring together thousands of engineers working on every phase of the project at the same time. Although many never met in person, the computer system promoted a collaborative process so central to the project that the 777’s slogan was ‘Working Together.’ At the heart of the system was software developed by IBM and Dassault Systèmes, called CATIA (Computer-Aided Three-dimensional Interactive Application). Boeing extended this with EPIC (Electronic Pre-assembly In the Computer), allowing engineers in disparate locations to design and test ‘virtual’ prototypes of crucial components of the airplane.

Interestingly, in Boeing’s design of its newest product, the 787, the firm has pushed collaboration beyond groups of engineers to collaboration with customers as well, creating special Web portals that solicit their input on likes and dislikes to incorporate into the design process. These examples of collaboration with suppliers and customers represent just two of many ‘white space’ possibilities.

At United Technologies Corporation, collaboration between in-house technical talent at two separate divisions – jet engine designer Pratt & Whitney and cooling specialist Carrier – created the breakthrough Purecycle product with virtually no new components needed. Purecycle converts waste heat to electricity – an opportunity that went unrecognized until engineers who thought in terms of power met up with engineers skilled at using heat exchange to produce cold air. Crossing such functional and business unit boundaries can provide rich sources for enhanced value creation.

5. Harmonize
In every area of human effort, creativity is intimately associated with the quest for beauty. This is most obvious in the Fine Arts, but it is no less true in the practical arts like Architecture and Engineering. Here, especially, there is an aesthetic quality that often lies in harmony, in fitting the products of human ingenuity agreeably into their environment.

In Colorado’s Glenwood Canyon, a key link in the interstate highway system required the construction of a viaduct to carry the road over a narrow, curving stretch of the Colorado River. The Hanging Lake Viaduct fits aesthetically into this precious natural setting, while providing an efficient and reliable transportation link. Meeting this challenge involved not only designing a structure that would harmonize with its environment, but also minimize harm to the river and its surroundings. The builders used a giant gantry and crane to set the pre-cast concrete box girders into place from above. The number of piers supporting the road was reduced by producing spans as long as 300 feet. Bridge members were designed with straight lines to blend with the striations of the canyon walls.

In business strategy, we have a long history of paying attention
to the ‘fit’ of an organization’s strategy, both in terms of its internal consistency and in its appropriateness for its larger environment. Good strategies, we know, are aligned along many dimensions. We have an equally long history, however, of largely ignoring aesthetics – of treating them as trivial adornments to high-end products and services. In fact, it is somewhat difficult to even describe what the ‘aesthetic’ dimensions of a strategy might be.

What makes a strategy more than merely functional – a thing of beauty? The origin of the word ‘aesthetic’ lies with the Greek term aisthetikos, meaning ‘of sense perception.’ Thus, we might conjecture that it relates to strategies that appeal to the senses, rather than merely to cognition – new possibilities that have an emotional appeal, a ‘presence’ that commands attention and invites engagement. Yet consider how banal and clichéd some corporate missions are; no wonder they fail to command attention, much less emotion. Then consider instead the emotional engagement The Body Shop evoked when it committed to natural products and lack of animal testing coupled with a recycling ethic. These simple aesthetics created a unique and compelling value proposition for targeted customers who shared their values. Change, psychologists tell us, is primarily driven by desire – it is in that sense of the term ‘aesthetic’ that we can learn from designers how to make business strategies more compelling and new possibilities more evident.

6. Improvise

Outer space exploration is one of the last places we would expect engineers to improvise. Few activities appear to be so thoroughly planned from start to finish: whether executing repairs on a device millions of miles away or devising ways to extend the work of multimillion dollar instruments, the spacecraft engineer may work with the most extreme constraints of all. The Voyager 2 space probe was launched in August 1977, primarily as a back-up for the Voyager 1 flight to Jupiter and Saturn. Designed to operate for five years, it ended up carrying out important missions for more than 12 and is still sending data back to earth. Voyager 2 has been constantly re-engineered, repaired, reprogrammed, and reconfigured by earth-bound engineers working with the constraints of a device which receives its communications in a dead language minutes after the commands are sent.

In the business context, limitations to action are often seen as ‘stop signs’ – signals to give up the quest for an innovative solution. For designers, the response is the opposite: constraints act as triggers to seeing new possibilities. Some of the most successful business strategies were not the result of careful forethought; instead, they were the products of improvisation, created out of necessity when familiar options were unavailable. IKEA offers a case in point. Nearly every element of its now famously-harmonized strategy – furniture packed flat in pieces, customer home assembly, and self-service in their warehouses – was a clever response to an unanticipated problem. Customer self-service, for instance, originated with the opening of the Stockholm store, which was so unexpectedly popular (and hence understaffed) that frustrated customers grew tired of waiting for scarce warehouse personnel to bring their purchases to them, and went in search of them themselves. What distinguishes IKEA is not that such problems developed, but that it was able to observe new possibilities inherent in them, and to build these serendipitous discoveries into its strategy.

7. Reformulate

New possibilities can emerge from new formulations of problems rather than new solutions. When people change goals or revise notions of what is important and what isn’t, different priorities and approaches may be more appropriate.

Engineers’ goals and priorities may shift for a variety of reasons. Changes in fashions, markets, or politics may make approaches that were once considered desirable or necessary seem inappropriate. Or, engineers and society at large may learn new things that lead to a re-evaluation of results and a reorientation of efforts. Few better examples can be found than the re-engineering of South Florida’s rivers and wetlands. The Kissimmee River begins near Orlando and flows southward for about 100 miles. Historically, it meandered through a one-to two-mile wide flood plain, covering all but a small portion of the land for most of the growing season. In periods of large storms or hurricanes, waters from the Kissimmee and other rivers would destroy homes and crops over a wide area. To reduce flooding, the U.S. Army Corps of Engineers straightened the river in the 1960s, and drained much of the nearby wetlands.

However, even before the project was completed in 1971, it was clear that this effort had resulted in devastation of wildlife habitats and the displacement of many animal and plant species. State and federal agencies decided that engineers’ efforts needed to be reoriented toward undoing the damage: recovery of the River became one of the most ambitious restoration projects ever undertaken. Slowly the Corps of Engineers and the South Florida Water Management District are returning major portions of the Kissimmee from a canal back into a meandering river, to make the environment once again hospitable to its historic inhabitants.

Re-examining the definition of a problem holds great potential for generating new possibilities in the business realm. One of our favourite stories is that of P&G’s creation of the Swiffer mop. After decades of focusing on the problem of ‘producing more effective detergents,’ P&G re-oriented its thinking to focus on ‘creating a cleaner floor,’ as well. This led to the realization that detergent was only part of the solution, and that significant opportunities existed.
in producing a better mop. A similar shift occurs, at a generic level, whenever business strategists move from focusing on the problem of ‘How do we sell more of product X?’ to ‘What need is the customer trying to satisfy?’

8. Play
To an extent that is often unrecognized, play is a key element of the creative act. Perhaps the best example is the design firm IDEO, which stocks each of the firm’s offices with an identical ‘tech box.’ As the firm’s Web site describes it, “Each tech box has several drawers holding hundreds of objects, from smart fabrics to elegant mechanisms to clever toys, each of which are tagged and numbered. Designers and engineers can rummage through the compartments, play with the items, and apply materials to their current project.” Computer and database linkages allow sharing of tech box play among the firm’s offices, and each box has a ‘curator’ who constantly updates the contents.

The idea of play may appear ill-suited to the business environment, but the single-minded pursuit of efficiency and optimization can lead to ‘analysis paralysis’ and leave little room for the emergence of new possibilities. To play is to try to do something, not merely to think about it. Play does us the great service of calling attention to the value of the experiment, the willingness to forfeit certainty in the name of learning. Organizations good at finding new possibilities are quick to conduct low-cost experiments rather than detailed market feasibility studies. For example, consumer products companies are increasingly likely to talk their key retailers into just a small amount of shelf space in a few stores to test new ideas, preferring to fail early and on small volume rather than do major roll-outs based on predictions of consumer behaviour that may prove incorrect. This kind of ‘serious play’ is likely to pay big dividends in opening up new possibilities.

In closing
We suggest that business strategists begin by asking themselves a simple set of questions that draw on the approaches described here and provide a warm-up for the possibility-thinking muscles of our strategic brains:

1. Take an absolute industry ‘truth’ and turn it on its head. Ask “what if anything were possible?” and look at the new opportunities that appear.
2. Look outside the boundaries of your usual world. Ask, “what if we were operating in an industry quite different than ours – what would we be doing instead?”
3. Put the numbers aside and get some images down on paper. Try using a napkin. What emerges?
4. Find a partner and go forth and co-create. Ask, “what can we do together that neither of us can do alone?”
5. Push yourself beyond the ‘workable.’ Try to get to ‘intriguing.’ Ask, “What is really worth doing – what can I get excited about?”
6. Act as if necessity truly was the mother of invention and make surprises work for you instead of against you. How can you turn an unexpected development into an asset?
7. Try on a different definition of the problem. Step away from your product and ask, “what is the problem my customers are really anxious to solve?”
8. Go out and conduct low-cost experiments instead of forming a committee. What can you do today to move a new possibility forward?

As we look across the approaches for surfacing new possibilities outlined here, their applicability to business strategy is clear. Engineers have long viewed design as a core activity. As managers – particularly strategists – come to share this view, we would be wise to turn to them for creative inspiration. R

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A longer version of this article appeared in the Journal of Business Strategy’s recent special issue on design and business, which was guest-edited by Jeanne Liedtka and Dean Roger Martin.
Understanding the Subtext of Business Performance

by Teresa Amabile and Steven Kramer
Your behaviour as a manager dramatically shapes your employees’ ‘inner work life.’ But the key levers in your hands for **driving motivation and performance** may not be the ones you’d suspect.

**If**

**YOUR ORGANIZATION DEMANDS** knowledge work from its people, then you undoubtedly appreciate the importance of sheer brainpower. You probably recruit high-intellect people and ensure they have access to good information. You likely also respect the power of incentives and use formal compensation systems to appropriately channel that intellectual energy. But you might be overlooking another crucial driver of a knowledge worker’s performance: their inner work life.

People experience a constant stream of emotions, perceptions, and motivations as they react to and make sense of the events of the workday. As we arrive at our workplaces, we don’t check our hearts and minds at the door. Unfortunately, because inner work life is seldom openly expressed in modern organizations, it’s all too easy for managers to pretend that private thoughts and feelings don’t matter.

Our research addresses how these dynamics affect work performance. To examine this question, we constructed a research project that would give us a window into the inner work lives of a broad population of knowledge workers. Specifically, we recruited 238 professionals from 26 project teams and had them complete daily diary entries, in a standard format, for the duration of their projects. Nearly 12,000 diary entries later, we have discovered the dynamics of inner work life and the significant effect it can have on the performance of your people—and, by implication, your entire organization.

**More Than Meets the Eye**

Think about your own most recent day at the office, and try to recall it in some detail. What would hidden observers have been able to learn had they been watching you go through that day? They might have read e-mails you composed, reviewed reports you prepared, noted your interactions with colleagues, subordinates, and superiors and listened in on a presentation you delivered. They would have heard your end of various telephone conversations with customers, suppliers or consultants. Maybe they would have watched you sitting quietly for a while, looking off into space, jotting down a few notes.

But would these observers really understand your inner work life that day? Of course not. In having those conversations and writing those reports, you were not only dealing with the task at hand. As events unfolded, you were also forming and adjusting perceptions about the people you work with, the organization you are part of, the work you do, and even yourself. You were experiencing emotions: maybe mild states of satisfaction or irritation, maybe intense feelings of pride or frustration. And these perceptions and emotions were intertwining to affect your work motivation from moment to moment—with consequences for your performance that day.

This is what we mean by inner work life: the dynamic interplay among personal **perceptions**, ranging from immediate impressions to more fully developed theories about what is happening and what it means; **emotions**, whether sharply defined reactions (such as elation over a particular success or anger over a particular obstacle) or more general feeling states, like good and bad moods; and **motivation**—your grasp of what needs to be done and your drive to do it at any given moment. Inner work life is crucial to a person’s experience of the workday, but for the most part is imperceptible to others; indeed, it goes largely unexamined even by the individual experiencing it.

In order to study inner work lives, we needed a level of access beyond that of an observer. Thus, we relied on the classic form of the personal diary. Every day, we sent a standard e-mail to every participant requesting a brief description—for our eyes only—of an event that stood out in his or her mind from that workday. Their remarks tended to make clear what they thought of the event—what it said to them about their work, their team, their organization, or themselves—and how it made them feel. Beyond that, we had participants rate themselves and each of their teammates monthly along various dimensions: creativity, work quality, commitment, and contributions to team cohesiveness. Because whole teams participated in the study, we were able to compare responses from colleagues, strengthening our understanding of notable events and their effects. Finally, rather than relying solely on a team’s diaries to assess its overall performance, we also included evaluations by knowledgeable people outside the team.

We were immediately rewarded with evidence of the richness and intensity of people’s inner work lives and the proof that they were influenced strongly by the events of the day. What also emerged over time was evidence of the interplay among perceptions, emotions, and motivations: an ‘inner work life system.’

This discovery fits well with what is already known about the human brain. Research in Neuroscience has found that emotion and cognition are tightly intertwined. Areas of the brain associated with rational thought and decision making have direct connections to areas associated with feelings. They do not exist in separate psychological compartments, and they interact in complex ways. Like any system, the brain cannot be understood simply by looking at each individual component. Inner work life functions the same way: it is crucial to consider all components and their interactions.
When something happens at work, it immediately triggers cognitive, emotional, and motivational processes. People’s minds start ‘sense-making’: they try to figure out why the event happened and what its implications are. These perceptions feed the emotions evoked by the event, and the emotions, in turn, feed the perceptions. Depending on what happens with these cognitive and emotional processes, motivation can shift, which, in turn, affects how people perform their work.

Consider how the dynamics played out with Infomap, a nine-person team of information technologists at DataBrook, a subsidiary of DreamSuite Hotels, that we tracked through various projects across a five-month period (note: we have disguised all names and other identifying information about individuals and their company.) One project, dubbed the ‘BigDeal’ project, came up suddenly in the fourth month of our study and had enormous financial implications. DreamSuite was being sued for more than $145 million, and its legal department required a great deal of analysis of financial records in order to defend the company. Infomap had eight days to complete the work.

The project had significant effects on the inner work lives of the team members. What first becomes clear in studying the diary entries is that people’s ‘events of the day’ caused them to form perceptions. Clark’s entry for May 26, for example, describes the start of the project and the activity surrounding it. Clearly he is engaging in sensemaking, and he comes away with positive perceptions of the “extreme importance” of the work done in his office, the “problem-solving capability” of his team, and the “supportive” nature of management. We saw the same kind of reflection by Chester as the project wound up on May 31. His sensemaking produced positive perceptions of the team’s co-leader (Ellen), the team itself, other groups in the organization, and top management. These perceptions were triggered by specific events – for example, the extraordinary efforts of Ellen, who rolled up her sleeves and worked alongside the team.

We also saw the impact of daily events on people’s emotions. Marsha reacted to an example of outstanding teamwork with great pleasure. The work atmosphere on May 31 was “happy and light,” she notes – even though they were working on Memorial Day, which should have been a holiday for everyone. There is evidence, too, of interplay between perceptions and emotions. When a high-level executive delivers bottled water and pizza to the people working after hours, not only does the event cause happy surprise,
it also sends a real signal to the workers. That seemingly trivial event caused people on the BigDeal project to perceive their work and themselves as important and valued, which evoked additional positive emotions. Similar emotions arose when other colleagues and teams offered to pitch in, reinforcing the positive perceptions that team members had formed of those people – and leading, over time, to even more positive emotions.

High levels of motivation were also on display in the BigDeal project diaries. The entry by Marsha on May 27, for example, reveals that she has just worked 15 hours straight. Yet she describes what she’s just endured as “one of the best days I’ve had in months!!” She then notes that “our entire office worked like a real team.” Her previous diary entries allowed us to understand how her motivation on May 27 resulted from positive emotions and perceptions. We found, in those entries, that she often felt elated when the team worked closely together, and she perceived herself and her work as more valued when others in the organization signaled its importance.

These effects of emotion and perception on motivation make perfect sense: if people are sad or angry about their work, they won’t care about doing it well; if they are happy and excited about it, they will leap to the task and put great effort behind it. The same goes for perception: if people perceive the work, and themselves, as having high value, their motivation will be high. Just as important, if they perceive a clear path forward, with little ambiguity about what will constitute progress, motivation levels rise.

**What Gets Done When People Have Good Days?**

There is a long-standing debate among management scholars on the question of how performance is influenced by people’s subjective experiences at work: one side says that people perform better when they are happier and internally motivated by love of the work; others assert that people do their best work under pressure and when externally motivated by deadlines and competition with peers. There is research evidence to support each of these positions.

Having taken a microscope to this question, we believe strongly that performance is linked to inner work life and that the link is a positive one. People perform better when their workday experiences include more positive emotions, stronger intrinsic motivation (passion for the work), and more favourable perceptions of their work, their team, their leaders, and their organization. Moreover, these effects cannot be explained by people’s different personalities or backgrounds – which we did account for in our analyses. Put simply, every moment that they are performing their jobs, employees are “working under the influence” of their inner work lives.

So what do we mean by performance as it relates specifically to knowledge work? In settings where people must work collaboratively to solve vexing problems, high performance depends on four elements:

1. Creativity
2. Productivity
3. Commitment, and
4. Collegiality

We looked at each of these elements and mapped them against the three components of inner work life. First, we traced the influence of positive emotion on people’s creativity – that is, their ability to come up with novel and useful ideas. Many previous studies, conducted as carefully-controlled laboratory experiments, have demonstrated a causal relationship between emotion – also termed ‘affect’ or ‘mood’ – and creativity. Our study, which used a more naturalistic approach to measuring the effect of emotion on creativity, confirms that this is not merely a laboratory phenomenon. Positive emotion was tied to higher creativity, and negative emotion was tied to lower creativity. Across all 26 teams, people were over 50 per cent more likely to have creative ideas on the days they reported the most positive moods than they were on other days. This finding is based not on people’s self-ratings of creativity but on evidence in the diary that they actually did creative thinking that day.

There was even a surprising carry-over effect: the more positive a person’s mood on a given day, the more creative thinking he or she did the next day – and, to some extent, the day after that – even taking into account the person’s mood on those later days. This was clearly the experience of Marsha of the Infomap team: of her 68 diary entries, 20 contain evidence of creative thinking. Fully 80 per cent of those creative-thinking days followed days on which Marsha’s general mood was higher than average for her. Her negative emotions on the days preceding creative-thinking days were the mirror image: her anger was below average on 75 per cent of the preceding days, her fear was below average on 65 per cent, and her sadness was below average on 60 per cent of them.
Second, we looked at how people’s perception of their work context affected creativity. People in our study were more creative when they interpreted the goings-on in their organizations in a positive light – that is, when they saw their organizations and leaders as collaborative, open to new ideas, clearly focused on an innovative vision, and willing to reward creative work. They were less creative when they perceived political infighting and internal competition or an aversion to new ideas or to risk taking.

Finally, we analyzed the impact of motivation, the third aspect of inner work life, on creativity. Over the past 30 years, we have garnered a great deal of research evidence supporting what we call the ‘intrinsic motivation principle’ of creativity: people are more creative when they are motivated primarily by the interest, enjoyment, and challenge of the work itself – not by external pressures or rewards. When intrinsic motivation is lowered, creativity dips as well. Our diary data add to the evidence. Our study participants were more creative in their individual work on the days when they were more highly intrinsically motivated. What’s more, the projects distinguished by the greatest levels of creativity overall were the ones in which team members displayed the highest intrinsic motivation in their day-to-day work.

Our findings were similar when we shifted our focus from creativity to the other elements of performance: productivity, commitment to the work, and collegiality (i.e. contributions to team cohesiveness). People performed better on all these fronts when they were in a good mood and worse when they were in a bad mood. Productivity, commitment, and collegiality also increased when people held positive perceptions about their work context. At a ‘local’ level, this meant perceiving that they were supported by their team leaders and colleagues, creatively challenged by their tasks, trusted to make decisions with reasonable autonomy, and given sufficient resources and time to complete assignments. More broadly, it meant they perceived the organizational context as collaborative and open, not rife with political game playing or crippling conservatism. Finally, intrinsic motivation levels predicted performance levels across the board. People were more productive, committed, and collegial when they were more motivated – especially by the satisfactions of the work itself.

What Good Managers Do
When we ask people in business to guess which events caused by managers have the greatest influence on inner work life, they often think of interpersonal events – the kinds of encounters where, for example, the manager praises a subordinate, works collaboratively with a subordinate, or makes things more fun and relaxing. Or the opposite. These sorts of events do, indeed, have a real impact on people’s perceptions, emotions, and motivations. But, interestingly, our research shows that the most important managerial behaviours don’t involve giving people pats on the back or attempting to inject lighthearted fun into the workplace. Rather, they involve two fundamental things: enabling people to move forward in their work and treating them decently as human beings.

Enable progress. When we compared our study participants’ best days (when they were most happy, had the most positive perceptions of the workplace, and were most intrinsically motivated) with their worst days, we found that the single most-important differentiator was a sense of being able to make progress in their work. Achieving a goal, accomplishing a task, or solving a problem often evoked great pleasure and sometimes elation. Even making good progress toward such goals could elicit the same reactions.

It was clear from the diary data that being able to make progress in one’s work is a very big deal for inner work life. The next question, then, is which managerial behaviours affect employees’ ability to do so? Our research points to several: for example, providing direct help (versus hindrance), providing adequate resources and time (versus inadequate resources or unnecessary time pressure), and reacting to successes and failures with a learning orientation (versus a purely evaluative orientation). But one of the most important managerial behaviours turns out to be the setting of clear goals. People make more progress when managers clarify where the work is heading and why it matters. In our diary study, the teams that made greater progress had more events in which the project goals and the team members’ individual goals were clear and where people knew why their work mattered to the team, the organization, and the organization’s customers. By contrast, teams that made less progress reported more events that confused or haphazardly changed the goals. Sometimes those teams would be given a goal by management, only to be assigned several other tasks that conflicted with that goal. Often, those teams had a sense of futility about their work, because of uncertainty about how their efforts would make a difference.

Managerial events facilitating or impeding progress may be so
powerful because they have multiple direct and indirect effects on performance. The direct effects are fairly obvious. For example, when goals are not articulated clearly, work proceeds in wrong directions and performance suffers. Less directly, the frustration of spinning one’s wheels sours inner work life, leading to lower motivation; people facing seemingly random choices will be less inspired to act on any of them. People trying to make sense of why higher-ups would not do more to facilitate progress draw their own conclusions – perhaps that their work is unimportant or that their bosses are either willfully undermining them or hopelessly incompetent.

**Manage with a human touch.** None of this emphasis on the managerial behaviours that influence progress diminishes the importance of interpersonal managerial events in which people are (or are not) treated decently as human beings. Although such events weren’t quite as important in distinguishing the best days from the worst, they were a close second. We frequently observed ‘interpersonal events’ working in tandem with ‘progress events.’ Praise without real work progress, or at least solid efforts toward progress, had little positive impact on people’s inner work lives and could even arouse cynicism. On the other hand, good work progress without any recognition – or, worse, with criticism about trivial issues – could engender anger and sadness. Far and away, the best boosts to inner work life were episodes in which people knew they had done good work and managers appropriately recognized it.

**In closing**
Discovering how inner work life affects performance is clearly valuable. But we hope we have also made progress on another front: inner work lives matter deeply to the people living them. Studies show that knowledge workers, as compared to workers of past eras, spend more time in the office and more time focused on work issues while outside of the office. As the proportion of time claimed by work rises, inner work life becomes a bigger component of life itself.

People deserve happiness. They deserve dignity and respect. When we act on that realization, it is not only good for business: it affirms our value as human beings. 

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Design Thinking: On its Nature and Use
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THE HANDBIWORK OF HUMANKIND has finally begun to impress itself on the global environment and on us, its inhabitants. It is news to no one that current rates of resource consumption cannot keep up with population growth as it exists. By 2050, world population is virtually certain to increase by half again from its present 6.46 billion – with all that means for our dwindling resources. Coupled with that, it is now clear that global warming is fact, and its growing control over Earth’s climate and weather systems will unpredictably complicate problems already made serious by population pressures.

While the road ahead seems dark, there is hope: a profusion of new technologies is emerging, many with the potential to alleviate the problems induced by population growth. Key to the use or misuse of these technologies are the decision processes employed by those in power. History has shown that political decisions do not always favour the best interests of all, and when critical factors include information not easily understood by decision makers, that information may be disregarded or not even considered. The stakes are now too high for critical information to be unheard or ignored.

Science advisors have long been included among high-level governmental advisory staffs. How their advice is valued, however, has varied with the problem context, and political interests have almost always trumped scientific advice. More than ever before, scientific advice requires serious consideration.

Another kind of thinking deserves equal attention: design thinking is in many ways the obverse of scientific thinking. Whereas the scientist sifts facts to discover patterns and insights, the designer invents new patterns and concepts to address facts and possibilities. In a world with growing problems that desperately need understanding and insight, there is a great need for ideas that can blend that understanding and insight in creative new solutions.

Finders, Makers and Applied Creativity
A sensitive observer might notice an interesting thing about creative people: they tend to work in two different ways (see Figure 1). Those who work in the first way might best be called ‘finders.’ They exercise their creativity through discovery and are driven to find explanations for phenomena not well understood. In professional life, they usually become scientists or scholars and are responsible for much of our progress in understanding ourselves and our surroundings.

Those who work in the second way are ‘makers,’ and they are equally creative, but in a different way. They demonstrate their creativity through invention. Makers are driven to synthesize what they know in new constructions, arrangements, patterns, compositions and concepts that bring tangible, fresh expressions of what can be. They become architects, engineers, artists – designers – and are responsible for the built environment in which we live and work.

Given the fundamental process differences between how finders and makers think and work, it is reasonable to believe that other factors might similarly reveal differences among professional fields and, therefore, help to define the nature of design thinking.

One such factor is the content with which a field works. A conceptual map can be drawn to use both content and process factors (see Figure 2). Two axes define the map: separating it into left and right halves is an Analytic/Synthetic axis that classifies fields by process – the way they work. Fields on the left side of the axis are more concerned with ‘finding’ or discovering; fields on the right with ‘making’ and inventing. A Symbolic/Real axis divides the map into halves vertically, according to content or realm of activity. Fields in the upper half of the map are more concerned with the abstract, symbolic world and the institutions, policies and language tools that enable people to manipulate information, communicate and live together. Fields in the lower half are concerned with the real world and the artifacts and systems necessary for managing the physical environment.

A sampling of fields illustrates how the map differentiates between fields (see Figure 3). The five chosen are highly recognizable with well-defined disciplines and well-understood differences. Every field has component elements in each of the four quadrants. What distinguishes one field from another is the degree to which a

by Charles Owen

While it is less understood than scientific thinking, design thinking has characteristics of great value to teams dealing with complex, ill-formed problems.
field positions its 'centre of gravity' away from the centre into the quadrants, and the direction that positioning takes. In Figure 3, fields close to the centre are more 'generalized' with respect to the axes; fields away from the centre are more 'specialized.'

As a field that is heavily analytic in its use of process, Science is farthest to the left. Its content is also more symbolic than real in that subject matter is usually abstracted in its analyses. There are elements of Science, however, that are synthetic in process (as, for example, in Materials Science or Organic Chemistry), and it can deal directly with unabstrac ted, real content, particularly in the Natural Sciences.

Law, as a generalized field, is located higher on the map, concerned extensively with the symbolic content of institutions, policies and social relationships. It is also positioned more to the right, as a significant portion of its disciplines are concerned with the creation of laws and the instruments of social contract. Medicine, in contrast, is sharply lower on the content axis, vitally concerned with the real problems of human health. On the process scale, it is strongly analytic; diagnostic processes are a primary focus of medicine. Art is high on the content axis, strongly symbolic, and almost evenly divided on the process scale, still more synthetic than analytic, but very much involved with interpretation of the human condition.

Design in this mapping is highly synthetic and strongly concerned with real world subject matter. Because disciplines of design deal with communications and symbolism, it has a symbolic component, and because it requires analysis to perform synthesis, there is an analytic component – but Design is a field relatively specialized, and specialized nearly oppositely to Science.

Fields, of course, are just the tops of hierarchies, and the hierarchical nature of their subject matter opens a door to the examination of relationships among elements at finer levels of detail. For almost any field, a case can be made for movement to the left or right based on the variety of detailed interests the field subsumes, but absolute positioning is not what is important in this kind of mapping: relative positioning is. It provides a means for comparing multi-field relationships with regard to the two important dimensions of content and process.

Values and Measures
Science is driven by the need for understanding. To achieve this goal, it values correctness, in the sense that theories can be evaluated for whether they are correct, as best can be determined with current data. It also values thoroughness because understanding must be thorough to remove uncertainty. Testability is valued because closure demands that theories be tested and determined to be correct or incorrect. These values (and others) find expression in measures that expand the essence of the value into tools that can be incorporated directly or indirectly in frame-of good citizenship. Measures such as just/unjust, right/wrong, complete/incomplete, appropriate/inappropriate and fair/unfair draw out the evaluations appropriate to the field (see Figure 4).

Art, quite different in this kind of analysis, derives from the need for expression. Values such as insightfulness, novelty and stimulation highlight important aspects of expression as it is regarded today, and measures such as thought provoking/banal, fresh/stale and exciting/boring particularize these for the criteria to be used in the production and criticism of art.

Medicine shares much with Science, but has its own need for being in maintaining, promoting and regenerating health. Among its values, correctness is critical for diagnoses and procedures, and effectiveness, a value strongly shared with design, is relevant when something is better than nothing. Measures include correct/incorrect, works/doesn't work and better/worse.

Design exists because of the need for form. The form giver, in the broadest use of the term, creates order. Because the world of design is the world of the artificial, the values of design tend to be ones associated with human needs and environmental needs created by human actions. Cultural fit is associated with aesthetic issues; appropriateness targets the wide range of physiological, cognitive, social and cultural human factors; and effectiveness gauges functionality and utility. For cultural fit, good measures are fresh/stale, fits/doesn't fit and elegant/inelegant; for appropriateness, appropriate/inappropriate and works/doesn't work (from the human factors perspective) are helpful. From a utility perspective, works/doesn't work, sustainable/unsustainable and better/worse measure effectiveness.

Seen through the lens of their underlying values, differences among fields become clearer and more understandable. As a case in point, a major difference between Science and Design lies in the difference between 'correctness' and 'effectiveness' as important measures of success. Correct/incorrect (or true/false) is appropriate for a field in which there can only be one 'true' answer or correct explanation for an observed phenomenon. Better/worse is appropriate for a field in which multiple solutions can be equally successful because the conditions for judgment are culturally based.

From all this, it is easier to see why a combination of Science and Design thinking is better than either alone. While both are
valuable, together they bring the best of skeptical inquiry into balance with imaginative application. Because both are well served by creative thinking, we will now look at the general characteristics of the creative thinker.

**Characteristics of Creative Thinking**

Despite considerable speculation, the nature of creativity – what makes one person creative and another not – and the creative process itself remain elusive. Nevertheless, a number of characteristics have been identified that can be useful in contemplating the nature of creative thinking and, in particular, creative design thinking.

In a special issue of *Kaiser Aluminum News* some years ago, editor Don Fabun assembled characteristics of the creative individual culled from the observations of a number of thoughtful writers. While they are not all-inclusive, they provide a good start for assembling a catalogue:

- **Sensitivity**: a propensity for greater awareness which makes a person more readily attuned to the subtleties of various sensations and impressions.
- **Questioning attitude**: an inquisitiveness, probably imprinted in early home training that encourages seeking new and original answers.
- **Broad education**: an approach to learning instilled from a liberal education that puts a premium on questions rather than answers and rewards curiosity rather than rote learning and conformity.
- **Asymmetrical thinking**: the ability to find an original kind of order in disorder as opposed to symmetrical thinking that balances everything out in some logical way.
- **Personal courage**: a disregard for failure derived from a concern, not for what others think, but what one thinks of oneself.
- **Sustained curiosity**: a capacity for childlike wonder carried into adult life that generates a style of endless questioning, even of the most personally cherished ideas.

**Time control**: instead of being bound by time and schedules, creative individuals use time as a resource – morning, noon and night – years, decades – whatever it takes, unbound by the clock.

**Dedication**: the unswerving desire to do something, whatever it may be and whatever the obstacles to doing it.

**Willingness to work**: the willingness to continue to pursue a project endlessly, in working hours and so-called free hours, over whatever time might be required.

In 1976, psychiatrist Silvano Arieti thoroughly reviewed what was then known about creativity. From his study, several additional characteristics can be included:

- **Fluency of thinking**: word fluency – the ability to produce words containing specified letters or combinations of letters; associative fluency – the ability to produce synonyms for given words; expressional fluency – the ability to juxtapose words to meet the requirements of sentence structure; and ideational fluency – the ability to produce ideas to fulfill certain requirements.
- **Flexibility**: the ability to abandon old ways of thinking and initiate different directions.
- **Originality**: the ability to produce uncommon responses and unconventional associations.
- **Redefinition**: the ability to reorganize what we know or see in new ways.
- **Elaboration**: the capacity to use two or more abilities for the construction of a more complex object.
- **Tolerance for ambiguity**: the capacity to entertain conflicting concepts for periods of time without the need to resolve uncertainties.

Mihaly Csikszentmihalyi, a renowned psychologist and anthropologist at the University of Chicago, sees the creative individual in terms of ‘pairs of apparently antithetical traits that are often both present in such individuals and integrated with each other in a dialectical tension’.
Csikszentmihalyi notes that these conflicting traits are difficult to find in the same person, but “the novelty that survives to change a domain is usually the work of someone who can operate at both ends of these polarities – and that is the kind of person we call creative.”

Many of the above characteristics are not qualities to be taught: at best, they are natural personality traits that can be recognized where they exist or noted in their absence; but many can be developed or encouraged.

**Characteristics of Design Thinking**

Creativity is of major importance to design thinking, as it is to science thinking and thinking in any field. But as is true for each field, characteristics other than creativity are also important. I would nominate the following as key aspects of design thinking:

1. **Conditioned inventiveness:** creative thinking for designers is directed toward inventing. Designers tend to be more interested in the ‘what’ questions than the ‘whys’ of interest to the scientist. Design creativity thus complements scientific creativity, but it brings to invention a concern that what is produced not only be inventive, but be so within the frameworks of human-centred and environment-centred measures governing the designer’s efforts.

2. **Human-centred focus:** Science and, to a slightly lesser extent, Technology have few built-in governors. That is to say, as in the Arts, exploration proceeds where discoveries direct. Design, on the other hand, is client-directed. Design thinking must continually consider how what is being created will respond to clients’ needs.
It is easy to see why a combination of science thinking and design thinking is better than either alone: together they bring the best of skeptical inquiry into balance with imaginative application.

3. Environment-centred concern: in recent years, design thinking has acquired a second, omnipresent client: the environment. Present-day thinking puts environmental interests at a level with human interests as primary constraints on the design process. Sustainable design is one very noticeable result. The ultimate value of human-and environment-centredness is a guarantee that the best interests of humankind and environment will be considered in any project.

4. Bias for adaptivity: in recent years, the emergence of adaptive processes in manufacturing and information technologies has greatly reinforced a practice historically followed by some designers: the design of adaptive products able to fit their users’ needs uniquely. Design thinking today has accepted that concept, approaching problems with the view that, where possible, solutions should be adaptive – in production, to fit the needs of users uniquely, and throughout their use, to fit users’ evolving needs.

5. Predisposition toward multifunctionality: solutions to problems need not be ‘monofunctional.’ Designers routinely look for multiple dividends from solutions to problems, keeping the big picture in mind while focusing on specifics.

6. Systemic Vision: design thinking is holistic, treating problems as system problems with opportunities for systemic solutions involving mixes of hardware, software, procedures, policies, organizational concepts and whatever else is necessary to create a holistic solution.

7. View of the Generalist: common wisdom holds that success will come more readily to those who choose to specialize early and plan their training accordingly. Design thinking, to the contrary, is highly generalist in preparation and execution. In a world of specialists, there is a real need for those who can reach across disciplines to communicate and bring diverse experts together in a coordinated effort. For inventive creativity, the wider the reach of the knowledge base, the more likely the creative inspiration.

8. Ability to use language as a tool: language is usually thought of as means for communication, but for designers it is also a tool. Visual language is used diagrammatically to abstract concepts, reveal and explain patterns, and simplify complex phenomena to their fundamental essences. Mathematical language is used to explore ‘what if’ questions where feasibility may be established by approximation – by calculations not exact, but close enough to support an idea. Verbal language is used in description where explanation goes hand in hand with the creative process, forcing invention where detail is lacking and expressing relationships that are not obvious visually.

9. Facility for avoiding the necessity of choice: the job of the decision maker is to choose among alternative proposals – usually the products of different problem-solving approaches. Design thinking takes the view that making that choice is a last resort: before moving to choice-making, the designer looks for ways to ‘have your cake and eat it too.’ The optimistic designer, however, searches the competing alternatives for their essential characteristics and finds ways to reformulate them into a new configuration. When this process is successful, the result is a solution that combines the best of both possible choices.

10. Self-governing practicality: in very few fields is there the freedom to dream that is expected in design. The best design thinkers understand this and learn to govern ‘flights of fantasy’ with a latent sense of the practical: the flight is to the outer reaches of what can be conceived; the tether is to ways that the conceivable might be realized. This is embedded in a style of thinking that explores freely in the foreground, while maintaining in the background a realistic appraisal of costs that can be met and functionality that can be effected.

In closing
Together, the characteristics of design and science thinking form a set of complementary thought processes able to add considerable strength to the advisory task. The ability to provide design thinking in an advisory capacity will require an evolution in design education and design research. For design education, new programs must be designed that bring the best of design thinking into the new context of policy planning. New content will be necessary; new processes must be developed and taught; and new ways of working will have to be learned.

It will be worth doing. R

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Integration: The Value of Managerial Thinking in an Age of Technical Reason

In an age where the digital machine can outperform the human mind at any task that can be represented as an algorithm, Integrative Thinking is the best revenge.

DOES THINKING MATTER TO SUCCESS IN BUSINESS? If so, in what ways? Consider the null hypothesis: ‘the way to success in business lies in hustle and luck – not necessarily in that order. A lucky, thoughtless hustler will outperform a sophisticated, disciplined thinking doer every time.’ If this is the case, the stories we delight in telling about how great business minds are causally implicated in the achievement of great business results are no more than made-up inspirational talk aimed at justifying a costly educational enterprise – which might far more efficiently devote itself to training hustlers and hope for good luck, or co-opting luck by training lots of hustlers and letting the chips fall where they may, than to training ‘thinking doers.’ Which is it?

Appeals to ‘evidence’ will not turn up easy answers. Most of empirical Psychology can tell us whether or not individuals obey certain rules assumed to be useful to the achievement of success in certain environments, although that assumption never really gets tested. And most anecdotal evidence tells us that people exhibiting certain traits have achieved certain results – without answering the
obvious question this begs: what happens to the successful individuals who do not exhibit these traits and the unsuccessful individuals who do exhibit them?

Disappointed by the hallways of empirical Science, the only alternative to despair is to build new models of the role of thinking in business – models that allow us to ask new and sharper questions which, just maybe, are answerable by empirical studies. One possible approach to building such new models is to think – to really think – about the position that thinking has in an age where the marginal cost of a calculation is $0.

It used to be the case that we would declare someone who could quickly and correctly multiply 12674 and 37993 as ‘smart’ and someone who could ‘only’ multiply numbers of fewer than four digits each as less smart. In the age of technical computing, these differences seem hardly worth mentioning. They certainly cannot be held up as paradigms of ‘managerial intelligence.’ And the fast computation of sums is just a barely significant beginning: the digital machine will outperform the human mind at any task that can be represented with the level of precision of an algorithm – that is, at any ‘algorithmic task.’ Moreover, if the marginal cost of the basic component of an algorithmic task – the operation – is $0, then, clearly, $0 is also a floor on the value that can be appropriated by a managerial mind that behaves in purely algorithmic ways.

This seemingly innocuous argument supplies a basic logic for the pursuit of connections between thinking and value creation: we must look away from purely algorithmic capabilities. OK, but, where should we turn our gaze? ‘Away from’ something is not exactly a valuable pointer to anything. What to do? When in doubt (and when empirical Science cannot help), we can follow the philosophers and do a thought experiment along the following lines: take a super-normally profitable production function – one that generates at least 50 per cent gross margins on revenues of more than $100MM, and start subtracting managers from it, out of various teams and at various knowledge-power levels within each team, and replace them with algorithms that are executed by computational devices, in order to determine the value added of the respective managers’ tasks and ways-of-being in executing those tasks. Once you have figured out the tasks that cannot be subcontracted to digital machines without losing the super-normal profit of the business, try to figure out if there is something that these tasks all have in common.

Let us attempt this exercise: first, focus on a super-normally profitable production function – like that of a large telecommunications equipment manufacturer; and focus, in addition, on a specific project that is part of this production function, such as the development of a next-generation cellular base station (i.e. the piece of network equipment that your Blackberry or cell phone talks to). Then, break up the task of designing and prototyping this monster into the specialized tasks required to complete the design, and identify the areas of specific and explicit expertise required to carry out these tasks (see Figure 1). These will include hardware, radio frequency (RF), software and network design, and analytical expertise of various kinds (market demand, financial reporting, financial value, competition). Each individual area of expertise can be characterized by more or less well-defined algorithms – or, analysis and decision procedures for producing outputs (market demand estimates, cost structures, block diagrams, etc.) from inputs (market data, input costs, system models). Each one of these algorithms can be executed by an ‘expert’ – of the type we would find in a cross-disciplinary product team in firms such as Nokia and Alcatel-Lucent – or, by a collection of low-skill workers employing some central coordination mechanisms (as we increasingly find in design projects that are outsourced and off-shored.)

Now, here is the important point: within each area of explicit expertise, tasks are more or less algorithmic in nature, and therefore those who carry them out are more or less easily replaceable by a computational device, because of the fact that each area is based on a specific discipline that supplies the equivalent of a ‘unified programming language’ (like C++ and MATLAB, only with more adjectives and adverbs than either one.) Knowledge of programming languages and environments and of operating systems, for instance, provide, jointly, a unified programming language for the execution of Software Engineering tasks. The most important feature of such a unified programming language is that it supplies not only a
common – and, commonly agreed upon – set of concepts and rules for resolving conflict, uncertainty and ambiguity, but also a set of ‘stopping rules’ that define solution criteria for problems within each area of expertise.

Simply put, the hardware designer ‘just knows when to stop’ working on a problem, and go from design work to testing or prototyping work. How does he know this – within some reasonable tolerance? He knows this because (see Figure 2) his expertise (hardware design) is embedded in a supporting set of disciplines (analog and digital circuit design and testing) that are themselves embedded in a supporting set of basic sciences (linear system theory, Boolean logic, statistical analysis of experimental results) whose main task is to supply a common and internally consistent set of patterns of representing and reasoning about the world, which, together, tell the expert in question how to regulate his thinking processes in a way that yields reliably ‘valid’ results. Of course, these basic sciences are themselves inhabited by individuals whose main task is to turn ‘reality’ into tractable mental objects and knowledge structures that support algorithmic reasoning of one kind or another.

So, where does this bit of cognitive Archaeology leave us, relative to our task? It leaves us in a rather informative place, in that we have identified in a precise way the parts of the super-normally profitable production function that builds cellular base stations that is algorithmic in nature – i.e. that admits of replacing experts with advanced computational devices, or, with lower-skilled workers coordinated by a central information sharing system. It also lets us make a good guess about the locus of ‘really valuable thinking’ in our map: it lies at the intersection of radically different areas of expertise – at the very centre of our map (see Figure 3).

Such ‘really valuable thinking’ is precisely what Roger Martin and I call Integrative Thinking – that part of thinking which cannot be captured by an algorithm because it has to do precisely with the successful integration of knowledge structures, mental models and patterns of reasoning and communicating that serve as the very foundations for radically different kinds of algorithms.

For example, you can find an algorithm for optimizing your inventory, given a set of cost and demand conditions; you can also find an algorithm for optimizing your design given a set of...
client-driven feature requests; but you cannot find an algorithm for optimizing both together, because the two algorithms are written in different languages, with different sets of optimization criteria and stopping rules. Accomplishing that entails integrating across domains of knowledge and experience that were not designed to ‘talk to each other’; so, the integrator at the centre of our map of the base-station production function has to re-design and re-engineer – in real-time – the basic interaction patterns that will enable the successful cross-domain synthesis required to deliver the super-normally profitable output of the business unit.

In particular, three types of Integrative Thinking stand out for the value they create:

1. **Substantive integration:** the integration of different specialized languages and mental models of the business. First, the integrator will be called upon to produce constructive resolutions of clashes among the different mental models that organize the perceptions, thoughts and actions of experts in the different functional areas. To the CFO or the controller, a development project will look like a series of discounted cash inflows and outflows with precise time-lines and penalties associated with risk, uncertainty, ambiguity around deliverables and timelines. To a development engineer, the same project will take on the representation of a potentially non-linear optimization problem, with constraints supplied by the target cost of goods sold and technological limits and objectives supplied by product feature sets. To the software engineer, the project will look like a large scale search problem, with the search space constrained by the syntactical properties of the programming language, the functional constraints of the operating system and the structural constraints of the hardware platform. Thinking integratively in this case relates to thinking that bridges between these different mental models of the task in a way that heeds the concerns and constraints of all of the specialized experts that are called upon for the successful execution of the design and development task, by building and legitimating new representations of the task that are agreeable to all of those whose contribution is needed for its success. This is not merely equivalent to the task of successfully translating the buzzwords and concepts of one area of expertise into those of
another, because in many cases the very criteria of what counts as a successful translation will vary from one discipline to another, and because each discipline is reductive in its own idiosyncratic way, there is no guarantee that experts from two or more disciplines will recognize a single translation as legitimate. Moreover, what counts as a valid problem statement and as a test of ‘valid knowledge’ will vary from one discipline to another: engineers may accept nothing but uniqueness or optimality proofs relying on deductive logic alone as ‘clinchers’ of difficult argument and valid members of solution sets for tough problems, whereas a marketing professional will often count stories, anecdotes and partial data as ‘evidence’ in arguments that rely on inductive and abductive logics to make their points. For this reason, the task of integration additionally involves bridging across disciplinary divides that relate to much more than differences in words, but, rather, cut through to differences in ways of formulating problem statements and solving problems.

2. Interactional integration: the integration of different modes of interacting and communicating. As if that is not difficult enough, the integrator’s task extends to a very different set of models, which require her to consider a large class of other ‘differences that make a difference.’ These are differences among different ways of interacting that members of different areas of expertise and disciplines bring with them as part and parcel of their professional identities. Teams, groups, divisions and organizations may be organized according to principles of authority (‘who’s the boss?’), fairness, or equity (‘is everyone getting his/her fair share of the payoffs or opportunities?’), efficiency (‘is everyone getting the most out of the task given their outside market opportunities?’) or welfare (‘is the entire group, team or organization better off as the result of each of the actions of all of its members?’) – which, collectively, supply different logics of interaction, which often remain implicit and shape dialogue and interactions ‘from the darkness of the barely conscious.’ Whereas financial professionals may
interact according to logics of efficiency or authority, scientific experts will bring along with them interactional logics based on maximizing the knowledge or expertise of the group as a whole (‘maximal welfare’) or alternatively, based on minimizing the perceived differences in payoffs to individual members of the group (equal opportunity). These interactional models – as specific to various teams and organizations as they are to different professional groups and sub-groups – will often shape expectations of different group members about the pragmatics of the activities (meetings, ‘design reviews,’ new product introduction processes, market requirements, document production) that constitute the very fabric of the overall production function of the organization, via such questions as: who gets to speak first, and why? What arguments are openly discussible and which must remain unstated – and, why? What is the role of organizational rank in discussions about technical merits – and why? The net result is that the integrator must formulate and solve a host of ‘wicked’ problems, so called because the criteria for what counts as a solution evolves along with the process of searching for that very solution.

3. Agency: the integration of seeing, feeling, thinking and action. Last but certainly not least, the high-value-added thinker provides a solution to what is perhaps the ultimate integrative problem: the problem of agency. The best way to get a feel for this problem is to ask yourself: why – given the great proclivity of the human intellect to commit fallacies of reasoning and perception vis-à-vis the ‘normative’ workings of a digital computation device – do we rely on human experts for problems that ‘cut really close to the flesh’ – such as medical, legal, managerial or financial ones? Why do we not sub-contract that thorny problem of making the right diagnosis that distinguishes between a benign atrial arrhythmia and a potentially fatal one to a large computational device that can really perform all of the correlations required for a statistically-relevant finding? Why trust to the so-called mind of a physician who depends so much on his own sleep patterns and a large host of other visceral factors for making the right call?

I am not excluding the possibility that this may be the way of the future, but, for now, it is clear that, when results really matter, agency – and the responsibility assignment that it entails – also really matters. The task of claiming and establishing agency is ultimately one that a digital device cannot perform and that the execution of no algorithm can safeguard. It is also a task that is critical to he who must stand outside of any disciplinary language, safeguard, or pillar in order to effectively integrate across multiple ways-of-being and knowing.

Our integrator must, then, function as an agent – as one that shoulders the responsibility of his or her own perceptions, feelings, thoughts and actions and thus foregoes an appeal to the therapeutic cocoon of any one set of professional ‘codes of conduct’ (‘I’m covered!’), interaction rules (‘I did the right thing, outcomes notwithstanding!’), or hierarchical rank (‘I was told to do it!’). The reason for this is simple enough to state: there is no single set of codes or rules or single hierarchical structure that the integrator can simply defer to – that is precisely why he is an integrator. He has no ‘air cover’ – to put the matter in military terms: ground work is where his job is at. And, to come to grips with it, he can draw inspiration from no less than the intellectual forefather of all integrative thinkers – Aristotle – who, besides positing that the faculty of reason is the queen of human faculties in virtue of being their integrator, also cautioned about the difficulties of establishing
An endeavor that is fraught with failures, which should tell you something about trying to ‘teach thinking’ in a vacuum. However, appropriating new ways of thinking by experiential immersion in new domains of expertise is not, which opens up a vast untapped, realm of pedagogical possibilities.

In closing
To sum up: there is, I posit, a particular kind of thinking that matters to success in business, but figuring out what it is and how to do more of it requires a new conceptualization of valuable thinking in terms of its integrative functions – the functions that produce successful integration across knowledge and interactional domains and confer agency upon decision makers.

Can these forms of thinking be taught? The answer is, ‘stay tuned’, but, here is a hint: transferring thinking skills across domains of experience (for instance, getting professional logicians to think logically about their own medical problems and their diagnoses) is an endeavor that is fraught with failures, which should tell you something about trying to ‘teach thinking’ in a vacuum. However, appropriating new ways of thinking by experiential immersion in new domains of expertise is not, which opens up a vast untapped, realm of pedagogical possibilities.

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**REDESIGNING THE BRAIN**

Can we change our brains to sharpen perception and memory, increase speed of thought, and heal learning problems? Michael Merzenich is proving that we can.

**UNIVERSITY OF CALIFORNIA** neuroscientist **Michael Merzenich** has made the most ambitious claim in his field: that brain exercises may be as useful as drugs to treat diseases as severe as schizophrenia; that brain ‘plasticity’ exists from the cradle to the grave; and that radical improvements in cognitive functioning – how we learn, think, perceive, and remember – are possible, even in the elderly.

Merzenich claims that when learning occurs in a way consistent with the laws that govern brain plasticity, the ‘mental machinery’ of the brain can be improved so that we learn and perceive with greater precision, speed, and retention. Clearly when we learn, we increase what we know; but his claim is that we can also change the very structure of the brain itself and increase its capacity to learn.

Though he was not the first scientist to demonstrate ‘neuroplasticity,’ it was through experiments he conducted early in his career that mainstream neuroscientists came to accept the plasticity of the brain. “The cerebral cortex,” he says of the thin outer layer of the brain, “is actually selectively refining its processing capacities to fit each task at hand.” It doesn’t simply learn; it is always “learning how to learn.”

The brain Merzenich describes is not an inanimate vessel that we fill; rather it is more like a living creature with an appetite, one that can grow and change itself with proper nourishment and exercise.

**Brain Mapping**

To understand how ‘brain maps’ can change, we need first to have a picture of them. Brain maps were first made vivid in human beings by Dr. **Wilder Penfield** at the **Montreal Neurological Institute** in the 1930s. For Penfield, ‘mapping’ a patient’s brain meant finding where in the brain different parts of the body were represented and their activities processed. Penfield discovered that the frontal lobes were the seat of the brain’s motor system, which initiates and coordinates the movement of our muscles. The three lobes behind the frontal lobe – the temporal, parietal, and occipital lobes, comprise the brain’s sensory system, processing the signals sent to the brain from our sense receptors – eyes, ears, touch receptors, and so on.

He spent years mapping these parts of the brain, discovering that when he touched a patient’s sensory brain map with an electric probe, it triggered sensations that the patient felt in his body. Normally, when one’s hand is touched, an electrical signal passes to the spinal cord and up to the brain, where it turns on cells in the map that make the hand ‘feel’ touched. Penfield found he could also make the patient feel his hand was touched by turning on the ‘hand area’ of the brain map electrically; when he stimulated another part of the map, the patient might feel his arm being touched. After many operations, he was able to show where on the brain’s sensory map all parts of the body’s surface were represented.

Penfield did the same for the motor map, the part of the brain that controls movement. By touching different parts of this map, he could trigger movements in a patient’s leg, arm, face, and other muscles. One of his great discoveries was that brain maps, like geographical maps, are topographical, meaning that areas adjacent to each other on the body’s surface are generally adjacent to each other on the brain maps. He also discovered that when he touched certain parts of the brain, he triggered long-lost childhood memories.

**Illustration by Amedeo De Palma**

*By Norman Doidge*
or dreamlike scenes – which implied that higher mental activities were also mapped in the brain.

These maps shaped several generations’ views of the brain. But because scientists believed that the brain couldn’t change, they assumed, and taught, that these maps were fixed, immutable, and universal – the same in each of us, though Penfield himself never made either claim. Merzenich’s key discovery was that brain maps are neither immutable within a single brain nor universal, but vary in their borders and size from person to person. In a series of experiments, he showed that the shape of our brain maps changes depending upon what we do over the course of our lives. Merzenich also observed that the new topographical maps were forming in slightly different places than before: maps were dynamic.

**A War of Nerves**
The ‘competitive’ nature of brain plasticity affects us all. There is an endless war of nerves going on inside each of our brains. If we stop exercising our mental skills, we do not just forget them: the brain map space for those skills is turned over to the skills we practice instead. If you ever ask yourself, “How often must I practice French, or guitar, or Math to keep on top of it?” you are asking a question about competitive plasticity. You are asking how frequently you must practice one activity to make sure its brain map space is not lost to another.

Competitive plasticity in adults even explains some of our limitations. Think of the difficulty most adults have in learning a second language. The conventional view now is that the difficulty arises because the critical period for language learning has ended, leaving us with a brain too rigid to change its structure on a large scale. But the discovery of competitive plasticity suggests there is more to it. As we age, the more we use our native language, the more it comes to dominate our linguistic map space. Thus it is also because our brain is plastic – and because plasticity is competitive – that it is so hard to learn a new language and end the tyranny of the mother tongue.

But why, if this is true, is it easier to learn a second language when we are young? Is there no competition then, too? Not really. If two languages are learned at the same time, during the critical period, both get a foothold. Brain scans of a bilingual child, says Merzenich, show that all the sounds of its two languages share a single large map, a ‘library’ of sounds from both languages.

Competitive plasticity also explains why our bad habits are so difficult to break or ‘unlearn.’ Most of us think of the brain as a container, and learning as putting something in it. When we try to break a bad habit, we think the solution is to put something new into the container. But when we learn a bad habit, it takes over a brain map, and each time we repeat it, it claims more control of that map and prevents the use of that space for ‘good’ habits. That is why un-learning is often a lot harder than learning, and why early childhood education is so important: it’s best to get it right early, before ‘bad habits’ get a competitive advantage.

In a few short years Merzenich discovered that adult brains are plastic, persuaded skeptics in the scientific community that this was the case, and showed that experience changes the brain. But he still hadn’t explained a crucial enigma: how brain maps organize themselves to become topographical and function in a way that is useful to us.

As mentioned earlier, when we say a brain map is organized topographically, we mean that the map is ordered as the body itself is ordered. For instance, our middle finger sits between our index finger and our ring finger. The same is true for our brain map: the map for the middle finger sits between the map for our index finger and that of our ring finger. Topographical organization is efficient, because it means that parts of the brain that often work together are close together in the brain map, so signals don’t have to travel far in the brain itself. The question for Merzenich was, how does this topographic order emerge in the brain map?

The answer he and his team came to was ingenious: a topographic order emerges because many of our everyday activities involve repeating sequences in a fixed order. When we pick up an object the size of an apple or baseball, we usually grip it first with our thumb and index finger, then wrap the rest of our fingers around it one by one. Since the thumb and index finger often touch at almost the same time, sending their signals to the brain almost simultaneously, the thumb map and the index finger map tend to form close together in the brain (‘neurons that fire together wire together’). As we continue to wrap our hand around the object, our middle finger will touch it next, so its brain map will tend to be beside the index finger and farther away from the thumb. As this common grasping sequence – thumb first, index finger second, middle finger third – is repeated thousands of times, it leads to a brain map where the thumb map is next to the index finger map, which is next to the middle finger map, and so on. Signals that tend to arrive at separate times, like thumbs and pinkies, have more distant brain maps, because ‘neurons that fire apart wire apart.’

Many, if not all brain maps work by spatially grouping together events that happen together. As we have seen, the auditory map is arranged like a piano, with mapping regions for low notes at one end and high notes at the other. Why is it so orderly? Because the low frequencies of sounds tend to come together with one another in nature. When we hear a person with a low voice, most of the frequencies are low, so they get grouped together.

As neurons are trained and become more efficient, they can process faster. This means that the speed at which we think is itself plastic. Speed of thought is essential to our survival. Events often happen quickly, and if the brain is slow, it can miss important information. Faster neurons ultimately lead to faster thought – no minor matter, because speed of thought is a crucial component of intelligence. IQ tests, like life, measure not only whether you can get the right answer, but how long it takes you to get it.

**The Role of ‘BDNF’**
In the late 1980s, the discovery of the nerve-growth factor known as ‘brain-derived neurotrophic factor,’ or BDNF, caught Merzenich’s attention. BDNF plays a crucial role in reinforcing plastic changes made in the brain in the critical period. According to Merzenich, it does this in four ways.
When we perform an activity that requires specific neurons to fire together, they release BDNF. This growth factor consolidates the connections between those neurons and helps to wire them together so they fire together reliably in the future.

During the critical period BDNF turns on the nucleus basalis, the part of our brain that allows us to focus our attention—and keeps it on, throughout the entire critical period. Once turned on, the nucleus basalis helps us not only pay attention but remember what we are experiencing. It allows map differentiation and change to take place effortlessly. Merzenich told me, “It is like a teacher in the brain saying, ‘Now this is really important—this you have to know for the exam of life.’” Merzenich calls the nucleus basalis and the attention system the “modulatory control system of plasticity”—the neurochemical system that, when turned on, puts the brain in an extremely plastic state.

The fourth and final service that BDNF performs is to help close down the critical period. Once the main neuronal connections are laid down, there is a need for stability and hence less plasticity in the system. When BDNF is released in sufficient quantities, it turns off the nucleus basalis and ends that magical epoch of effortless learning. Henceforth, the nucleus can be activated only when something important, surprising, or novel occurs, or if we make the effort to pay close attention.

These findings open up the possibility of high-speed learning later in life. The nucleus basalis could be turned on by an electrode, by micro-injections of certain chemicals, or by drugs. It is hard to imagine that people will not—for better or for worse—be drawn to a technology that would make it relatively effortless to master the facts of Science, History, or a profession, merely by being exposed to them briefly. Imagine immigrants coming to a new country, able to pick up their new language with ease and without an accent, in a matter of months. Imagine how the lives of older people who have been laid off from a job might be transformed, if they were able to learn a new skill with the alacrity they had in early childhood. On the down side, such techniques would no doubt also be abused by high school and university students in their studies and in competitive entrance exams.

Such aggressive interventions might have unanticipated, adverse effects on the brain—not to mention our ability to discipline ourselves—but they would likely be pioneered in cases of dire medical need. For instance, turning on the nucleus basalis might help brain-injured patients, many of whom cannot relearn the lost functions of reading, writing, speaking, or walking because they can’t pay close enough attention.

Preserving Brain Plasticity

Merzenich’s company, Posit Science, is devoted to helping people preserve the plasticity of their brains as they age and extend their mental lifespans. “It’s estimated that by the time someone who is 65 now dies, the life expectancy will be in the late 80s. Well, when you are 85, there is a 47 per cent chance that you will have Alzheimer’s disease. So we’ve created this bizarre situation in which we are keeping people alive long enough so that on the average, half of them get this awful disease. We’ve got to do something about the mental lifespan, to extend it out and into the body’s lifespan.”

Merzenich thinks our neglect of intensive learning as we age leads the systems in the brain that modulate, regulate, and control plasticity to waste away. His way of attacking mental decline is at odds with mainstream Neuroscience. Thousands of papers written about the physical and chemical changes that occur in the aging brain describe processes that occur as neurons die. There are many drugs on the market designed to block these processes and raise levels of falling chemicals in the brain. Yet, Merzenich believes that such drugs provide only about four to six months of improvement.

“Is something really wrong about all this,” he says. “It neglects the role of what is required to sustain normal skills and abilities. It is as if your skills and abilities, acquired in the brain at a young age, are just destined to deteriorate as the physical brain deteriorates.” The mainstream approach, he argues, is based on no real understanding of what it takes to develop a new skill in the brain, never mind to sustain it. “It is imagined,” he says, “that if you manipulate the levels of the right neurotransmitter, that memory will be recovered, and cognition will be useful, and that you will start moving like a gazelle again.”

The mainstream approach doesn’t take into account what is required to maintain a sharp memory. A major reason memory loss occurs as we age is that we have trouble registering new events in our nervous systems, because processing speed slows down, so that the accuracy, strength, and sharpness with which we perceive declines. If you can’t register something clearly, you won’t be able to remember it well.

Middle age is often an appealing time because, all else being equal, it can be a relatively placid period compared with what has come before: our bodies aren’t changing as they did in adolescence; we’re more likely to have a solid sense of who we are and be skilled at a career. We still regard ourselves as active, but we have a tendency to deceive ourselves into thinking that we are learning as we were before. We rarely engage in tasks in which we must focus our attention as closely as we did when we were younger, trying to learn a new vocabulary or master new skills. Such activities as reading the newspaper and practicing a profession of many years are mostly the replay of mastered skills, not learning. By the time we hit our 70s, we may not have systematically engaged the systems in the brain that regulate plasticity for 50 years.

A major reason memory loss occurs as we age is that we have trouble registering new events in our nervous systems. Processing speed slows down, so that the accuracy, strength, and sharpness with which we perceive declines.
Because it requires intense focus, studying a new language turns on the control system for plasticity and keeps it in good shape for laying down sharp memories of all kinds. Anything that requires highly-focused attention will help that system—learning new physical activities that require concentration, solving challenging puzzles, or making a career change that requires that you master new skills. Merzenich himself is an advocate of learning a new language in old age. “You will gradually sharpen everything up again, and that will be highly beneficial to you.”

The same applies to mobility. Just doing the dances you learned years ago won’t help your brain’s motor cortex stay in shape. To keep the mind alive requires learning something truly new, with intense focus. That is what will allow you to both lay down new memories and have a system that can easily access and preserve the older ones.

Posit Science has developed exercises for memory of words and language, using listening exercises and computer games for auditory memory designed for adults. Instead of giving people with fading memories lists of words to memorize, as many self-help books recommend, these exercises rebuild the brain’s basic ability to process sound, by getting people to listen to slowed, refined speech sounds. Merzenich says they have been able to turn back the clock on people’s cognitive functioning so that their memories, problem-solving abilities, and language skills are more youthful again. “We’ve driven people to abilities that apply to a much more youthful person—that an 80-year-old is acting, operationally, like they are 50 or 60. Everything that you can see happen in a young brain can happen in an older brain.”

In closing
Having devoted years to enlarging brain maps, Merzenich now believes there are times when you may want to shrink them. He has been working on developing a ‘mental eraser’ that can eliminate a problematic brain map. This technique could be of great use for people who have post-traumatic flashbacks, recurring obsessional thoughts or phobias.

Merzenich continues to challenge the view that we are stuck with the brain we have at birth. The ‘Merzenich brain’ is structured by its constant collaboration with the world, and it is not only the parts most exposed to it, such as our senses, that are shaped by experience. Plastic change, caused by our experience, travels deep into the brain and ultimately even into our genes, molding them as well.
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Rotman
A FRIEND OF MINE WITH A BACKGROUND IN MEDIA recently found himself in the role of CEO of a major government department. One of the first things he noticed is how abused the word ‘strategy’ is: everything has to be a strategy in order to get noticed. He was sure someone would have a strategy for visiting the restrooms. But the second thing he noticed was that no-one was actually thinking strategically: the more the word was used, the less meaningful it became.

It should not be like this. Strategy should be the process that enables organizations to create new futures and engage their people in exciting tasks. Instead, it mostly weighs an organization down with more data and inputs.

Arguably the strategy process is one of the weakest processes in most organizations. They are far better equipped with the tools for operational management and ‘defending the status quo’ than they are for inventing and shaping new futures, and there is a good reason for this: modern organizations exist at the ‘delivery end’ of the thinking life cycle, not at the discovery end.

Once an organization becomes mature and viable, it stabilizes ideas into structures, and ‘efficiency’ becomes its overriding goal. But strategy is not about delivery and efficiency: it is about discovering alternative possibilities. Inherently, this will challenge the hypotheses on which the organization is built. Seen in this light, strategy will threaten the organization’s stability, so the organization will immunize itself against it. The budget process is a practical example of how this ‘immune system’ works: it hardwires yesterday’s assumptions about inputs and outputs into plans and commitments, and so habituates organizations into preserving the status quo.

We need a new approach to strategy that can unlock fresh energy and make it more innovative and less data driven. This is what design thinking can offer.

A Two Roads Story
The heart of the Two Roads story is that the western world bought the wrong thinking system from Aristotle. This ranks as one of the worst investment decisions our civilization has made, and it has led us into using the wrong toolkits for our enterprises
ever since. The thinking system we invested in was Aristotle’s ‘analytics’, and we made the choice around the era of the Enlightenment which ushered in what we today call the Scientific Age. That decision has proven so sweeping that it now monopolizes what most people characterize as ‘thinking.’ Thinking processes are dominated by the culture of the sciences, and you get no better evidence of this than our universities, the home of thinking, where any subject must position itself as a science to be taken seriously. Traditional approaches to strategy sit fairly and squarely at this table of logic and Science.

What few people realize is that Aristotle conceived two thinking systems, not one. We made the big mistake of just buying one, and allowing it to monopolize the whole territory of thought. We should have bought them both, and used them as partners. Instead we have only one thinking tool in our hands and we are using it for all the wrong purposes. Here is how it happened.

Aristotle was the first person to codify thinking into a system. He did this for a reason: he lived in perhaps the most dramatic social experiment of human history, the invention of democracy by the Greek leader Kleisthenes around 450 BC. This political system did what no other had tried to do: it delivered decision making into the hands of human beings. Prior to that, regimes were governed by the king or the gods. That meant that no matter how sophisticated they might have been in terms of Engineering or Mathematics, they were not sophisticated about human reasoning, especially where decision making was concerned. Clearly, Kleisthenes’ political reforms created a great need to codify the processes by which humans think and can arrive at ‘truths.’ If ever there was a do-it-yourself manual, this was it! Ordinary humans were playing god in Aristotle’s Greece.

The Logic Road
In answer to this demand, Aristotle invented the great ‘truth making’ machine of logic, and he brilliantly described it in his books on the Analytics. The heart of the machine was the ‘syllogism,’ and it dominates the works: if a=b, and b=c, then a=c. This formula could take inputs and compute them into truth claims that were universally true and incontrovertible.
In one brilliant essay, Aristotle laid down the path for deductive reasoning that has dominated the western mind for the last 300 years. With it, we have built what I call the ‘logic road,’ and it carries pretty much all of our intellectual traffic these days. The reason for its appeal is not so much the method but what it offers – control and certainty. If I can pull apart any system into its working parts and then explain it in cause-and-effect relations, surely I will be able to fully know the truth about this system. That knowledge will give me control; there will be no surprises, and I will be in the box seat. And with control I will also get certainty: I can predict outcomes and guarantee results.

The logic road convinced us more than it convinced Aristotle. He was always uneasy about the inputs into the system. He was confident that his inference-making engine worked well, but what if we could not trust the inputs? He never answered that question to his satisfaction (consider the last two pages of his Analytics where he confronts this worry); but centuries later, two great minds conspired to apparently patch up the inputs question and thus ‘logic’ became that only numbers were unambiguous and ‘true.’ With this they declared that this domain was not the only domain of nature or any realm where things do not change, by all means use the logic road. But he said that this domain was not the only domain for truth making. There was a second domain which he characterized in the memorable phrase, ‘where things can be other than they are.’ By this he meant the whole domain of human decision making, where we in fact ‘play god’ and determine alternative futures.

For this second domain, Aristotle conceived an entirely different thinking pathway that combined invention, judgment and decision wrapped up in a social process of debate. He called this process ‘rhetoric’ or ‘dialectic’, and I call it the Second Road to truth. Aristotle described it just as fully, as his analytic engine in various books including the Rhetoric and the Topica. The critical difference between the two roads is always best understood by the different domains of question that they address: rhetoric was the road by which humans designed alternative futures; analytics was the road by which we diagnosed what already exists.

As Richard Buchanan of Carnegie-Mellon University has brilliantly demonstrated in a series of landmark essays, design is the modern rhetoric. The significance of this cannot be overstated: if strategy is in fact a design process, it has been using an incomplete toolkit to date.

Human beings do not analyze their way into the future. In fact, we cannot analyze our way one inch into the future, for the simple reason that the future does not exist yet, so it is not there to analyze. Let me demonstrate this to you quite simply. At the heart of the logic road lies the idea of proof and empirical reasoning. This is hard wired into our culture by the common challenge, “Prove it!” If I cannot ‘prove’ a hypothesis, then I am undone.

Suppose I propose a dream for our organization in which I imagine an alternative situation, different from and much more desirable than the present situation. When management challenges me to “prove it!” I cannot do this, for the simple reason that my dream lies in the future and thus is beyond proof. Yet if I am so challenged and I reply, “Sorry I cannot prove it...but I believe it!” I would feel weak and defensive in most organizational cultures. The reason I would feel so defensive is that our whole paradigm is dominated by the analytic system – and it is out of this dominant thinking system that the challenge to ‘prove it’ flows.

The Power of Argumentation

If we cannot analyze our way into the future, how do we move ahead? The answer is ‘by arguments,’ and it is the art of
We cannot analyze our way one inch into the future, for the simple reason that the future does not exist yet, so it is not there to analyze.

Argumentation that lies at the heart of the Second Road.

Arguments are the engines by which humans create alternative futures. The great Roman leader, Cicero, was an avid follower of Aristotle and quite possibly the greatest rhetorician of all time. He claimed that all human civilization was built on the pathway of rhetoric and memorably imagined uncivilized tribes arguing their way out of caves and into villages. Picture the first natives to start the argument:

“We don’t have to keep sheltering high up in these caves forever. I reckon we can live happier lives way down by the river close to the water and our hunting grounds.”

“So how do we do that, praytell, without freezing to death in the winter months?”

“Good question, but I have this idea – let’s call it a ‘hut’ – which we could make out of the timber from old trees…”

“You are always dreaming, you fool…but the idea of huts has some attraction…take it further for me.”

In that dynamic of argument lies the whole momentum of progress, according to Cicero: if Cicero’s cave dwellers used Aristotle’s logic road to improve their lives, they would still be there today analyzing the rock structures of caves. But they are not, because the human genius for argumentation enables us to craft alternative destinies.

Every strategy is an argument, every plan is an argument and every design is an argument. The concept of ‘argument’ opens a door onto a new landscape of tools and pathways to craft strategy and make it the ‘design’ process that it naturally is.

Following are three critical elements of the Second Road toolkit that have proven transformational for the managerial groups I have worked with. I name each with both a classical term of rhetoric and a modern term of management.

1. Agency (Corporate Intent)
The first element of a compelling argument is ‘agency.’ In the scientific process, you aim to keep people out of it: we are taught to be ‘objective’ and not bring ourselves into the thinking process. This confines the scientific thinking process to being merely cognitive. In the Second Road, the opposite is the case: we humans become the ‘causes’ that create ‘effects.’ We must become ‘agents’ if we want to change things. This repositions strategy as an act of the will, not just of cognition. Strategy crystallizes the corporate will. This fundamentally changes how we view strategy: it is as much a matter of the will as the intellect.

However, most people don’t feel like agents, and the modern organization does not help that feeling with its emphasis on compliance, hierarchy and command/control relationships. If we want to get people to design their futures, our first task is to emphasize their ‘agency.’ They must feel that the world is not an accident, nor is it ‘determinate’: it is putty in their hands and they are its authors.

There are two stances we can take into life. We can see ourselves as ‘readers’ in which case we believe that someone else ‘writes’ the text of life and our job is to read it. Ironically, the more educated we become, the more we feel like readers, since most education is framed in the analytic paradigm and literally enforces a disposition of ‘readers’ on the students. The alternative disposition sees us as ‘authors’: life is a canvas and our job is to write the story, not read it.

I ran a workshop recently for the leaders of a major newspaper organization with a great past but an uncertain future in the online world. They had pages of analysis before them, and most of it was depressing. We began the workshop by asking, “Do you believe that this organization has a credible future? Is it worth the effort of creating a strategy or do you feel that long term decline is really inevitable?” The question surprised them and evoked a spirited and open discussion for two hours. When we finished they agreed that there was a hopeful future, and it lay in nobody’s hands but their own. They had moved from being ‘readers’ to ‘authors.’

2. Possibility (Invention)
The second element of a compelling argument is ‘possibility.’ True design is the art of invention, not analysis. You cannot analyze your way to invention. So how do we do it? Whereas analysis is a process that works like a formula, invention is an art that works like a forge. We must melt down fixed ideas and views, allow them to swirl around and then shape them into new combinations. The process is one of immersion and emergence, not analysis. Sound strange to you? Watch a painter paint a landscape or a poet exploring ideas and you will see it happen in practice. This is design thinking at work. It does not work like a spreadsheet.

In my work I try to stimulate this kind of thinking by shifting the dynamic of the strategy process from documentation to conversation. Most strategic processes rely far too heavily on documentation; but documents were not made to generate ideas, they were made to codify and communicate them. Furthermore, documents are primarily an individualistic tool, not a social one. People write documents alone and they read them alone. Conversation is different: it is a melting pot of ideas – a living.
organic process. It is a perfect way to generate possibilities and create arguments.

My team and I have mapped the conversation process in an image we call the ‘Design Wave™’ (see Figure 2). Arguments are developed by advancing topics across this wave. Things start out foggy, but then crystallize as we transform confusion into arguments that can mobilize action. But conversations need some structure, or they will unravel and achieve nothing. We do this by using the writing process (rather than documents) to structure the dialogue. Good writers explore ideas by sketching them with maps and models. We create virtual design studios where groups start with a blank sheet and ‘write’ their strategy by a process of dialogue. We shape and guide the energy that the conversation creates by mapping and modeling in real time on an electronic whiteboard. This effectively transforms the group into designers who are using heavily right-brain tools of visualization, modeling and prototyping ideas.

If I could turn on a video camera and show you one strategic conversation that we facilitated recently for instance, you could have watched Australia’s aboriginal leaders design a way forward for our indigenous community that aims to rewrite 200 years of sorry history. You would have seen the swirl of dialogue melt down fixed positions and transform them into new possibilities. Immersion and emergence happened before our eyes. The Second Road is not just theory for us; it is an art of action. And rhetoric was not a theory for Cicero and his friends. It was an art of action and design.

3. Persuasion (Community of Action)
The third element of an argument is ‘persuasion.’ In the scientific road, persuasion is not the goal – proof is. In the Second Road, persuasion is the goal because the aim of the argument is to mobilize people to create a new future. This has two significant consequences for strategy as design. Firstly the criteria of a good strategy changes; we cannot look for the ‘right’ strategy, we must instead look for the ‘compelling’ strategy. Good arguments compel belief. The second consequence is that an effective strategy process will not just produce a ‘plan’, it will produce a community of action: that is our real goal. Nothing is stronger than a persuaded community: they will create alternative worlds.

A New Theory of Language
Underpinning this whole Second Road of rhetoric/design lies a fundamental new belief about the nature of language. In the analytic paradigm, language is descriptive. It is a tool to put labels on the world. Its role is passive: it merely enables communication. Little wonder that the analytic world has now passed the baton of power to Mathematics as the underpinning tool of trade.

The rhetoric road operates from a fundamentally different and emerging belief that language creates new realities, it does not just describe them. If I name a situation as ‘hopeless’, that will create hopelessness; if I name a situation as ‘promising’, that will create promise. In this view, language is an agent of design.

Design begins with language that creates proxies for alternative futures long before they exist in material form. Viewed that way, language is the raw material we use to create our current and future realities. The Second Road builds arguments or designs out of the playground of language; the first road of analytics has narrowed the whole playground to the skimpy perimeter of empirical reasoning and spreadsheets.

In closing
My work always takes me to groups facing uncertain, often troubled, prospects. They have a choice: ‘keep operating as normal and let the future happen to us’ or ‘design our world.’ In every case, a tool kit comprised only of analytic tools would have been at least inadequate, or at worst, counterproductive.

Design offers organizations a new paradigm of thought and a whole set of practices that can revolutionize how we ‘do’ strategy, and more ambitiously, how we build great organizations. The tool kit outlined herein does not stop there in its implications: it is relevant to the worlds of education, social design and human enterprise everywhere.

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INFORMING OUR INTUITION

DESIGN RESEARCH FOR RADICAL INNOVATION

Radical innovation requires both evidence and intuition: evidence to become informed, and intuition to inspire us in imagining and creating new and better possibilities.

By Jane Fulton Suri

THE TERM ‘RESEARCH’ shows up in the context of design and innovation in multiple guises, not all of them positive. For some people it connotes ‘data collection’—looking to the past and present but not to the future; for others it’s simply a required step before coming up with ideas; for yet others it’s a filter that rejects promising ideas before they’ve had a chance to evolve.

The truth is that research can be an immensely positive force in the innovation journey. But to derive value from it, we must be willing to complement, challenge, and evolve many of the approaches and practices that traditionally prevail.

Starting out as a human-sciences graduate, I believed passionately that research could help us reach a better understanding of people—their needs, desires, habits and perceptions—and that this would lead to better decisions about what and how things get designed and put into the world. I still believe this today, but I now have a much more nuanced perspective of what it takes and have come to understand that different challenges require different approaches.

New Kinds of Innovation Challenges
At the beginning of my career I worked on projects that involved
influencing the design of things that already existed: urban housing in Scotland, motorcycles, power tools, washing machines, and elements of public transit systems. Effective research in such cases relies upon carefully gathering and analyzing existing evidence. By looking at current behaviour in existing situations, at records of sales, at complaints and incidents, and by asking people about their desires, problems, and preferences, it wasn’t hard to find good ways to innovate by incrementally improving the existing designs.

Later, in the early 1990s at IDEO, I was given the chance to work on things that were completely new to the world, such as some of the first digital cameras, and medical processes and devices that neither doctors nor patients had experienced before. I also began to conceive and develop new offerings aimed at specific groups of people – educational games for children, a new kind of drink for athletes, and tools and services for people travelling on vacation.

These days, many of the innovation challenges we face in the workplace are framed in an even more open-ended way:

• How can we leverage the value of this brand to increase its reach?
• Here’s an amazing new technology – what applications would be good business opportunities?
• There hasn’t been real innovation in our industry for a decade or more – what can we do to change that?
• We already own this market category – what’s going to be our ‘next big thing’?

Responding to such challenges involves a more radical kind of innovation than that required to improve something that is already familiar. In this more radical context, it is much less clear what kinds of innovations might catch on and how new offerings might influence people’s future habits, which presents a different challenge to research: how can you find out what is going to matter to people if it doesn’t yet exist? And this new thing that you might develop (but that doesn’t yet exist) – how do you discover what kind of people it might appeal to?

In cases such as these, effective research is not just about analysis of objective evidence – there isn’t any directly applicable data anyway; it’s also about the synthesis of evidence, recognition of emergent patterns, empathic connection to people’s motivations and behaviours, exploration of analogies and extreme cases, and intuitive interpretation of information and impressions from multiple sources. This type of approach is now often referred to as ‘design research’ to differentiate it from purely analytic methods. At its core, design research is about informing our intuition.

The Role of Intuition

In innovation projects – particularly those that are more radical in scope – discovery and decision making cannot rely exclusively on analytic processes. By definition, as soon as we start to think ahead to future experiences and how people might respond, we begin to draw upon our intuitive and interpretive abilities. We begin to imagine and empathize.

Of course, imagination and empathy can also run into realms of fantasy. As Malcolm Gladwell reminds us in Blink: The Power of Thinking Without Thinking, intuitions can be spot-on, but they also can be misleading and, sometimes, simply wrong. Imagination, empathy and intuitive leaps – so important in innovation – also need to be informed by experience and tempered by continual doses of reality.

Design research both inspires imagination and informs intuition through a variety of methods with related intents: to expose patterns underlying the rich reality of people’s behaviours and experiences, to explore reactions to probes and prototypes, and to shed light on the unknown through iterative hypothesis and experiment. Innovation projects have different scopes and different starting points, ranging from the incremental – enhancements to known offerings in a known market with well-understood consumers and usage patterns – to the more radical, in which the intent is to create new offerings for which there is not yet a market or established behaviours.

Innovation is an activity that socially and emotionally affects everyone involved. Teams, investors, and sponsors all have a lot at stake. During the innovation journey, we must be willing to apply
creativity, energy, and enthusiasm to an uncertain venture that has the potential for significant impact on our personal future and the success of our business. In addition, we need to stay motivated, curious to explore, yet responsible about investing time and materials. Positive outcomes can’t be guaranteed, but everyone needs confidence and reassurance along the way. It’s not realistic to expect blind faith and optimism to carry this process forward.

**Sources of Confidence**

As a reaction to inevitable risk and uncertainty, many organizations establish consumer research processes as a way of deciding what programs to support, and many employ methods that have been optimized to assist in decision making about incremental innovations. For incremental innovation, by definition, there is a history of actual market performance against which to calibrate new concepts, so it makes sense that we assess ideas using processes and objective pass/fail criteria that have proven to be good predictors in the past.

Unfortunately, these same processes often work against our ability to innovate effectively in more radical ways – to create ‘disruptive’ innovations. As Clayton Christensen writes in *The Innovator’s Solution: Creating and Sustaining Successful Growth*:

> Not surprisingly, disruptive ideas stand a small chance of ever seeing the light of day when they are evaluated with the screens and lenses a company uses to identify and shape sustaining innovations. Companies frustrated by an inability to create new growth shouldn’t conclude that they aren’t generating enough good ideas. The problem doesn’t lie in their creativity; it lies in their processes.

Processes that are good at instilling confidence when it comes to directions for incremental innovation can be inappropriately limiting and personally discouraging to more radical innovation efforts, in which many variables are unknown or unknowable. It is heartening to see organizations like Hallmark, Herman Miller, Intel, Motorola, Procter & Gamble and Whirlpool actively developing and applying design research methods as they strive for more radical innovation and for more empathic and intimate understanding of consumers.

**Integration and Engagement**

Design research is most valuable when it is treated as integral to the innovation process rather than as an external activity. To inform intuition, it is important to have team members actively interpret the richness of evidence and discoveries as they emerge. Research that brings rich information will provide not just facts, but insights and possible reasons behind the facts. Even seemingly bad news – that we have been considering something that seems to be a fruitless opportunity or a concept with serious flaws – can serve as inspiration for new and better ideas, instead of signaling a depressing failure. With richly understood bad news, we can adjust our assumptions and perhaps see a new opportunity to move in a more fruitful direction. A huge opportunity for learning is missed when research phases are simply tacked on to a program as ‘safeguarding’ or when research activities are outsourced to a separate team.

To be effective, decisions informed by design research demand a much higher level of personal commitment and engagement at all levels within an organization than do judgments based purely upon hard facts and objective data. Design research often means changing the way work gets done. It means getting out of the office, being where customers are, becoming aware of and sensitive to social trends and the broad ecology of stakeholders, rolling up our sleeves to try out unfamiliar things first hand.

The largely qualitative and interpretive nature of design research is its strength, but this also makes it potentially vulnerable to invalid or ill-founded conclusions. In order to be done well, design research demands that everyone involved be prepared to grapple diligently with ambiguity and nuance. It asks us to bring creative energy to the synthesis of confusing and conflicting information, to be willing to challenge and adapt our own and our colleagues’ interpretations, and to stress-test these interpretations both with other points of view and in the harsh light of relevant evidence, even if such evidence is not statistically-proven fact.

This degree of direct involvement often brings another advantage to the design and innovation process – that of creating common ground and shared perspectives among people representing multiple functions within an organization, in ways that have seemed previously unachievable. Enabling teams to share raw evidence and create meaningful frameworks, principles, goals, criteria, and priorities together energizes movement forward with much more enthusiastically supported ideas and greater confidence. In this way, successful design research first requires, then perpetuates, forms of cultural transformation in organizations that enable radical innovation to thrive. What, then, does it feel like to make this kind of commitment to informing our intuition?
Design Research in Practice

Let’s get more specific about what it actually means to conduct design research. Typically, research processes used in new product development combine multiple objectives into a single exploration. A survey tool, for example, may be constructed both to seek out consumer insight about opportunities and to field a sample-size that enables statistical estimations of scale. Or a series of focus groups may be used to explore both the appeal of an early idea and the size of the potential market.

For known markets and offerings, this approach seems to work reasonably well. But in research for radical innovation, compromising the potency of a single research objective leaves important questions unanswered: we know what people say they want, but do their behaviours really support this? How can we use the best of our half-baked ideas to create a better, more integrated experience for consumers? How can we assess the likely size of an opportunity if we have nothing to directly compare it with?

In research for radical innovation, there’s great value in separating these objectives – distinguishing the types of questions we want to answer and creating appropriately-tailored tools to apply at different points throughout the innovation process.

Design research addresses three different kinds of questions with respect to innovation:

- **Generative**: gaining insights and opportunities – research that provides human-centered insight, revealing new ways of framing opportunities and inspiring new ideas.
- **Evaluative or Formative**: learning and refining – research that provides continual learning throughout the process to determine the what, how, and to whom of the offering.
- **Predictive**: estimating potential – research that helps to estimate the scale and potential of an opportunity even when most variables are unknown.

Here’s how design research contributes in these three areas – and where there are important gaps to be filled.

1. **Generative design research**

Generative research involves looking for emergent patterns, challenges, and opportunities that can be addressed by innovation. The intent is that ideas about possible new offerings are informed and inspired by in-depth understanding of people’s aspirations, attitudes, behaviours, emotions, perceptions, processes, and motivations within their prevailing and evolving social, cultural, and technology context. Crucially, it is about interpreting this understanding to inspire new perspectives that disrupt current conventions and ways of seeing things.

Here’s an example from a project for an airline: innovation team members and passengers to keep a trip diary of their mood and significant events, also reported on their own trips of various kinds. Later, the team worked together as a group, integrating insights from these direct sources with more traditional forms of market research, technology, and other trend-related information relevant to travel and analogous services, to create a framework for thinking about the air-travel experience. This laid the foundation for innovation opportunities around specific service and physical design, in this case related to seating and baggage in particular.

2. **Evaluative or formative design research**

Evaluative or formative design research is essentially an iterative series of ‘learning loops.’ In design research, ideas don’t stay intangible or ambiguous for long: they are given form, whether as sketches, models, stories, videos or other kinds of prototypes. In this context, a prototype is simply a visible or tangible representation of an idea, to be thought of as a probe or thought-experiment; it is not a full-fledged pilot or a preproduction version of the real thing. And although evaluation involves an element of testing of ideas, it is less about validating and filtering the ideas than it is about providing ongoing guidance in the uncertain innovation endeavour.

Evaluative design research is about building confidence by addressing questions and uncertainties as they arise. Frameworks, ideas, and concepts are shared in various ways as prototypes from very early (even in insight-gathering phases) to late in the process in order to learn from other people’s reactions, and to check, revise, and refine assumptions.

Rather than treat evaluative research as a formal and objective test, it is often more fruitful to engage with participants in a spirit of co-discovery, even co-design, in which input is valued for whatever insight it brings, whether or not it reflects well on the concept. Treated more openly as an interactive design session, evaluative research can result in valuable dialogue that engages the best of participants’ critical thinking and creativity. For example, in designing a new class of surgical instrument for use in the operating theater, some very significant breakthrough ideas were evolved via hands-on prototyping and evaluation sessions in which surgeons interacted with engineers and other team members around a simulated surgical setup.

3. **Predictive design research**

How confidently can we really predict whether a radical innovation will be a success? Predictive research refers to those research activities that are concerned with looking ahead to estimate the potential of future opportunities and ideas, primarily from the perspective of their business viability. This type of research is much less well-charted territory for design research. Designers need to be more creative in finding good ways to work through these business questions, both in helping to define potential markets and in determining the viability of ideas. There is tremendous pressure to
provide estimates of business potential to guide decision making about innovation, including its most radical forms.

In-market experimenting seems to offer great potential to radical innovation in enabling accessible, rapid, and considerably lower-risk and lower-cost learning than would a full-fledged launch. For example, Bank of America has been able to make great strides in both learning and innovation by reconfiguring several of its fully-operating branches in Atlanta to run live experiments on multiple service innovations, with real employees serving real customers in real time. A similar approach is exploited on an even larger scale by Google, through Google Labs, which has multiple experimental projects running at once and takes full advantage of the nature of hosted software to allow early launches – frequently updated in response to what is learned from users – of what effectively become eternal beta versions of their offering.

In closing
Both a personal and an organizational mind-shift are required to get comfortable with the emphasis that design research places on informing our intuition. Like many people in our culture, my formal education placed higher value upon received knowledge than upon personal discovery. But the longer I practice design and innovation, the more I am convinced that true learning comes not only from ready-processed data, but also from concrete sensory evidence and direct subjective experiences that have the power to capture our imaginations and achieve new understanding.

Design research demands commitment from innovators to reach new levels of understanding about what matters to the people we want to connect with. For radical innovation, we need both evidence and intuition: evidence to become informed, and intuition to inspire us in imagining and creating new and better possibilities.

Jane Fulton Suri is the chief creative officer at IDEO, the renowned design and innovation firm based in Palo Alto, California. She is the author of Thoughtless Acts: Observations on Intuitive Design (Chronicle Books, 2005).
Demography of Competition

Positional Advantages

Inertia and Change
THE MOTIVATING QUESTION IN STRATEGIC MANAGEMENT IS, "how can a firm differentiate itself from competitors in order to gain and sustain competitive advantage?" Different theoretical frameworks offer guidance as to how this task can be accomplished: Michael Porter’s influential Five Industry Forces Theory, for example, contends that competitive advantage resides in the structure and positioning of organizations; a ‘resource-based perspective’ attributes the chief source of competitive advantage to a firm’s unique access to scarce resources; and the ‘core competence approach’ assigns competitive advantage to the technological and organizational strengths that firms cultivate over time.

Although differing in their specifics, the various strands of Strategic Management theory all focus on the alignment (and realignment) of firms’ internal strengths and weaknesses with their external opportunities and threats. Given this theoretical orientation, and its attention to financial returns, strategy research tends to focus on application, using insights drawn from successful firms to develop concrete prescriptions for leaders: the most basic method is to observe the winners and attempt to discern ‘what makes them win’.

By contrast, Organizational Ecology, a research stream within the broader field of Organizational Sociology, seeks to explain differences in behaviour across diverse populations of organizations over time. Ecological theory emphasizes adaptation through environmental selection rather than by individual organizations. According to the theory, organizational efforts to realign with external opportunities and threats disrupt inertia, diminishing organizational performance. These evolutionary dynamics favour structurally-inert organizations. Inertia not only improves an organization’s survival chances, it is a by-product of prior success and thus a consequence of selection.

Despite sharing a focus on organizational performance, dialogue between Strategic Management and Organizational Ecology has been relatively rare. It is time for the field of Strategic Management to explore how ecological arguments can be turned into insights with managerial relevance. It is also time for ecologists
to begin to translate their arguments and findings in ways that facilitate managerial applicability. Below we attempt such a translation for three areas of ecological research that we believe are ripe for cross-pollination with Strategic Management.

1. Demography of Competition
Ecological theory is rich in ideas about how the demographic make-up of an industry – in terms of its constituent organizations – affects these organizations’ chances of success and survival. In particular, models of organizational age and size dependence define a variety of mechanisms that can either build or destroy a sustainable competitive advantage.

Firm Age
Although not a central to strategy, the question of an organization’s age is an important factor in organizational ecology, which identifies four ‘liabilities of aging.’

The first is the liability of newness. Young organizations lack the routines and experience necessary to nurture the development of capabilities. Newness may also hurt an organization’s competitive standing in industries where status and reputation, as well as an established a track record, are important sources of positional advantage.

A second liability is ‘senescence’: the performance of older organizations deteriorates because of the ‘ossifying effect’ of bureaucratization. Similar to the way a living creature may develop sclerosis, an organization can lose its ability to innovate and take collective action over time, owing to the gradual overlay of new and existing policies and work processes. A third, related form of performance decline is the liability of obsolescence, which suggests that an organization’s capability or core competence may become outdated as time passes and market demands change.

The final liability of aging is the liability of adolescence: while organizations’ chances of success are relatively high in the early years when they can rely on their initial endowments and goodwill, when these endowments are exhausted, exposing organizations’ vulnerabilities, their risk of failure increases.

Firm Size
Empirical evidence suggests that no single factor exerts a more pervasive impact on the success of an organization than its size. Ecological research has developed a nuanced and complex understanding of size effects that can be divided into two types: those about absolute effects and those about effects relative to other relevant organizations.

An example of the first type is the claim that large firms excel at producing new knowledge because they are more adept at routinely achieving innovation. Small organizations, in contrast, operate near an ‘extinction boundary.’ As such, a hardship that merely inconveniences a large organization can destroy a small one. In economic terms, the extinction boundary can be thought of as the ‘minimum efficient scale.’

Strategic Management theory reflects a long-standing view that ‘scale’ is conducive to the development of superior capabilities and market positions, and thus, in the long run, small organizations cannot win head-to-head competitions with larger ones. Ecological theory and research emphasize that smaller organizations often find ways to avoid scale-based competition: a small organization may flourish by discovering market segments that are too small to be profitably exploited by larger organizations. It may also achieve success by specializing in goods and services whose appeal comes from their perceived status or authenticity. Alternately, it may aim to tailor products to a particular customer segment through customized production.

2. Positional Advantages
Ecological theory is laden with ideas about how ecological processes affect an organization’s positional (dis)advantages. The term ‘niche,’ borrowed from bio-ecology, articulates the importance of environmental resources on which organizations depend – rather than the strategic choices they make in positioning themselves to secure those resources. A key question is how an organization’s demographic character maps onto its often complex niche structure, and how this overlap impacts organizational performance.

Niche Width
Niche width refers to an organization’s particular use of resources. Although both Strategy and Ecology research conclude that a firm’s performance generally improves with the broadening of its scope, Ecology explores the mechanisms behind this prediction in detail, and specifies cases where increased scope is not beneficial.

These basic ideas have enabled organizational ecologists to develop more comprehensive models of industry evolution, including for instance, resource partitioning. By the logic of many strategic management theories, the dominance of large
Niche Overlap and Non-overlap

Another consideration when assessing the relationship between scope and performance pertains to the strong connection between an organization’s niche width and the degree to which its niche overlaps those of other organizations. This perspective carefully assesses the advantages of niche overlap and non-overlap, weighing the pros and cons of a broad or a narrow scope in various competitive environments.

Niche overlap occurs in a competitive market where firms maneuver for position and fight for limited resources. Perhaps less familiar is the phenomenon of niche non-overlap, where firms avoid going head to head in a particular market segment, but rather seek mutualistic benefits arising from potential complementarities. Ecological enquiries into niche overlap and non-overlap offer many implications for theories of strategic (re)positioning, vertical integration, diversification, organizational learning and multipoint competition. Because firms are prone to maneuver for market position, niche overlap can inform analyses of organizational change in search of improved access to resources or lower competitive intensity.

3. Inertia and Change

From a Strategic Management perspective, the most controversial element of ecological theory is the concept of inertia. Whereas Strategic Management theory emphasizes the need for an organization to maintain its flexibility, Ecology puts a higher premium on inertia.

Relative or Structural Inertia

According to Ecology theory, because reliability and accountability – the organizational capabilities that provide the greatest selection advantage – emerge from the reproducibility of core structures and operations, inertia is a positive state for most organizations.

Ecology theory identifies a hierarchical list of four key core features, including an organization’s mission, its authority structure, its technology and its market strategy. Efforts to achieve change at the core may disrupt an organization’s reliability and accountability, for example, by triggering cascading changes throughout the organization, leading to opportunity costs that could not be expected at the outset. Many ecological studies find that core structural change is a precarious process, often leading (at least temporarily) to performance decline.

Ecology’s inertia theory offers a useful antidote against the uncritical pro-flexibility arguments that often inform strategy research. Not only does it provide an account of why organizations tend to be inert in practice, but it also argues that inertia is a consequence rather than the antecedent of selection processes.

Organizational Size and the Complexity of Core Changes

Ecological research often links structural complexity with inertia, suggesting that complex organizations are inherently less capable of initiating and surviving core changes. The relationship between scale, complexity and inertia suggests that large organizations with dense and saturated structures are hard and slow to change.

The inertia of large organizations runs counter to predictions – commonly voiced by critics of Ecology theory – that larger firms have a greater margin of error that allows them to buffer themselves from negative repercussions of core transformation. The advantage of size stems from the superior resources that large organizations command.

Empirical analyses have shown, however, that the detrimental effect of change processes on organizational performance initially increase and then decrease with size. Thus, only for the very largest organizations does the effect of superior access to resources override the deleterious effect of the change process. For the remaining subset of scale competitors undergoing core transformation, inertia considerations accurately predict their performance consequences.

These ecological analyses contribute to a better understanding of how organizational size interacts with organizational change, and of the impact of change on performance, which are also key issues in strategy.

Organizational Niche Width and Core Change

Are all inert or non-inert organizations equally likely to fail? A general answer is that some organizational characteristics might serve as buffers against inertial forces – but which ones? As organizations age and grow, they tend to become bureaucratized and burdened by obsolete structures and operations. Yet at the same time, past experiences and exposure to different contexts also provide learning opportunities. Organizations that actively promote learning and exploration might also have a greater chance of weathering the pressures of competition and change.

Organizations learn from their experiences by investing resources to search for new and better routines and solutions. The success of this strategy depends on the extent to which an organization can commit to building and sustaining viable alternatives to existing practices, and overcome the pressure to strive instead for efficiency and slack-cutting. In sorting out differences among firms in their ability to learn, ecological theory suggests the organizational niche may play a central role.

The conditions needed for learning are more likely to be found in broad-niche organizations (generalists) that operate across multiple environments and encompass large operational domains. Such firms are also experienced in transferring resources between operational units, a skill useful when organizations undergo market repositioning and need to move resources from the origin to a new destination.

The main advantage of generalists lies in their hedging strategy: they spread their bets across several alternatives with uneven pay-off opportunities. Specialists, by contrast, bet their success on
exploiting a single narrow niche. The specialist denies itself the opportunity to develop a broad set of competencies applicable to multiple market domains, or to gain experience transferring resources and capabilities across domains.

The generalist advantages of greater flexibility and higher capacity for adaptation serve as a buffer against the negative impact of the process of change. It follows that the harmful effects of change should vary by niche width, and that performance decline due to change should be less pronounced in broad-scope competitors.

The Perils of Learning

Not only can change be derailed by inertia, but inertia can emerge as an outcome of change. Once an organization undergoes a transformation, it may draw upon the experience to undertake further changes; or conversely, it may become more cautious about risking another disruption in the future. The extreme case of this latter constraint is what has been called a ‘competency trap,’ whereby organizations proceed down known courses of action even when the status quo is inappropriate.

Of course, an understanding of why organizations change requires consideration of both environmental and organizational characteristics, as well as the interplay between an organization’s characteristics and its experience. The interaction is particularly important because it reveals the internal mechanisms through which organizations interpret and react to their external context. The recent integration of ecology and learning theory reveals three aspects of experiential learning in organizations: 1) interpretation of experience, 2) complexity of experience, and 3) ambiguity of success.

Because an organization’s environment consists mostly of other organizations, its propensity to change is influenced by its relationships with competitors. As firms strive to outmaneuver their rivals, their movements can cause changes in the market structure, triggering a response from other incumbents. Organizational learning is influenced greatly by interpretation of experience. A successful change may work against an organization, if the experience causes it to misread market signals and change again when a strategy of staying the course would be more appropriate. When the market is volatile, an organization that has successfully undergone a change will have the advantage; in a stable market, however, such a firm may actually be at a disadvantage to its less experienced rivals.

Research indicates that larger firms are less likely to initiate change. One view on these findings is that complex and bureaucratic organizations are slow and clumsy, facing greater demands for balancing the needs of internal and external stakeholders. The sheer volume of information required to register and store the cumulative behaviour of a large organization can strain its management’s limits. Such complexity can make it difficult to understand what happened and why, making it harder to take future action: it is unclear what outcome might be expected, and there are ample rationales available to resist taking action. Contained in this interpretation is a paradox: organizations that are capable of collecting a large volume of information often have organizational structures that are difficult to change, while those that can change the fastest often have trouble collecting relevant information to guide it.

Organizations occupying broad niches also face problems of interpreting their experiences. A generalist organization participating in a broad array of market segments may find it difficult to discern between success and failure. The firm’s overall success can be plausibly attributed to a variety of activities by internal constituents, whether these analyses are truly relevant or not. As with complexity, the resulting plethora of rationales may inhibit future action. Thus, a broad niche width appears to be a double-edged sword when it comes to learning: on the one hand it allows for learning opportunities within the firm’s existing market position; on the other hand, it creates a confusing complexity that may lead to the transfer of routines from segments in which they are beneficial to segments where they are harmful.

By helping to specify how different types of changes, types of organizations and environmental conditions are likely to influence the results of transformation, ecological theory has much to contribute to advancing strategic management theory and research on organization change.

In Closing

We have attempted to illustrate that despite their differences, ecologists have produced many insights that are complementary to those developed in strategic management. We believe that Ecology and Strategy have much to learn from one another, and that an exchange between the fields will lead each to the development of richer and more compelling understandings of organizational strategy. Interpreting ecological arguments and findings through the lens of Strategy, as we have done here, surfaces the managerial relevance of ecological insights.
What do you know about delivering the goods without using a road?

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HOW TO SCAN FOR WEAK SIGNALS FROM THE PERIPHERY
Businesses and individuals alike must learn **how to actively scan** their environments for early warning signs of threats – and opportunities.

**by George Day and Paul Schoemaker**

**IN A HIGHLY-CONNECTED WORLD,** peripheral signals are initially difficult to capture, but they can be vital early warning signs of both threats and opportunities. Unfortunately, most of us are ‘passive scanners’ of our environment: we wait for information to reach us, and deal with it as it arrives. The danger in this practice is that it is all-too easy to miss unexpected and unfamiliar weak signals on the periphery – that blurry zone at the edge of our vision, where not many people or firms focus their attention.

Active scanning, in contrast, typically occurs in response to a specific question and is driven by organizational curiosity. The primary zones of the periphery that should be scanned on a regular basis include the macro-economic and political zones; customers and channels; competitors and complementors; technologies; and influences and shapers. Each requires different scanning approaches: some are staples of competitive intelligence, technology forecasting, and market research. Others draw on new technologies for searching the Web or for achieving deeper insights into consumers through metaphor elicitation, lead-user analysis, trend tracking, and other approaches. Following are some guidelines for addressing the periphery of your organization.

**1. Start Scanning Inside**

The larger your company, the more points of contact it will have with its periphery: salespeople are in constant touch with customers; development teams hear gossip at trade shows; retail sales clerks register complaints and requests for new items; and finance people are aware of competitors’ capital needs. Each point of contact has the potential to serve as a valuable ‘listening post.’ For example, most companies have call centers, but many treat them as costs to be minimized rather than as useful listening posts (which would require higher skill levels and more training about what to look for).

In many organizations, internal knowledge is not well connected to decision makers. For example, a CEO at one company was collecting information about a tangential competitor. At a senior management meeting, the VP for manufacturing casually mentioned that this same rival had been buying equipment similar to their own, a sign that it intended to compete head on. This competitive intelligence existed within the firm, but until this meeting the VP didn’t understand the strategic issues well enough to know that it was valuable.

To improve the ability to capture the peripheral insights within an organization, there must be

1. appropriate and visible channels for sharing information;
2. wide knowledge of the questions guiding the organization’s scanning; and
3. incentives for actually sharing useful information.
People must engage in frequent and free dialogue for the necessary connections to occur spontaneously. This, in turn, requires a culture of trust, respect, and curiosity, plus the recognition that information sharing is crucial. Too many companies still operate in a mode where information is shared on a ‘need-to-know’ basis only.

2. Listen to the Voice of the Market
In addition to scanning inside, companies can look outward to customers or channels. Consumers may change the intended use of a particular product in unanticipated ways, as with the use of cell phones for text messaging: while cell phone keypads were not designed for easy messaging, consumers (particularly teenagers) were so intent on messaging that they overcame the design limitations through clever abbreviations. Consumers are also shaping the health care space by using vitamins and alternative approaches such as chiropractic and homeopathic treatments, developed independently of mainstream Western medicine.

The periphery of the market is often obscured, however, by an abundance of routine data from call reports, territorial sales data, news releases, periodic market surveys, and others sources. The problem of seeing shifts in customers and channels can also be hampered by arrogance (“We know what the market wants because we’re out there every day selling to them”) and complacency (“The information was good enough for my predecessors, so it must be good enough for me”). Firms can overcome this insidious close-mindedness with a variety of methods for actively scanning the periphery:

• **Monitor complainers and defectors:** Myopia about customers
  can be combated by learning from complainers and defectors. Both groups are expressing a frustration that their needs are not being met. This can offer insights into the sources of growing dissatisfaction or into potential market opportunities.

- **Mind the bloggers:** An influential blogger can undermine a brand faster than any grapevine. Several firms have developed sophisticated search engines to sweep the Internet and drill down into rich veins of on-line conversation. By analyzing vocabulary, language patterns and phrasing, the programs determine whether the comments are positive or negative, and how closely associated they are with a brand of interest.

- **Track the trends:** Keeping track of broader societal trends can help to identify opportunities to create new value. Consulting companies such as Iconoculture monitor trends about lifestyles and then examine how they create opportunities for a business. Other organizations track social trends, technology trends or political ones.

- **Seek out latent needs:** The somewhat whimsical definition of latent needs as needs that are ‘evident but not yet obvious’ contains a serious message. Seeking out latent needs addresses the shortcomings of structured market research methods that impose fixed scales to obtain standardized responses from large samples. While these methods capture differences in manifest needs that are close to the surface, they obscure unsolved problems. Focusing on latent needs is how Intuit learned how to move from personal finance software to easy-to-use versions of tax preparation software and, later, to accounting software for very small businesses. Numerous techniques exist to surface latent needs, such as problem identification, storytelling, and ‘laddering’ methods to probe deeply for underlying beliefs. Other methods, such as the observation of product purchases (as is done in the ‘antennae shops’ of companies such as Sony and Sharp), in-depth studies of customer economics (including ‘spending a day in the life of a customer’), and metaphor elicitation, can further illuminate consumer values and attitudes. But all this deep digging will be of no avail without attentive listening to decode the messages in the stories and observed behaviour.

- **Leverage lead users:** These are users who experience needs ahead of the market and work to find a solution sooner. They even may have developed a novel solution already. Products such as White-Out, Sports Bras, and Gatorade all owe their existence to lead users who were ahead of the broader market and started a mini-trend. Companies can learn from these lead users.

- **Seek instant feedback:** Customers can sometimes be involved in the product development process by participating in online communities. Prototyping software lets prospective customers create or modify designs, allowing companies to screen concepts instantly. Their reactions can also give early signals of potential problems. State Farm recently queried its online community about the idea of discounts for safe drivers who had black boxes installed in their cars to monitor their driving behaviour. Most of the panel didn’t like the idea because they saw it as an invasion of privacy. This small-scale test and quick feedback allowed the company to avoid the expense of a broader initiative.
3. Study the Competitive Space

Most companies place their rivals squarely in their focal vision. The problem is that if immediate and visible threats always take precedence, attention will be diverted from new competitors lurking at the periphery. A laser-like focus on direct rivals not only leads to myopia, it also encourages imitative strategies and a demonstrable convergence of incumbents on the same choice of value propositions and scope of offerings. When everyone starts to look and compete alike, uncontested spaces may open up that attract new entrants with different business models.

The broader challenge, therefore, is to recognize rivals who are not competitors today but who could be tomorrow. Among the antidotes to a myopic focus on direct rivals are the following.

- **Widen the angle of vision**: General Electric’s erstwhile maxim that every one of its businesses be number one or two in its industry – while very effective in weeding out winners and losers – ultimately resulted in a keyhole view of the business. It led managers to define their markets narrowly to achieve the desired leadership position. This narrow definition limited the recognition of potential opportunities, and a dominant share tended to dampen insight into creative new markets or approaches. So the company then asked the leaders of its businesses to reverse this frame – to define their markets in such a way that it gave them only a 10 per cent market share. This shift meant that 90 per cent of their focus was now outside of their current business – on other competitors, regions, channels, and market opportunities in the periphery.

- **Watch out below**: Low-end competitors are often ignored or dismissed. Consider DuPont’s experience in the 1990s: early in the decade, its managers began seeing a disturbing pattern of slowed growth across its businesses, ranging from old stalwarts such as Dacron polyester to newer businesses such as nylon engineering resins. As sales declined and competition intensified, large segments of the markets for these businesses were unwilling to pay a price premium for DuPont’s superior products. Each of DuPont’s businesses independently decided to focus on the more profitable high end of their markets, conceding the low-price markets to the new rivals emerging from the periphery. These low-end entrants parlayed increased volume into ever-lower costs. The firm’s widespread myopia about the significance of low-end competitors, and its strategic retreats from markets contributed to sagging capacity utilization and increased unit costs, thereby exposing the company more to low-price competition. To learn from the past and better prepare for further attacks from below, a group of business managers got together to evaluate this new threat and the company’s successful and unsuccessful responses. As they came to understand the threat and why so many business units were missing it, they developed processes for anticipating low-end competitive threats early and for developing preemptive strategies. This group of managers became the nucleus of an organization-wide learning network that went on to identify and eliminate the root causes of the company’s ‘blind spot.’

- **Create a phantom competitor**: To sensitize your organization to a possible new player that could enter below the radar, assign a multidisciplinary team to create a ‘phantom competitor’ that is ideally structured to succeed in the market. The team needs to draw on its knowledge of the points of vulnerability of the company and the market shifts to spell out a full business strategy. Can the company itself adopt part of this strategy? Can the market situation be changed to reduce the chance that such a competitor could succeed?

- **Take cues from ‘complementors’**: A complementor is any product or service that increases the demand for your offering. For example, high-definition television (HDTV) required compatible programming before sales took off, and vice versa. Complementors may yield clues about the periphery and reveal the intentions of competitors. By looking at complementors, Sony discovered that Microsoft’s Xbox was challenging the dominant share of the worldwide game console market held by Sony’s Xbox was challenging the dominant share of the worldwide game console market held by PlayStation 2. Microsoft offered game developers a single platform of compatible programming tools to build games both for the Xbox and Windows-based personal computers. Because game software could run on both consoles, the advantage Sony gained from being the preferred platform for game developers might be jeopardized. The developers of the complementary software were a window into this strategy.

4. See Where Technologies Are Going

A company’s core technologies will obviously be its primary focus of attention, but what emerging technologies might change the game completely? While agriculture may seem far removed from technological revolutions, farmers and farm equipment manufacturers must monitor advances in tractor technology (with new equipment guided by advanced global positioning satellites, for example), biosciences (with genetically engineered seeds), and online auction sites for selling grain and other farm goods. Many small farmers, in particular, were blindsided by these changes from the periphery of their rural operations.

How can organizations keep an eye on such future possibilities while still tending the crops in the fields today? Among the approaches are the following.

- **Look in laboratories**: The prospects for many technological breakthroughs are often visible 20 or 30 years before they become an ‘overnight success.’ The computer mouse was first demonstrated in 1968, along with hypermedia and multiple windows, but it didn’t appear on the market until 1989 as part of the Apple Macintosh. The patent for facsimile transmission over wires was granted to Scottish mechanic Alexander Bain in 1843, but it did not become commercially viable until the 1980s. Future innovations may even be found in your company’s own laboratories.

- **Look for convergence**: It may be difficult to foresee the trajectory of a technology from the periphery because technological applications usually come through the convergence of streams of multiple technologies. The World Wide Web became a force when the parallel development of computer technology and online access came together. Cell phones took off with
digitization. Voice-over-Internet phone (VOIP) systems emerged only after the increased penetration of broadband Internet. Computer printing technology can be combined with advances in nanotechnology and micro-electro-mechanical-systems (MEMS)-enabled manufacturing at the submicron level to create new possibilities. A plausible result is desktop manufacturing, where plastic or metal parts are locally built, layer upon layer, according to directions from a computer.

**Think through the implications:** Once they identify potential technologies, managers must think about their implications. For example, an insurance company looking at Genomics research might consider how the ability to map the genetic makeup of policyholders could transform its business based on actuarial models. Work in Genomics raises the possibility of breakthroughs that could lead to significant shifts in longevity. Insurance companies, for example, are starting to offer longevity insurance to protect people against living beyond their assets. These policies guarantee a certain income level for life, akin to what a reverse mortgage might offer. Increases in life span would change the whole context for such offerings.

4. Learn from Influencers and Shapers

Influencers and shapers are people, groups, and organizations with influence that is out of proportion to their size. Trade associations, analysts, media commentators, academic experts, think tanks, and consultants can help identify and shape trends. The insights and agendas of these groups can unite to explore possibilities at the periphery. Following are some examples.

- **Media:** Consider the damage from a poor rating in *Consumer Reports* or a negative report on business practices in the *Wall Street Journal* or *Financial Times*. The media can deeply affect a company, industry, or economy by helping shape the attitudes of customers, investors, and other stakeholders. As noted earlier, companies must increasingly monitor blogs, podcasts, and other forms of personal journalism.

- **‘Luminaries’ or ‘mavens’:** For specific industries, ‘market mavens’ connect us with pertinent information and thus become central to world-of-mouth epidemics. For example, a few researchers and clinicians may serve as gatekeepers on the flow of information about medical products. In financial services, respected analysts have tremendous influence on investment decisions. Ask yourself, ‘What are opinion leaders saying?’ and what are the implications for the future of your business?

- **Trade and tax policy negotiators:** Although these people are often out of sight, their ability to represent the interests of an industry in the negotiation of new trade agreements can change the prospects of the industry, for better or worse. The negotiations around China joining the World Trade Organization and the creation of North American Free Trade Agreement have had a significant impact on many industries. Which tax and policy changes could transform your business environment?

- **Lobbyists:** Every trade association and most large companies use lobbyists to scan the legislative and regulatory arena and alert their clients to critical events. Those with autonomy and a strong power base can have a huge influence on new policies. The negotiation of new Medicare drug benefits, for example, had tremendous implications for pharmaceutical companies in the United States, and lobbyists were actively involved in their design.

We should think of influencers as information aggregators and magnifiers: their voices are respected, their opinions are often sought, and they are not shy about exercising their authority.

**In Closing**

The role of today’s leaders is twofold: to pose the questions that focus organizational scanning on important areas, and to assemble the resources required for ongoing active scanning. A few general principles serve as a guide:

- **Actively manage the process:** Active scanning begins with the guiding questions that tell the organization which specific zones of the periphery it should look at most carefully. This can help to focus attention and resources on those areas of the periphery that are most important.

- **Use multiple methods:** The key to active scanning is to avoid the overreliance on the methods and information sources that everyone else uses. To gain fresh insights, we must go beyond seeing what others see. Because each of the methods discussed in this article gives only partial and imperfect insights, it is important to use multiple methods.

- **Commit to scanning:** Once various active scanning methods have been chosen, there must be an organizational commitment to follow through. The pivotal questions will be, (1) How much should we budget for ongoing information collection? (2) Who will collect, collate, and feed information to the interpretation process? and (3) Who will review and act upon the results?

In the end, the meaning of any weak signal detected at the periphery depends upon the position and strategy of the company viewing it. We suggest that firms start with a broad view of the possibilities for scanning and then focus in on the zones that are most significant to their business. 

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*Peripheral Vision: Detecting the Weak Signals That Will Make or Break Your Company* (Harvard Business School Press, 2006), he is also director of the Emerging Technologies Management Research Program at Wharton. *Paul Schoemaker* is chairman of Decision Strategies International. The co-author of *Peripheral Vision: Detecting the Weak Signals That Will Make or Break Your Company* and *Profiting from Uncertainty: Strategies for Succeeding No Matter What the Future Brings* (Free Press, 2002), he is the research director of the Wharton School’s Mack Center for Technological Innovation and an adjunct professor of Marketing at Wharton.

A longer version of this article appeared in the November/December 2007 issue of Marketing Management, published by the American Marketing Association.
“There exists what I call a ‘depth deficit’ in business thinking today – a lack of careful attention to bold, imaginative thinking using rich customer information.”

- Gerald Zaltman, p.89
What is ‘lateral thinking,’ and why is it such an essential practice for business leaders?

Lateral thinking is an operational skill for developing new ideas. It is a deliberate form of idea creativity, based on an understanding of how the brain works as a self-organizing information system. The mind makes asymmetric patterns, and lateral thinking is a way of cutting across patterns laterally, rather than moving along them sequentially.

Today the tendency is to believe that ‘information is enough,’ and you just input your data into the computer and let it do the work of setting your strategy and making your decisions. That’s very dangerous. Think of what happened in China 600 years ago: the scholars started to believe you could move from certainty to certainty, and they never developed the aptitude for speculation or imagination. As a result, progress came to a dead end. Without lateral thinking, you’re stuck in the concepts of the past. When a computer processes
information, its analysis is in terms of existing preferences and past concepts. You need to develop new ways of looking at information.

Perception is 90 per cent of thinking; the rest is fairly routine and automatic. If you’re going to make genuine progress, you’re going to have to do more than just respond to existing data. Interestingly, the business community is more interested in thinking than any other sector of society. In other sectors – political, academic – it’s enough to prove verbally that you are right. In business, you can prove you’re right verbally and go bankrupt the next month.

Unfortunately, many business leaders are still rather complacent when it comes to exploring new and better ways to exercise their leadership. Many CEOs resemble a fellow who’s jumped off the top of a building; as he passes the third floor, he says, “So far so good!” Well, he may be right – it is so far so good, but the future is not so good.

Unless the leadership of a company is motivated to promote creativity, it just doesn’t happen. For example, there was a fellow in Argentina who ran a textile company that was half the size of its nearest competitor. He decided to teach my methods to his workforce, and today, six years later, he’s ten times bigger than his nearest competitor.

The great thing about lateral thinking is that anyone can do it. It doesn’t require that you drop your existing intellectual strengths, just that you add to them. It’s rather like if you’re playing poker and someone comes along and says, “You’re playing a wonderful game of poker, and now I think you should add the skill of bridge.” It’s not stopping what we’re doing; it’s doing what we do best and then adding some other skills.

Look what’s happening in Japan. In the past few decades, it has done very well economically by drawing upon certain intellectual resources. More recently, there’s been an attempt in that country to cultivate greater creativity and innovation. I once had a long discussion with Sony founder Masaru Ibuka, and he was in total agreement with what I was saying about lateral thinking: it is becoming an essential skill in the modern economy.

**Is lateral thinking the same as creative thinking?**

In the English language, creativity is an inadequate word. If you create a mess, you are creative. We also don’t distinguish between artistic and idea creativity, which are very different. When I coined the term lateral thinking, it was to answer the need for a word that was specifically concerned with idea creativity, with changing perceptions and the way we look at things. Lateral thinking also comes from the exploration of asymmetric patterns, where we want to move laterally, across patterns, rather than up and down them.

**Much of your work draws upon your background in Psychology and Medicine. What insights have you gained from this unique approach?**

My background is in Medicine, and in the course of my studies, I dealt with complicated systems such as the organs, circulation and respiration, and analyzed how each of these systems interacted. At that time, I started developing ideas on self-organizing systems, and applied those ideas to the neuro-networks in the brain. That led to my book, _The Mechanism of Mind_, which was read by one of the world’s leading physicists, Professor Murray Gell-Mann, who received the Nobel Prize for his discovery of the quark. He liked the book and commissioned a team of computer experts to simulate my hypotheses. Their experiment was successful, and he’s been on board ever since. From that basis, I went on to design tools and methods of thinking. From the beginning of human existence, philosophers have just used words and descriptions to describe human thinking. Now, for the first time, we have begun looking directly at the information system of the brain, and work forward from that to design ways of thinking. From this foundation, you can move in many different directions. The possibilities are endless.

**You have said that a fundamental problem with corporate decision-making is ‘muddled thinking’: groups are ill-equipped to deal with conflict, and group discussions are often dominated by naysayers. What are some methods to make the decision-making process more productive?**

It was in response to the challenges you describe that I developed the Six Thinking Hats method, which provides a more effective method of group decision-making than mere argument and discussion. In a normal discussion, if someone is against an idea, he or she will stick to their guns and the
We need perceptual thinking, creative thinking and design thinking, and all of these are not part of our traditional system of logic and analysis.

decision-making process will come to a halt. When the Six Hats method is used, that person is challenged to see value in an opposing position, which I call ‘wearing the yellow hat.’ If a person cannot see value in another position, and everyone else can, that person is seen to be limited, even stupid. In the Six Hats approach, you are asked and challenged to operate your brain fully, from many perspectives, so just to stick in one position means you’ve failed.

Why do you feel the Six Hats method has been so widely accepted?
I look at it the other way around: why have we been content with argument for 2,400 years, when it’s such a silly and inefficient system? With the Six Hats, everyone uses their full brain power to explore a subject, rather than just committing to a single point of view. In the U.S., they did a pilot project using juries in court, and found they reached unanimous decisions very quickly using the Six Hats. In some states, including Wisconsin and Massachusetts, the judge can now ask that a jury be trained in the method.

Last year, I was speaking with Nobel Prize-winning economist Joseph Stiglitz, who told me he saw the Six Hats being used at a top economic summit in Washington, DC. More recently, a woman approached me in Auckland, New Zealand, and told me she was teaching the method in the highlands of Papua New Guinea. I am extremely pleased that this approach is being widely used.

You’ve said that disagreements over corporate strategy often stem from a clash of values, rather than from logical contradiction. In what ways is ‘values assessment’ an essential tool for corporate decision-making?
Values are key. In one of my recent books, Six Value Medals, I look at six different types of values, such as human, organizational, ecological or conceptual. If you have a clear scan of your values, then you can look at decisions and decide which course of action best suits your needs: ‘If we’re putting a high value on that consideration, then this is the right decision. If we’re putting a higher value on something else, then it’s not the right decision.’ By having values as a visible ingredient, one can more easily discern why a decision is made and what effect it’s going to have.

How do paradox and humour help with decision making?
Humour is an example of how the brain can switch perception; paradox provides a different way to look at things; and there is also the lateral thinking tool of ‘deliberate provocation.’ These tools allow us to escape from our normal thinking. Normally our thinking is like a doctor in a clinic: a child comes in with a rash, and the doctor examines him, does some tests, and says, ‘This is measles.’ Once the doctor can identify and recognize the sickness as measles, then she knows the standard treatment to apply. Most of our thinking at universities and business schools is concerned with recognizing standard situations and providing standard answers. I have nothing against this approach, but it’s not enough: we need the type of thinking involved in design and creativity. The question is, how can we design the way forward and design opportunities?

You’ve covered a wide range of topics in your 30-plus years of writing. What subjects are currently on your radar?
The next book I’m going to write asks why the world is so poor at thinking. Our current logical system is excellent, but it’s not enough. Unfortunately, the very limitations of our thinking system prevent us from seeing its weaknesses. It’s as if you have a chef who can cook the best omelette in the world; you can’t say the food is bad, because it’s not, but that chef is limited. We need perceptual thinking, creative thinking and design thinking, and all of these are not part of our traditional system of logic and analysis.

The world continues to suffer through conflicts, famine and poverty, despite all of our discoveries and technological advances, so there’s clearly something wrong with the way we’re currently approaching these challenges. Fortunately, things are beginning to change. For example, the Chinese government is starting a pilot project with my work in five provinces, and if they like the results, they’re considering expanding the program to four million schools. In two decades, we may have four hundred million Chinese who can think better about the world around them. So I remain optimistic.

Edward de Bono is a leading authority on the teaching of lateral thinking, a concept he pioneered. A psychologist and physician, he has had faculty appointments at the universities of Oxford, London, Cambridge and Harvard, and has consulted with corporations including IBM, DuPont, Shell, Ericsson, McKinsey and Ford. De Bono has published 75 books in 37 languages, including Lateral Thinking: Creativity Step by Step (Harper Perennial, 1970) and Six Thinking Hats (Key Porter, 1981).
You have done extensive research on 'thinking styles.' How do you define this term?

Simply put, a thinking style is a way of thinking. It is not an ability to think, but rather a preferred way of using the abilities one has. In my research I have found that what happens to us in life depends not just on how well we think, but also on how we think. People think in very different ways, and they overestimate the extent to which others think like they do. As a result, misunderstandings often develop. That's why it's so important to recognize and understand different styles of thinking and learning.

Describe your Theory of Mental Self-Government.

The forms of government that exist in the world are not accidental: they are an external reflection of what goes on in people's minds. Governments serve three functions: executive, legislative and judicial. The executive branch carries out the initiatives, policies and laws enacted by the legislative branch, and the judicial branch evaluates whether the laws are being carried out correctly. The idea behind my theory is that just as governments have to govern nations, people have to essentially govern or manage themselves, and they must perform these same three functions in their own thinking and working.

'Legislative' thinkers like to create their own rules, come up with new ideas, and do things their own way. They prefer problems that are not pre-structured. Some of the occupations these people prefer are creative writer, scientist, artist, sculptor, investment banker, policy maker and architect. The legislative style is particularly conducive to creativity. Unfortunately, school environments do not often reward this thinking style. For instance, a person might find himself in a Science course, required to memorize facts and formulas; but real-life scientists almost never have to memorize anything.

The second style of thinking is the 'executive style.' People who think this way like to be told what to do and are very good at following instructions. They like to work within a framework that someone else creates, and fill in gaps within existing structures rather than create the structures themselves. Occupations that can be a good fit for executive thinkers are certain types of lawyers, police officers, builders of other people's designs, soldiers, and administrative assistants.

The third style, judicial thinking, is more judgmental and evaluative. People who think this way like to compare the value
of things that already exist. They enjoy writing critiques for instance, giving opinions or evaluating programs. Preferred occupations for this style of thinking are judge, arts critic, program evaluator, consultant, admissions officer and systems analyst.

You believe that today’s schools and organizations value certain thinking styles more than others. Which style do they value most?
In my experience, schools often shortchange the legislative and judicial styles and favour the executive style of thinking. Teachers set a framework, and students try to figure out what the teacher wants to hear from them. If you look at standardized testing, it’s more of the same: multiple-choice testing clearly benefits executive thinkers. The problem is that once you get out of school, being exclusively an executive-style thinker doesn’t serve you too well. As you advance into higher positions, the legislative and judicial styles become increasingly important. So the irony is that our schools set you up for success in entry-level positions, where basically you have a boss telling you what to do, and you do it. As you move up, you need to become more of a legislative and judicial thinker, but because you weren’t prepared for this, you may actually encounter the so-called ‘Peter Principle,’ where people get people promoted to a level of incompetence. It’s not necessarily that they can’t do the job, it’s that they were educated and socialized in a way that is a mismatch for the kinds of thinking styles they now need. Ideally, we should be teaching and assessing a variety of thinking styles.

Do most of us default to one of these three styles of thinking?
People don’t have just a single style, but rather a profile of styles. For example, I like to be creative in my work and in many aspects of my life, but put me in a kitchen, and I would prefer to be told what to do. I believe the most powerful approach is to be flexible – to be able to adopt any of the three styles as the situation calls for it. People who can do this develop a sort of ‘meta-style’: they know what a given situation calls for and are able to adapt their thinking to fit it.

The development of our thinking styles is affected by many variables, including culture, gender, age, parenting style and schooling. Which represents the greatest threat to the flexibility of our thinking?
The greatest threat to flexibility in our thinking is entrenchment. That is, as we all become more expert, more educated and more experienced in our jobs, we get used to doing things in a certain way. As the world changes and the needs of business change, we keep doing things the way we’ve always done them – not because it’s the best fit to current circumstances, but rather because that’s the thing we know how to do. Too often, we are rewarded for doing things the way we always have.

As we mature, the biggest threat actually comes from within, and that is our belief that because we are more ‘expert’ and more senior, whatever we are used to doing must be great, because that’s what got us to where we are today. We did a study where we looked at bridge players, and we found that as they became more expert, of course they became better at the game, but if you made a change in the nature of the game – a deep structural change that affected the basic rules – the experts had trouble adapting. In fact, they had more trouble adapting to the changes than did the novices. Often, your own expertise can get in your way.

How do you define ‘successful intelligence’?
Successful intelligence is an ability to achieve your goals in life, given the environment in which you live, by capitalizing on your strengths. It’s about making the most of what you’re good at, leveraging your talents, and compensating for your weaknesses. It involves not only modifying yourself to suit the environment (‘adaptation’), but also modifying the environment to suit you (‘shaping’) and sometimes, finding a new environment that is a better match for your skills, values or desires (‘selection’).

Achieving this requires a balance of analytical, creative and practical abilities. Analytical skills are those primarily measured by traditional tests. Success in life requires one not only to analyze one’s own ideas and the ideas of others, but also to generate ideas (creative abilities) and to persuade others of their value (practical abilities). All of these skills are modifiable; that is, we can improve our abilities. Anyone who is in an administrative position, such as I am, knows that the hardest part of such a job is not coming up with ideas, but persuading others of their value and then effectively executing them.

A last element of effective leadership, which goes beyond successful intelligence, is wisdom: you need the wisdom to ensure that the ideas you pursue are for a common good – not just for your own benefit (or the benefit of people like you, or members of your social or economic class) – that as a leader, you’re truly doing what is best for multiple stakeholders as much as for yourself.

According to your Investment Theory of Creativity, to a large extent, creativity is a decision. Why would someone decide not to be creative?
People do it all the time – though not necessarily consciously. The reason we decide not to be creative is twofold. The first part is external pressure. Creative thinkers are willing to defy the crowd. Metaphorically, they decide to ‘buy low and sell high’ in the world of ideas. It’s like being a value investor in the realm of ideas, and that isn’t easy; because whenever you defy a crowd, you tend to arouse antipathy from others. It’s sometimes referred to as the ‘tall poppy phenomenon’: if there’s only one tall poppy in the bunch, it tends to get cut off to match the others. The second reason creative thinking is hard is because you start putting pressure on yourself. If other people react as if
It's not that people can't be creative; they just often decide that it isn't worth the cost.

your idea is sort of crazy, you begin to think, ‘maybe there really is something wrong with me’ – and you start pressuring yourself to conform. So it’s not that people can’t be creative; they just often decide that it isn’t worth the cost.

According to your theory, creativity requires six distinct but interrelated resources. What are they?
The first is intellectual skills, and three are particularly important: the creative skill to see problems in new ways and to escape the bounds of conventional thinking; the analytic skill to recognize which of one’s ideas are worth pursuing and which are not; and the practical-contextual skill to know how to persuade others of the value of your ideas. The confluence of these skills is key. Second is knowledge. On the one hand, you need to know enough about a field to move it forward, but on the other, you must decide not to let your past knowledge become a hindrance rather than a help. Third is thinking style. I’ve outlined three key ones above, and legislative thinking is particularly important for creativity. Fourth is personality. Certain personality attributes are important for creative functioning, including a willingness to overcome obstacles, to take risks, and to stand up to conventions. Fifth is motivation: intrinsic, task-focused motivation is essential to creativity. If you aren’t truly interested in something, you won’t likely be very creative. And last but not least, you need an environment that is supportive and rewarding of creative ideas. Without that, one’s creativity might never be displayed.

Discuss how our ability to cope with novelty affects our thinking.
The ability to cope with novelty is particularly crucial in the world today, because things are changing at such a phenomenal rate. It’s probably fair to say that there hasn’t been a time in history when things have been moving quite as fast as they are now. Our level of knowledge doubles every few years. So people who can’t cope with novelty — who get comfortable with doing things a certain way — will lose out, and their companies will cease to be successful after a while. In terms of the kinds of assessments we do of people — whether they be prospective students or new hires — I would much rather that we concentrate on saying, ‘is this someone who can cope with a novel environment, who can handle rapid change?’ rather than simply, ‘has this person learned a lot of factual stuff in school?’

What steps can people take to move towards successful intelligence?
There are three things you can do. One is to do a very realistic assessment of what your goals are, because successful intelligence is about achieving your goals, and too often we take on goals that aren’t really our own: they are goals that someone else sets for us, or that we think we should have. So we can easily end up on the wrong track, and once you’re on the wrong road, it can be hard to get back to the right one. So the first thing is to do a realistic appraisal of your goals, asking, ‘Am I going where I want to go? Am I in the right career? Am I framing my life in the right way?’

The second thing is to realistically appraise your strengths and weaknesses and accept that no one is good at everything. Even the people who make it to the very top of an organization aren’t good at everything. If they’re effective, they understand what they do well and try very hard to leverage those strengths. A lot of people fail, not because they don’t leverage their strengths, but because they don’t understand their weaknesses. If you look at failed U.S. Presidents, they tend to be people who get into scandalous situations because they didn’t understand their own weaknesses — whether it’s for people of the opposite sex or for money or power.

The third thing is to ask whether you’re really allowing yourself to adapt to novelty as the world changes: are you getting too comfortable with the way you do things, or are you always open to learning new things? Do you listen to the advice of others, particularly people who are subordinates of yours? Very often, the youngest and newest people in an organization bring in the freshest ideas and have a certain flexibility that we all start to lack if we’ve been in a position for a while. So it’s about being open to new ideas and directions, and being consciously aware that doing that takes real effort.

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ARE YOU A MANAGER OR A CHEF? Think about it.

Picture a restaurant kitchen on a busy Saturday evening. It’s a hubbub of noise, clatter, shouts, flying utensils, spilled sauces, broken eggshells. For those unfortunate individuals who have to clean it up afterwards, it’s a nightmare: it’s a mess.

Now switch to the average corporate boardroom. What comes to mind is just the opposite: a mahogany table, middle-aged men and women in dark suits, white shirts, writing pads in neat leather binders, Mont Blanc pens, open laptops, quiet, polite discussion.

Mess gets a bad rap in business. Yet mess, I’d like to submit, is good. Designer and professor Horst Rittel once claimed that many problems facing society are ‘wicked.’ As distinct from ‘tame’ problems, wicked problems are difficult to define. These are problems that involve tradeoffs between multiple stakeholders and which can never really be ‘solved’ in the sense of finding an optimal solution; they can be seen as symptoms of other problems, and each one is essentially unique. As an example, because there is no real consensus on what constitutes success in the field of socio-economic development, projects in this arena are ‘wicked’; the same goes for urban renewal or curriculum design in public schools.

Wicked problems cannot be solved through linear methods. The standard approach to problem solving proceeds by understanding the problems, gathering information, analyzing information, drawing conclusions and developing solutions. This is fine for tame problems that can be clearly defined and simplified. For wicked problems, however, this process doesn’t work, because wicked problems are ill-defined and require an in-depth understanding of their context.

Contemporary business problems are often wicked. In effect they are social problems that affect multiple stakeholders, with each attempt to create a solution changing the nature of the problem. Customers are messy: they all want different things, and what they want varies from occasion to occasion. Heck, they often don’t even know what they want. And colleagues are messy. Working in teams means accepting different perspectives and valuing the ideas of others. Yet in most business schools, students learn how to solve ‘tame’ problems, not wicked ones. They learn to ‘tidy up’ where they should actually learn to be messy.

By contrast, designers, long accustomed to dealing with mess, have developed several ways of thinking that help them understand such problems without glossing over their essential complexity. In contrast to the analytical perspective often taken in business, where issues are narrowed and key variables isolated from each other, designers dive deeply into a problem, think broadly about it in context and generate new possibilities.

Designers excel at framing and reframing problems and in collaborating with others to develop solutions. User-centred designers make users the core of the design process, and some even bring users into the design process. Diversity in teams enhances the process because the more diverse the team, the broader the range of experiences it can offer. Designers learn to think of issues as a system of interacting parts rather than a
set of independent components, and use structured processes to generate ideas in their teams.

The design model’s ability to address messy problems makes it an attractive idea for business. For business students, exposure to these methods not only prepares them to be superior managers, but pushes them to question their basic assumptions about problem solving.

Educating students to be ‘business designers’ means helping them to frame, deeply understand and solve messy problems. In a design course I taught recently in Austria, I worked with students in applying a design-based innovation process to an art gallery, a zoo and a financial service. The process involved provisionally identifying the problem to be solved, conducting ethnographic research and developing solutions. However, the students learned more than just a design process: they learned that problems are often not what they seem to be, and that uncertainty is not to be avoided, but welcomed. For many, this was not merely a new skill, but a profound personal transformation.

A diagram of the process the students followed is given in Figure 1. While the diagram appears quite neat, the process is certainly messy in practice. The messiness comes from the realization that the problem is not what it appears to be: after an initial statement of intent – a summary of what they were trying to accomplish – students took a deep dive into the customer, business and technological aspects of their problem, using a variety of thought tools to help them make sense of the information. Invariably, they found they had to rewrite their statement of intent at least once before proceeding to develop solutions, an experience that was both frustrating and enlightening.

One team embarked on a project to develop a financial service for students. The team’s early thinking was to provide easy credit for students and, thinking they had solved the problem, they learned everything they could about student credit. But it soon became clear that this was not such a tidy issue. It emerged from the team’s ethnographic research that Austrian students were very reluctant to take on debt, however easy or inexpensive it may be: they would rather live with their parents or on very tight budgets. By this time, the team was
already moving on to implementation plans for their easy-credit scheme, and this revelation came as a major setback – in effect redefining the project.

Instead of wanting easy credit, students needed to learn how to obtain grants, budget their limited funds and manage their finances. They were overwhelmed with information – but the wrong information. This created an entirely different kind of opportunity for the team, and after many iterations between proposed solutions, customer research, brainstorming and refinement, they developed an information clearinghouse that provided financial advice and connected students with services they needed.

For the students, the lesson was not to rush to a solution, but to understand the problem deeply first. One student wrote as follows about the experience:

The redefinition of our research question helped us to focus the problem. I learned that the right question can help me to understand the problem and to focus on the main points. Each redefinition made us get two steps ahead.

Another source of messiness was the diversity of the students in the teams. In the Austrian course, students came from very different backgrounds; there was a mix of men and women from urban and rural areas and with very different interests – one student had been brought up on a farm, while another played guitar in a rock band – and there were several exchange students from different parts of Europe. In addition to language barriers, there were gaps in cultural understanding between several of the students. At times, these gaps led to misunderstandings and tension within the project teams.

Digging deeply to resolve these problems, students found that the empathy they were developing with users could also be applied to their colleagues. By conducting ethnographic research, they had learned to listen and suspend judgment. Now they used these same skills to hold back from criticizing each other’s ideas. With a new, tolerant atmosphere in the groups, ideas began to flourish.

Although the design process was highly structured, making sense of all this mess did not mean trying to tidy it up. Conventionally, students learn to solve problems by dividing them into separable elements and analyzing each element separately. But because changing one part of these problems affected all the other parts, the students had to keep the truly complex interactions of all the elements in view, and to do so, they needed to represent the problems in all their messiness.

The students used several tools for this, but perhaps the most dramatic was developing prototypes of the customer experience. Using scissors, tape, glue and magazines, they were encouraged to make a mess – as indeed they did – to draw out further insights about their innovation. Visual representation of the project brought out ideas that went beyond words and helped the teams communicate with each other:

It is important to be able to express the thoughts and emotions not only with words, but even with pictures and other creative techniques because not every feeling can be expressed only with a word. Only if there is something your colleagues can touch, can they start to understand the meaning of the idea.

For business students accustomed to ‘tidy’ theories imparted by well-dressed professors in orderly classrooms, this tactile approach was new and inspiring. The classroom became a busy kitchen – a hub of activity, noise and creation.

But beyond the fun was a serious lesson: that uncertainty in problem solving is not to be feared, but welcomed. The initial frustration students felt gave way to a realization that their final ideas were much more robust as a result of their willingness to suspend judgment and work with half-formed ideas. This gave them a new-found confidence in their ability to solve any problem that came their way.

Some have suggested that the MBA should become an MBD: Master of Business Design. But perhaps an even better idea would be MBM: Master of Business Mess. As every chef knows, you can’t make an omelette without breaking a few eggs. 

David Dunne is an adjunct professor of Marketing at the Rotman School of Management. He received the University of Toronto’s President’s Teaching Award for 2007.
AT THE ROTMAN SCHOOL’S Designworks Lab, for the past year and a half we’ve been putting our theories into practice, and have witnessed first-hand the power of design-inspired methods to not only open minds, reform habits, and tune up team productivity, but also to deliver high-potential solutions to organizations.

Our goals at Designworks are to help integrate design methods and mindsets into the planning and development practices of a broad base of organizations; to contribute to important step-change strategies for these enterprises; and to groom a new generation of ‘design thinkers and doers’ in the field of business design.

Combining the efforts of our students and graduates with faculty, practitioners, and forward-thinking sponsors, we are finding that the potential for a design-driven process to fuel a new culture of innovation and problem-solving is unlimited. For those engaged in the process, the ‘design experience’ has led to personal growth and transformation; for the organizations involved, it has unleashed new high-potential strategies for generating new value and competitive advantage.

Projects have spanned a range of sectors and subjects, covering wireless, wellness, and waste management. In the last six months alone, full-scale research projects have included:

• The Hospital Experience: designing the patient experience for a new chemotherapy treatment centre (Princess Margaret Hospital);

• Bikes: designing an integrated marketing blueprint for the global growth of a high-end bike company (Cervello Bikes and leading design firm Continuum);

• Economic Clusters: building a sustainable, integrated model for regional clusters in Mexico, engaging a broad consortium of artisans, producers, project managers and government sponsors (Cocomacan Group and the NorthSouth Project);

• Heart Failure Management: reframing the puzzle of managing patients in a complex and erratic ‘pinball’ process, and defining strategies and priorities to deliver better outcomes (Medtronic).

Together, these projects have produced a consistent pattern of outcomes for both students and sponsoring organizations. Collectively, they have revealed the potential of the design-based approach to shape both minds and solutions in virtually any sector.

Our approach

The Designworks approach draws on the principles and tools used across many design disciplines, including Engineering, Architecture, and Industrial Design. Ours is a team-based practice that thrives on the diversity of perspectives and skills within the team. While the precise tools vary from one project to another – there is no ‘plug and play formula’ for effective business design – every project operates within Designworks’ Three Gears of Design (see Figure 1):
Gear 1: User Understanding
Immersion in the human factor is Job One. Empathy and deep human understanding is the foundation for all development. This includes the central stakeholder (i.e., the consumer/customer or patient) and all other stakeholders influencing success (e.g., external partners, retail partners, all medical professionals, staff). The aim is to discover and articulate the underlying needs and motivations of the stakeholders and consider their mental models in the final integrated solution. The emphasis is not on statistical data or the reading of reports: energies are focused on face-to-face, in-depth, open-ended inquiry, leading to a deeper understanding of stakeholder needs and motivations. Because of the personal (versus statistical) nature of the first phase, team members develop a profound appreciation for the ‘whole person’ in a way that creates empathy and the ‘human motivation’ for innovation and value-driven problem-solving. As one student put it, “It’s important to form relationships in your mind with the stakeholders before you can really create a meaningful connection and value.” That means getting very ‘micro’ before pulling back on the connections across stakeholders.

Gear 2: Concept Visualization
Imagine possibilities and then build them out. Open-minded exploration of possibilities and iterative prototyping enables the team to consider a wide range of new ways to meet needs. Hundreds of ideas are generated within teams and with clients, then clustered into themes and transformed into integrated solutions and experiences. They are prototyped into tangible low-resolution prototypes for feedback, user evaluation to fully develop rich and novel solutions. Early in the process, no idea is dismissed, nor any concept expressed in a ‘precious state.’ Ideas are not described in a document; they are built, leaving less room for interpretation and more room for productive dialogue on how to fully form the concept. Storytelling demonstrates the seamless user experience within the multi-dimensional solution that incorporates places, objects, communications, people and services. Through this process, we move from playful finger-painting to a masterful expression of an integrated solution, from abstract ideas to a solution that can be seen and ‘felt’ – physically and emotionally.

Gear 3: Strategic Business Design
Ground solutions in viable business models and actionable strategies. Strategic business design applies creativity and conviction to business modeling, seeking ways to deliver seemingly ‘impossible’ solutions in a viable, sustainable manner. This stage translates envisioned solutions into actionable business strategies and embeds new solutions into current operating models. To do this, we map business models as a set of interrelated strategies and activities, always asking ‘How does this fit into and leverage our current capabilities? What new capabilities do we need to develop, either internally or in partnership with others? What conflicts or tensions do we need to resolve to create a new sustainable model which will transform realities into the foundation of the current model?’ Lastly, we map a path by which an enterprise can begin today to evolve to an enhanced future state, because big ideas take time, energy and discipline. There are no spreadsheets; no eloquent strategy documents. This is a stripped down visualization of the interrelated components of a tight strategy for success – a critical step in translating concepts into clear, actionable strategies and priorities. It’s the difference between an idea that ‘floats’
and a solution that 'lands' and gets acted upon.

Unlike a more conventional approach to strategy and opportunity development, this approach can transform the way individuals think and teams produce results. It leverages, challenges and enhances essential Integrative Thinking skills on many levels. The intense and relatively accelerated ‘design path’ moves the creators between ambiguity and clarity, anxiety and comfort, personal reflection and team celebration.

What we are finding is that the design experience ‘tunes up’ both the individual and the team in the following ways:

1. It leverages analytical skills, ambition, diversity within teams, and project management skills and innate curiosity. All of the good skills and inherent qualities of the individual team members are leveraged in the design process.

2. It challenges the closed mind, the need for certainty in early stages of exploration, fear of failure, and any tendency for narrow perfectionism and incremental thinking. The design process pushes people outside their comfort zone, creates destabilizing uncertainties and lack of control at times.

3. It enhances team collaboration, empathy with others (team members or stakeholders), conflict resolution (people or issue-based), creative problem-solving and comfort with ambiguity at stages when ‘closing in’ would shut down the path to discovery of bigger opportunities and resolution of underling conflicts.

Without a doubt, the design approach is more challenging to mindsets and engrained behaviours than a more linear, conventional approach; but it can also yield greater outputs and, when practiced over time, can transform individuals and organizations in a way that rejuvenates their personal agility and collective ability to produce better outputs faster. The experience develops the ability to navigate opportunity and thrive in a constantly-changing landscape.

End results
The student and graduate ‘design minds’ that we have worked with to date will tell you that they have been transformed, and I have personally witnessed their eyes light up at new possibilities. In Norman Doidge’s world of ‘neuroplasticity’, we provide the impetus for ‘the brain that changes itself.’ In the words of Oliver Wendell Holmes Jr.: “A mind stretched to a new idea never goes back to its original dimensions.”

The ultimate proof is in the outcomes. Designworks projects have resulted in the reframing of high-value opportunities, delivering:

- **A deeper, more holistic understanding of the central stakeholder**, shifting from statistics and habits to needs and motivations. For example, by focusing on the needs of a cancer patient and their broader experience within the cancer treatment journey, the hospital now has a well-defined portrait of the many types of patients who rely on their services, and a broader view of how to better serve that patient beyond high-end capital expenditures. This understanding will inform important management strategies, as well as the day-to-day acts of every staff member.

- **Strategies to deliver better value by expanding into adjacent services and features.** In a commercial context, this means opportunities for high growth and enhanced
Rotman Adjunct Professor Heather Fraser is the director of Designworks and the Rotman Business Design Initiative, initiatives of the Desautels Centre for Integrative Thinking. Designworks offers a number of ways for students and industry to engage in business design, including Executive Education programs and workshops, curriculum-based projects, summer internship projects and commissioned research projects. For more, visit www.rotman.utoronto.ca/businessdesign

competitive advantage. A comprehensive reframing of opportunities for the organization and their partners opens up new possibilities outside the ‘obvious’ advances, like making a better product. New opportunities come from incorporating elements outside the current system of activities, including adding services, partnerships and capabilities that surround and support a great product offering.

• **Broader integration of the needs of all stakeholders into the final solution.** Only by ensuring that key elements of the solution will motivate and engage all stakeholders will significant success be realized. For example, in the heart failure project, solutions centered around the patient knitted together the needs, motivators and unique contributions of all stakeholders: the general physician, the emergency room staff, the cardiologist, the nurse, the internist, sub-specialists and support groups. By finding the leverage points within this network of professionals and supporters, empowering them through better knowledge and management tools, they can now all contribute to a system that generates better outcomes for the patient.

• **Clarity and alignment on vision and priorities.** The overarching vision of possibilities combined with a clear strategic plan provides a roadmap for the organization. In the case of Princess Margaret Hospital, the reframing of opportunities created a clearer picture of what would create meaningful value, revealed important new project opportunities (example: the ‘treatment chair’ in which some patients currently spend up to eight hours of ‘lost time’), and pushed projects up the priority list. This reframing can also point to eliminating initiatives for which the expenditure of effort and money would create lesser value. In all cases, there was a clearer sense of where and how to invest resources.

• **An inspiring vision and a renewed sense of purpose.** When all stakeholders contribute to building the solutions, the final output is both inspiring and motivating as it brings together human considerations, higher ambitions and the collective strengths of the organization and its partners. With a renewed sense of purpose as the foundation, an enterprise is poised to invest time and money on the activities that will bring the greatest return in both human and economic terms. As one of our participants from Princess Margaret said, “This project has given us focus, an action checklist, and a way of prioritizing. It gives us a guideline for ongoing planning and a brief for architects, IT, communications and staff. It will be the basis for all decisions going forward. For all new projects, we will ask: does it meet the patient’s needs? Does it really count?”

While the front end of any design intervention is only the beginning in the process of building-out and evolving an enterprise, the initiatives we have undertaken at Designworks indicate that the ‘design approach’ involves much more than just creativity and collaboration. When considered as a discipline that requires the effort and attention required of any other practice, it offers an effective means to define high-potential strategies for creating greater value, setting priorities within the landscape of opportunity. In the end, this approach offers individuals and teams a way to tune up their Integrative Thinking and generate meaningful advances for their enterprise.
Questions for:
Ellen Langer

The Harvard psychologist and artist on how ‘mindfulness’ can improve your work – and your life.

Interview by Karen Christensen

You have said that “as we learn to see, we learn to be blind.” Please explain.

What I meant is that our expectations lead us around in life, more than we are willing to admit, and they tend to determine what we ‘see.’ The more tightly we learn what something ‘should be,’ the more sure we become of it, and the more difficult it becomes to notice slight deviations. Let’s say you’re approaching a stop sign: after a while, you just see ‘red’ and ‘octagonal,’ and you presume that it means ‘stop.’ The problem is that if that sign suddenly said something entirely different – like ‘danger ahead’ – you would be blind to that. I once did a study where we gave people an index card that said, “if you can read read this correctly, I’ll give you a dollar.” Every single person skipped the double word. They just did not see it. I call this being ‘mindless.’ When we are in this state, the past is determining our present; we see what we expect to see without realizing that there is any choice to be made. The worst part is,
Most of us confuse the stability of our mindsets with the stability of the underlying phenomena.

We're oblivious to how much of the time we are mindless. Most of us confuse the stability of our mindsets with the stability of the underlying phenomena.

You believe that this state of 'mindlessness' is pervasive today, and that it limits not only our capacity for innovation, but for health and happiness. How so?
The research I've done over the past 30 years indicates that most of us, most of the time, are mindless, and the consequences are enormous for every aspect of our health and well-being. I've done studies where we've taught elderly people how to be more mindful, and they live longer. In the business world, mindlessness affects things like innovation—which is really just another code word for being mindful. If you learn information mindlessly, then you won't have it available for creative use: it just doesn't occur to you that any of the individual parts could possibly be rearranged.

For example, at one time, people saw tissues as being 'white.' Of course, there is no good reason why a tissue has to be white. But when the Kleenex people drew up the concept tissue, it was white, so it never occurred to most people that it could be any other colour. Mindlessness is very different from stupidity: it's not like if people actually thought about it, and somebody asked them, 'is it possible to produce tissues in other colours?', they wouldn't know that the answer is 'yes.' The problem is that when you're in a mindless state, this type of thing just doesn't occur to you; and if these things don't occur to you, then it's next to impossible to be innovative.

A related concept in Psychology is 'automaticity' ['the ability to effortlessly complete everyday tasks without conscious thought to step-by-step process.' Is this what lies at the root of mindlessness?
It is true that automaticity is one form of mindlessness; but mindlessness is much more than automaticity, in the same way that a square is a parallelogram, but a parallelogram isn't necessarily a square. The way behaviour becomes automatic is through repetition. Most of us have had the experience of doing something that we do regularly and realizing, later, that we were on 'automatic pilot' while we were doing it. But we can also become mindless upon initial exposure to information. For instance, whenever we read or hear something and accept it without question, we are being mindless. By taking in that initial information as if it is necessarily true, you make what I call a 'premature cognitive commitment': you commit yourself to the meaning of that information before you consider how it might otherwise be used. Let's say when you're young, you make a cognitive commitment to the idea that 'being old equals being forgetful.' When you become old and you start to forget things, it doesn't occur to you to consider any other reason why you may have forgotten something: maybe you didn't get as many reminders as the next person, or maybe you were busy when you heard about it; but if you're not aware of your premature cognitive commitment to an idea, it never occurs to you that there is another alternative.

Describe the opposite state of being: mindfulness.
Mindfulness involves actively drawing distinctions and noticing new things. It demands that we give up the fixed ways in which we've learned to look at the world. When you notice new things, it automatically puts you in the present: it makes you sensitive to context and perspective. The more we notice, the more we become aware of how things change depending on the context and perspective from which they are viewed. When we are mindful, our behaviour becomes rule-guided rather than rule-governed: we may still be guided by rules and routines, but we stay sensitive to the ways our situation changes. When we are mindless, we are trapped in rigid mindsets, oblivious to context or perspective.

No matter what you are doing, you can do it either mindfully or mindlessly. This is true whether you are hanging out with your pets, playing with your children, eating lunch, engaging in conversation or working. The experience of being mindful is a feeling of engagement, and it's what everybody wants to achieve—to feel passionate about what you're doing at that moment, to enjoy it. When people are at play, they are often mindful, but unfortunately, all-too-often they learn their jobs mindlessly. That's why so many people suffer boredom or feel a lack of control at work. If they had learned different aspects of their job mindfully, at every turn there would be choices to be made. Choice-making is very rewarding for people: in general, we like choices, and we run from doubt. But the fact is, you can't have choices unless you also have doubt. So the bottom line to a lot of this is that rather than running from uncertainty (which is inescapable anyway), we should embrace it.

You're a big believer in the power of uncertainty.
Most aspects of our culture lead us to try to reduce or eliminate uncertainty. We learn to do so in order to know what things are, so that we can control them. Instead, we should consider
Is there a cure for mindlessness?
Yes: mindfulness! To become mindful with respect to something that you’ve already learned mindlessly is not easy. That’s what my book On Becoming an Artist is all about. But when you begin some new creative task – whether it be art, music, sports, gardening or cooking – you can throw yourself into it so that you can experience what it means, what it feels like to be mindful. The moment you don’t feel that way about anything in your life, a bell should go off that something needs to change.

As I said earlier, when we’re mindless, we’re not aware of it, so you can’t just change from one state to the other; but you can begin a transition from mindlessness to mindfulness. Learning something new in a mindful way involves retaining some uncertainty – being aware that the understanding you have taken on is based on a particular context, a particular view; and that it may change; and because it may change, the next time you are in that situation, you had better pay close attention. We don’t pay close attention when we think we ‘know’ something. This is why so many marriages go bad, because people get bored – they think they ‘know’ how things are and they stop discovering, just like with the stop-sign example.

When you’re learning something new, the idea is to learn it conditionally: that’s mindful learning. The example I use in my book is art, but it could be with anything, so long as it is something that is new to you. If it’s new, then you’ve got an opportunity to approach it mindfully from the beginning. You want to not be evaluative. People are evaluative all day long: they compare themselves to other people; they compare themselves with their past or ideal selves. At every turn, we evaluate what we’re doing, how well we did it, and so on, and what people need to recognize is that evaluations exist in our heads – they are not ‘in’ the thing that we are evaluating. Once you recognize that whether something is ‘good’ or ‘bad’ is a matter of opinion, it’s easier to go forward and be innovative. If you’ve got an absolute standard, it’s very easy to fall short of it. If you look at the art world, many of the works that people pay millions of dollars for today were largely rejected in their time.

Discuss the ‘tyranny of evaluation.’
Evaluation is the most important roadblock to overcome to achieve mindfulness. The most common reason we hesitate when presented with the opportunity to express ourselves creatively is our fear of other peoples’ negative opinions. Evaluations work just like rules: they dictate our responses. When we make or accept evaluations, we hold the world still, and that’s mindless.

When we’re young, we are ruled by evaluation: in school, we must be quiet, and we cross the street only if the light is green. As we get older, the rules become less clear, which can make us hesitant and more vulnerable. We frequently (and mindlessly) hold on to value judgments that we have attached to various events, objects and states of the world, even though the world is not fixed. While we acknowledge that there are two sides to every coin, we tend to treat things as either ‘good’ or ‘bad.’ A more mindful approach would entail understanding not only that there are advantages and disadvantages to anything we may consider, but that each disadvantage is simultaneously an advantage from a different perspective (and vice versa). With this more mindful approach, virtually every unpleasant aspect of our lives can change for the better.

You believe that mindlessness is ‘visible’ to others. Please explain.
Those around us can sense when we are being mindless. We did a study with dolphins, where we instructed the trainers to be either mindless or mindful: the mindless group was told that when they were in the water, they should just think of all the things that they are certain of with respect to dolphins; and the mindful group was told to think about how the particular dolphin they were interacting with is special or different from all the others, and how that particular dolphin is different from the last time the trainer interacted with it. When we released the dolphins into the water, they swam faster to get to the mindful trainers, and they stayed with them longer. We’ve done similar studies with children and adults. In the adult studies, when we had people selling a product mindfully, not only did they sell more of it, but when we questioned the people they had sold to, they said that the mindful salespeople were more charismatic.

Can mindfulness improve the quality of our decisions?
Definitely. Most of us move through the day without recognizing the alternatives we have and actively deciding among them. As a result, we give up the feeling of control and mastery that would be ours if we were to mindfully create options for ourselves. I suggest people approach all situations as opportunities for mindful decision making. Mindful decision makers never worry about making the ‘right’ decision, because they realize there is no single right decision to be made. Whenever we proceed with certainty, we are being mindless, and we wind up engaging in behaviour that becomes self-confirming.

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What are heuristics?

A synonym for heuristics is ‘rules of thumb’: heuristics involve using short cuts to make a decision, rather than following a rational, step-by-step, analytical process where we assign values to each step and then calculate ourselves toward the right choice.

Heuristics have been traditionally seen by psychologists and organizational theoreticians as a bad thing, or at least as inferior to the pure-calculation method. Many people are now re-evaluating that judgement and saying, “Heuristics is how we work and make decisions in real life.” The notion of simple guiding principles, which I’ve helped develop with David Oliver [of HEC Montréal], is a helpful kind of heuristic. These are shortcuts, based on our experience and what we intuitively feel is right, that are valuable in making decisions.
How can thinking about thinking lead to better decision-making?
The kind of decision making that interests me is the kind that comes from within. It’s a situation-specific and concrete kind of thinking, and it’s about taking what you have inside and getting it out of you and onto the discussion table. That kind of thinking is often difficult to accomplish in a calculative and algorithmic way, and it’s here that heuristics, such as those involving simple guiding principles, can really help. They put you back in the realm of authenticity and engagement.

The fact is, people use heuristics whether they want to or not. Rather than forcing people to speak cautiously at the strategy meeting, and hold back what they know and feel, it’s better to create a context in which people feel safe and secure enough to bring their experiences and ideas to the table.

Your emphasis on subjective knowledge in shaping business strategy might seem surprising to those more used to focusing on hard facts and the bottom line. In which ways is strategy a living, creative and human practice, rather than an objective one?
Over the past few decades, many attempts have been made to use Natural Science to deal with strategy and other organizational problems and processes. When I argue for strategy as a living, creative and human practice, I’m often challenged by those who state, “There are numbers and objective facts that you cannot argue with: they are undeniable.” Yet we all know that even numbers and facts are themselves malleable and not particularly objective.

Whenever you’re dealing with people, you inevitably have to deal with subjectivity. This is the limit to using the Natural Science paradigm in the Social Sciences. Whenever you have people interacting, which is the essence of any organization, you should expect to be surprised and to find yourself going beyond the objective plan.

What are some practices that can help managers to ‘think from within’, and find inspiration and creativity in the strategy-making process?
I’ve found that one of the most essential practices in a successful strategy session is to take the time to warm up. Warming up is something of a lost art. When we watch athletes preparing for a match, what do we see them doing? They stretch and jog around before launching themselves into the competitive arena. In the same way, people often meet for a drink and socialize before going to dinner. That’s the warming up activity that’s so forgotten in serious management practice, because it’s not seen as connected to efficiency and effectiveness.

In Psychology, the importance of proper preparation has been recognized for almost a century, the belief that you need to establish a certain comfort level before going deeper into a person’s thoughts and feelings. Warming up could be something as simple as walking around the table and stretching rather than immediately sitting down and pulling out the PowerPoint presentation. You could go further and use your hands to construct things, or play with metaphors, or even role play and change your context, that is, remove yourself to a different physical environment. All these techniques are extraordinarily useful.

Action-oriented managers usually want to quickly move ahead, and can be found looking at their watches and declaring that time is running out. Instead of rushing, I try to slow things down, taking half an hour for warm-up exercises alone. I find that participants react very positively and in a totally different way once they are properly prepared for the challenge of talking and doing.

You’ve stated that, to be most effective, heuristics should not be purely rational; they should also take account of our emotional selves. How can the emotions be properly harnessed to further the aims of the organization?
The French philosopher René Descartes is famous for his pure rationalism and for arguing for the separation of mind and body. What is less known is the writing he did at the end of his career, including the work *Les Passions de l’âme*, or ‘The Passions of the Soul’, where he pointed out that the mind and body might not be so inextricable after all. His thoughts were influenced by the signals he was receiving from various parts of his body, including hunger and fatigue, and by such emotions such as anger and love. He reversed what has been called the ‘Cartesian error’ by acknowledging that his emotions and physical stimuli exerted a strong pull on his thoughts.

I think most people, from a psychologist to the average layperson, would support Descartes’ latter position and agree that our thoughts are inextricable from the rest of our physical and emotional selves. The question is then how to harness the emotions and the rest of our being to the benefit of the organization.

One important step is to make sure that people feel that the organization’s aims are theirs as well. Ways to do so include involving workers in the formulation of organizational goals.
Achieving coherence in the face of complexity entails discovering how to get things done in a meaningful way in an environment where there are many unknown factors. and authentically listening to each person's point of view, with the possible end of adjusting those goals. Another technique comes to us from the ancient Greeks and the Romans, and involves the art of persuasion. Through rhetorical techniques, we can hone the shape and nature of our arguments to make them more convincing. We can, in fact, use any technique, depending on the situation and the people involved, except intimidation. If we’re asked by our workers, “Why should I do this?” and our answer is, “Because I say so,” then we have used intimidation and we have failed.

Over the past few years we’ve heard a lot about the need for companies to become more innovative and flexible. Yet despite a steady supply of new jargon, models and techniques, the practices by which most companies create strategy have by and large not helped them become more prepared for the unexpected. What are they doing wrong? My answer here is short and simple. A lot of the work in the strategy realm helps for the everyday and the short term. From the budget to the action plan, the focus is primarily on the expected. It’s easy to be stuck in the present and to pay attention to what you see, rather than what you don’t see. Where I think companies can do better is to focus on being mentally even more prepared for the unexpected, that is, on what they don’t know. Incidentally, one of the best ways to do this is to play, which I’ve elaborated in my book Thinking from Within.

These days, the biggest challenge for business leaders involves achieving coherence in the face of complexity. What are some simple principles that managers can put in place to achieve what you call a ‘unified perspective’?

Achieving coherence in the face of complexity is simply discovering how to get things done in a meaningful way—in a way that everybody involved finds meaningful—in an environment where there are many unknown factors and it’s difficult to predict the future. The first principle in achieving coherence is to ‘know thyself.’ Unless you know who you are as a unit or a company, you will have trouble moving together in the same direction. This is what’s often missing in strategy groups, where we love to work toward the future and talk about vision and mission, instead of talking about who we are.

A second principle is to ensure you have some principles before you rush into action. Before forging ahead with an action plan, ensure that your actions occur within an ordered space, guided by a few principles that you share in the team and the organization, again based on who you are.

A third principle involves genuine understanding and involvement, which is a process issue. Establishing your goals as an organization is important, but people must also truly understand the nature of the organization. In my experience, you can challenge a management team at the start of a strategy session to define the company—rather than the company’s goals—and discover that each person has a different idea about what the company is all about.

We’ve all heard the truism that ‘95 per cent of strategy is execution.’ The phrase assumes that those at the top know what to do, and if there’s a problem, it lies with those lazy souls who are charged with the implementation. I like to challenge that notion by asking, ‘If I were someone responsible for the implementation of this strategy, what might my objections be? Why might I resist doing what you want me to do?’ The question often triggers some honest responses, such as ‘Maybe I don’t like the strategy. Maybe I don’t like you. Maybe I don’t get it. Maybe I have another agenda.’

A large percentage of strategy is surely about execution, but there are ways to tilt the process and do better preparatory work to get people involved before the implementation stage, rather than simply telling them to ‘execute or be executed,’ as the phrase goes.

What’s next on your research agenda?

I recently published another book called Everyday Strategic Preparedness: The Role of Practical Wisdom in Organizations, in partnership with my ex-colleague Max Statler. It’s a short book, quite philosophical, really something of a thought piece. Ironically, it’s the book that should have come before Thinking from Within, because it explains why it’s so important to prepare for the unexpected and why we’re suggesting certain thought processes—rather than how—to accomplish these aims, which is the subject of the earlier work. R

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Studies show that when our thinking is challenged, we tend to resist, and that this intensifies if we are forced to reconsider not only what we think but how we think. Why is this?

‘What’ we think about occurs at a conscious level, where critical, fair play can occur more readily. But how we think occurs at an unconscious level – much like how we walk; it involves habits of mind, and thus is not readily inspected in the way an opinion, belief, or fact might be consciously examined.

The problem is, this relative lack of access makes it difficult for us to appraise and alter how we think where necessary.

Habits of mind are developed and reinforced over long periods of time and across a wide variety of circumstances. Their neural underpinnings are characterized by much stronger associations than exist for the thoughts on which they operate. In effect, we are more strongly ‘addicted’ to how we think than we are to what we think about. Having said that, habits of mind are unavoidable, and they usually work for us rather than against us. The challenge is to understand what they are, so that when they aren’t working in a particular situation, we have some idea as to what needs to change.

A whopping 95 per cent of our thinking takes place in our unconscious mind. What are the repercussions for business people?

There are several. First, managers must become familiar with the ways in which the unconscious mind operates – things like the role of emotions in decision making, the reconstructive nature of memory, how deep metaphors function, and so on. Second, research tools must be developed that enable the exploration of the unconscious mind. And third, managers must use this knowledge and these tools in ways that are both effective and socially appropriate. In short, it requires a very different approach to tuning-in to consumers’ minds than is widely practiced today.

You have said that 80 per cent of all market research serves mainly to reinforce existing conclusions rather than to develop new possibilities. Why is this?

Human beings possess a natural ‘confirmatory bias’: they are more concerned with establishing whether a particular idea is ‘good’ or ‘bad’ than with finding out what good ideas might exist, which is the realm of exploratory research. This confirmatory bias surfaces in various ways, including which ideas are selected or not selected to test or evaluate, how questions are framed, and how data is analyzed. Some of this is driven by
Managers must become familiar with the ways in which the unconscious mind operates: the role of emotions in decision making, the reconstructive nature of memory, and how deep metaphors function.

This is the topic of my new book. We are all born with certain capacities, such as those for language, social attachment, emotion, and so on, and one of these capacities involves the ‘viewing lenses’ we place on things. These are ways of seeing the world that shape our thinking and behaviour by adding to, subtracting from and otherwise changing information we acquire and use. I call these lenses ‘deep metaphors’: they are deep because they are unconscious and powerful, and they are metaphors because they involve a representation of things. We always see things from ‘somewhere,’ and deep metaphors are that somewhere.

It turns out, empirically, that there are only a small number of basic deep metaphors, just as there are a small number of basic emotions (fear, joy, sorrow, anger) underlying a huge number of different feelings. Of course, environmental factors – especially social environments – create a good deal of variation in how a given deep metaphor is expressed.

Can you give us an example of a deep metaphor?
There are seven main ones, which my co-author and I cover in depth in the book: transformation, journey, balance, container, connection, resource and control. I’ll describe one of the more complex ones, ‘container.’ Containers do two basic things: they keep things in and they keep things out. They can protect us or trap us. They can be open or closed and positive or negative. They involve physical, psychological and social states. For instance, we find ourselves ‘in’ or ‘out’ of physical shape; ‘in’ a good or bad mood; stuck ‘in’ a rut; unable to break ‘out’ of a habit. We want to take time ‘out’ or get back ‘into’ an activity or relationship; we feel vulnerable or snug and secure; empty or fulfilled. We store up our money, energy and goodwill. Memories are one of the most vital containers of all, because they literally store our lives and identities.

Can you give an example of a deep metaphor such as this being used in the business world?
A recent example involves the hearing aid firm Oticon. They developed a considerable technological advance in hearing aids, but they knew that technical attributes alone would not win them customers. They discovered that the deep metaphors of ‘connection’ and ‘container’ influenced consumer thinking about hearing aids; these were the viewing lenses people used when they encountered technical product information. With the ‘container’ metaphor, people felt trapped or caged as a result of their hearing loss, which led to...
a sense of disconnection from their social world. In terms of the ‘connection’ metaphor, people felt stigmatized by wearing a hearing aid, which further distanced them from the people around them.

In its advertising, Oticon addressed both of these deep metaphors by showing a stylish-looking hearing aid escaping from a bird cage, with the caption, “Set yourself free: nothing should hold you captive, not even hearing loss.” The ad also suggests how the hearing aid can be used almost as an accessory, with different colors to blend with one’s hair or skin tone and to express individual style. They do refer to the technological advances in the ad, but they really stress the social and psychological importance of particular elements and how they relate to the user’s life values and goals.

You believe that most business thinking is stuck in the equivalent of ‘the shallow end of the pool’. Please explain.

There exists what I call a ‘depth deficit’ in business thinking today. By this I mean a lack of careful reflection and bold, imaginative thinking using rich customer information. For example, many managers still think about their offerings solely in terms of product or service attributes and their functional consequences or risks and benefits. These elements are all important, of course; but they reside at the shallow end of the pool of possible thinking. They fail to take into account the socio-emotional consequences of these risks and benefits which, of course, are what makes them relevant to customers in the first place. Moreover, they fail to consider why the social and psychological consequences themselves are important – how they relate to the basic values and goals of the customer. These elements constitute the deep end of the pool. Once in the deep end, it is necessary to develop a coherent story, a web of meaning that integrates these different levels of understanding or thinking. A story that only consists of product or service attributes is a pretty shallow story, and is unlikely to engage customers.

What initial steps can we take to overcome the deficits in our deep thinking?

In the last chapter of How Customers Think, I detail several tools that people can use to help them think more deeply – I call them ‘crowbars for creative thinking’, and they include things like: ‘ask generic questions’; ‘avoid premature dismissal’; and ‘get outdated.’ But these approaches assume that managers already have the appropriate information to think about. My latest book argues that for successful deep thinking, the critical first step is knowing what is going on in your customer’s unconscious mind – knowing which deep metaphors are operating. Only with these insights in hand can a manager begin to exercise her own imagination and anticipate new solutions for her customers. Only then can she provide them with ‘gifts’ that they had not previously been able to request because they couldn’t articulate them, or didn’t realize they were possible. So the first-step question should be, do you know what your customers’ deep metaphors are?

For successful deep thinking, the critical first step is knowing what is going on in your customer’s unconscious mind. The question is, do you know what your customers’ deep metaphors are?

Do you see enough examples of people attempting to make it to ‘the deep end’?

Deep thinking is hard work. It is not accomplished simply by pouring over memos and reports, participating in lots of meetings and conference calls and logging long hours at the office. It requires the use of disciplined imagination applied to deep insights from customers. There are plenty of people who are quite bold and imaginative in their thinking and risk-taking. When you’re working with someone from another company or team, you tend to get a feeling pretty quickly as to, ‘this would be a fun and stimulating group to work with,’ or ‘God help me, what a bunch of drudges.’ You get a feel for the intellectual chemistry or dynamism of people and whether they’re going to be comfortable going into the deep end. There are plenty of people who are truly inquisitive and motivated to take this journey.

Is it more or less difficult for large companies to get to the deep end than it is for smaller firms?

In my experience, I don’t see any difference. I find a big company is really just a collection of many small organizations, and some departments or teams can be really quite imaginative and willing to stretch their thinking, while others are not – regardless of the size of their firm.

Your work indicates that Psychology is one of the most important aspects of business, and yet it’s not a subject that is taught in most business schools. How do you feel about that?

I do believe that Psychology is important, but it is no more or less important than a number of other disciplines. My PhD is in Sociology, so clearly I think it is important too. The good news is that Psychology and other disciplines are now introduced in business schools in particular courses – not yet as a core subject matter, but many schools do a decent job of introducing psychological and other behavioural disciplines into the curriculum. Could they do it more thoroughly? Absolutely.

HOW SHOULD DECISIONS BE MADE?

Easy, we figured that out long ago: first define the problem, then diagnose its causes, next design possible solutions, and finally decide which is best. And, of course, implement the choice.

But do people always make decisions that way? We propose that this rational, or ‘thinking first’ model of decision making should be supplemented with two very different models – a ‘seeing first’ and a ‘doing first’ model. Healthy organizations, like healthy people, have the capacity for all three; and when managers use all three, they can improve the quality of their decisions.

How should decisions be made? Sometimes decisions defy purely step-by-step logic. To be effective, people should also embrace intuitive or action-oriented forms of decision making.

The Limits of ‘Thinking First’

Years ago, one of us studied a host of business decisions, delineating the steps and then laying them out. A decision process for building a new plant was typical: the process kept cycling back, interrupted by new events, diverted by opportunities and so on, going round and round until finally, a solution emerged. The final action was as clear as a wave breaking on the shore, but explaining how it came to be is as hard as tracing the origin of that wave back into the ocean.

Often decisions do not so much emerge as ‘erupt.’ Here is how chess master Alexander Kotov has described a sudden insight that follows lengthy analysis:

“So, I mustn’t move the knight. Try the rook move again... At this point you glance at the clock. ‘My goodness! Already 30 minutes gone on thinking about whether to move the rook or the knight. If it goes on like this you’ll really be in time trouble.’ And then suddenly you are struck by the happy idea – why move rook or knight? What about B-QN1? And without any more ado, without analysis at all, you move the bishop. Just like that.”

Perhaps, then, decision making means periods of groping followed by sudden sharp insights that lead to crystallization; or perhaps it is a form of ‘organized anarchy,’ as Stanford professor James March and colleagues have written. They characterize
decision making as “collections of choices looking for problems, issues and feelings looking for decision situations in which they may be aired, solutions looking for issues to which they might be an answer, and decision makers looking for work.”

But is the confusion described by these authors in the process, or is it in the observers? Maybe messy, real-life decision making makes more sense than we think, precisely because so much of it is beyond conscious thought.

Seeing First
Insight – ‘seeing into’ – suggests that decisions, or at least actions, may be driven as much by what is seen as by what is thought. As Mozart said, the best part about creating a symphony was being able to “see the whole of it at a single glance in my mind.”

So, understanding can be visual as well as conceptual.

In W. Koehler’s well-known 1920s experiment, an ape struggled to reach a banana placed high in its cage. Then it saw the box in the corner – not just noticed it, but realized what could be done with it – and its problem was solved. Likewise after Alexander Fleming really saw the mold that had killed the bacteria in some of his research samples (in other words, when he realized how that mold could be used), he and his colleague were able to give us penicillin. The same can be true for strategic vision. Vision requires the courage to see what others do not – and that means having both the confidence and the experience to recognize a sudden insight for what it is.

A theory in Gestalt psychology identifies four steps in creative discovery: preparation — incubation — illumination — verification. Preparation must come first. As Louis Pasteur put it, “Chance favors only the prepared mind.” Deep knowledge, usually developed over years, is followed by incubation, during which the unconscious mind mulls over the issue. Then with luck, there is that flash of illumination. That eureka moment often comes after sleep – because in sleep, rational thinking is turned off, and the unconscious has greater freedom. The conscious mind returns later to make the logical argument. But that verification (reasoning it all out in linear order for purposes of elaboration and proof) takes time. There is a story of a mathematician who solved a formula in his sleep. Holding it in his mind’s eye, he was in no rush to write it down. When he did, it took him four months!

Great insights may be rare, but what industry cannot trace its origins to one or more of them? Moreover, little insights occur to all of us all the time. No one should accept any theory of decision making that ignores insight.

Doing First
But what happens when you don’t see it and can’t think it up? Just do it. That is how pragmatic people function when stymied: they get on with it, believing that if they do something, the necessary thinking could follow. This is experimentation – trying something so that you can learn.

A theory for ‘doing first’, popularized in academia by organizational-behaviour professor Karl Weick, goes like this: enactment – selection – retention. That means doing various things, finding out which among them works, making sense of that and repeating the successful behaviours while discarding the rest. Successful people know that when they are stuck, they must experiment. Thinking may drive doing, but doing just as surely drives thinking. We don’t just think in order to act, we act in order to think.

Show us almost any company that has diversified successfully, and we will show you a company that has learned by doing, one whose diversification strategy emerged through experience. Such a company at the outset may have laid out a tidy strategy on the basis of assessing its weaknesses and strengths (or, if after 1990, its ‘core competencies’), which it almost certainly got wrong. How can you tell a strength from a weakness when you are entering a new sphere? You have no choice but to try things out. Then you can identify the competencies that are really core. Action is important; if you insist on ‘thinking first’ and, for example, doing formalized strategic planning (which is really part of the same thing), you may in fact discourage learning.

Making Decisions Through Discussion, Collage and Improvisation
Thus the three major approaches to decision making are thinking first; seeing first; and doing first. They correlate with conventional views of Science, Art and Craft: the first is mainly verbal (comprising words in linear order), the second is visual and the third is visceral. Those who favour thinking are people who cherish facts, those who favour seeing cherish ideas, and those who favour doing cherish experiences.

For many years we conducted workshops on the three approaches with mid-career managers. We would begin with a general discussion about the relationship between analysis, ideas and action, and it soon became evident that practicing managers recognize the iterative and connected nature of
Being able to see a trajectory – having a vision about what you are doing – energizes people and stimulates action.

these elements. We would then ask small groups to discuss an issue for about an hour (one of their own or else what we call a ‘provocative question’ – for example, “How do you manage customer service when you never see a customer?” or “How do you organize without structure?”), and summarize their conclusions on a flip chart and report back to the full group.

Next we would give the groups coloured paper, pens, scissors and glue. Each small group had to create a collage about the issue they discussed in the thinking-first session. At the end of that second workshop, the groups viewed one another’s images and compared ‘seeing first’ with ‘thinking first’ – in terms of both process and results. Finally, each group, with only a few minutes of preparation time permitted, improvised a skit to act out its issue. Again, the groups considered the results.

Reactions to the approaches was revealing. Participants noted that in the thinking-first workshop, the initial discussions started off easily enough, no matter what the mix of nationalities or work backgrounds. Participants listed comments on flip charts and spontaneously used bulleted items and numbers – with the occasional graph thrown in. Almost no time was spent in discussing how to go about analyzing the problem. Groups quickly converged on one of several conventional analytic frameworks: cause and effect, problem and solution, pros and cons, and so on.

Many participants observed that such frameworks, particularly when adopted early, blunted exploration. Quality and depth of analysis may have been sacrificed for process efficiency. Thinking-first workshops encouraged linear, rational and rather categorical arguments. All too often, the result was a wish list, with disagreements hidden in the different points. In other words, there may be less discipline in thinking first than we believe. Thinking comes too easily to most of us.

But when groups had to make a picture, members had to reach consensus. That required deeper integration of the ideas. “We had to think more to do this,” one participant reported. The artistic exercise “really forced you to capture the essence of an issue,” another added. People asked more questions in the seeing-first exercise; they became more playful and creative.

“In ‘thinking first,’ we focused on the problems; in ‘seeing first,’ we focused on the solutions,” one person said. One group believed it had agreement on the issue after the thinking-first workshop. Only when the picture making began did its members realize how superficial that agreement was – more of a compromise. In contrast, when you really do ‘see,’ as someone said, “The message jumps out at you.” But to achieve that, the group members had to find out more about one another’s capabilities and collaborate more closely. “I felt it became a group project, not just my project,” said a participant who had chosen the topic for his group.

The seeing-first exercise also drew out more emotions; there was more laughter and a higher energy level. This suggests that being able to see a trajectory – having a vision about what you are doing – energizes people and so stimulates action. In comparing the seeing-first exercise with the thinking-first discussion, a participant remarked, “We felt more liberated.” The pictures may have been more ambiguous than the words, but they were also more involving. A frequent comment: “They invite interpretation.”

One particularly interesting observation about the pictures was that “the impression lasted longer.” Studies indicate that we remember pictures much longer and more accurately than words. As R. Haber demonstrated in Scientific American years ago, recall of images, even as many as 10,000 shown at one-second intervals, is nearly 98 per cent – a capability that may be linked to evolution. Humans survived by learning to register danger and safety signals fast. Emotion, memory, recall and stimulation are powerfully bundled in ‘seeing first.’

Contrast that with one comment after the thinking-first workshop: “Twenty-four hours later, we won’t remember what this meant.”

In fact, although many participants had not made a picture since grade school, the art produced in the seeing-first workshops was often remarkable. Creativity flowed freely among the managers, suggesting that they could come up with more creative ideas in their home organizations if they more often used symbols beyond words or numbers.

Our multicultural groups may have liked the art workshop for overcoming language barriers, but groups of managers from the same company, country or language group responded equally well. One British participant who was working on a joint venture with an American partner found that out. He met with his U.S. counterpart a few days after the workshops. “We talked past each other for two hours,” he reported. When he suggested they create a picture of their common concerns, they finally were able to connect.

The improvisation skits – ‘doing first’ – generated more spontaneity. Participants responded to one another intuitively
and viscerally, letting out concerns held back in conversation and even in artwork. For example, turf battles become evident in the way people stood and talked. Humour, power, fear and anger surfaced.

Karl Weick has suggested that a key aspect of effective action in organizations is the ability to remain open to signals from others, even under extreme pressure. He believes that such 'heedfulness' is a finely-honed skill among group improvisers such as jazz musicians. Organizations that recognize opportunities for improvisation – and hone the skills required – increase their capacity for learning. In improvisation, people have to respond with a speed that eliminates many inhibitions. “Having to just act gets rid of the fears,” one participant said. Another added, after watching a colleague play the role of a frustrated bank customer, “The output can be scarily real.”

Mere words, in contrast, feel more abstract and disconnected – numbers, even more so – just as the aggregations of marketing are more abstract than the experience of selling. The skits bring out what the words and numbers do not say – indeed, what problems they cause. “Not everything is unsayable in words,” claimed playwright Eugène Ionesco, “only the living truth.” Or as Isadora Duncan, the modern-dance pioneer insisted, “If I could say it, I wouldn’t have to dance it.” Thus ‘doing first’ facilitates the dancing that is so lacking in many of today’s organizations.

**Enough Thinking?**

The implications for our large, formalized, thinking-obsessed organizations are clear enough: not to suspend thinking so much as put it in its place, alongside seeing and doing.

Isn’t it time we got past our obsession with planning and programming, and opened the doors more widely to venturing and visioning? A glance at corporate reports, e-mail and meetings reveals that art is usually something reserved for report covers – or company walls. And when organizations separate the thinking from the doing, with the former coming from the heads of powerful formulatators and the latter assigned to the hands of ostensibly docile implementers, those formulatators lose the benefits of experimenting – and learning.

Each approach has its own strengths and weaknesses. ‘Thinking first’ works best when the issue is clear, the data reliable and the world structured; when thoughts can be pinned down and discipline applied, as in an established production process. ‘Seeing first’ is necessary when many elements have to be combined into creative solutions and when commitment to those solutions is key, as in much new-product development. The organization has to break away from the conventional, encourage communication across boundaries, bust up cerebral logjams and engage the heart as well as the head.

‘Doing first’ is preferred when the situation is novel and confusing, and things need to be worked out. That is often the case in a new industry – or in an old industry thrown into turmoil by a new technology. Under such circumstances, complicated specifications get in the way, and a few simple relationship rules can help people move forward in a coordinated yet spontaneous manner.

This suggests the advantages of combining all three approaches. In order to learn, a group might tackle a new issue first by Craft, which is tied to doing; then, in order to imagine, by Art, which is tied to seeing; finally, in order to program, by Science, which is tied to thinking. In ongoing situations, Art provides the overview, or vision; science specifies the structure, or plan; and Craft produces the action, or energy.

In other words, Science keeps you straight, Art keeps you interested, and Craft keeps you going. No organization can do without any one approach. Isn’t it time, then, to move beyond our narrow thinking about decision making – to get in touch, to see another point of view? R

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**When Each Decision-Making Approach Works Best**

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**Henry Mintzberg** is the John Cleghorn Professor of Management Studies in the Desautels Faculty of Management at McGill University in Montreal. The author of *Managers Not MBAs: A Hard Look at the Soft Practice of Managing and Management Development* (Pearson Education, 2004), he was the first Fellow to be elected to the Royal Society of Canada from the field of Management. **Frances Westley** is the J.W. McConnell Chair in Social Innovation at the University of Waterloo and co-author of *Getting to Maybe: How the World Is Changed* (Vintage Canada, 2007).

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Your book A Whole New Mind makes frequent references to right- and left-brain thinking. What’s the difference between the two, and why is the distinction important for today’s business people?

Over the course of evolution, our brains have done a very elegant job of dividing up tasks. The left side of the brain specializes in tasks that are logical, linear, sequential and analytical, whereas the right hemisphere specializes in understanding things all at once rather than in sequence; in processing that’s about context rather than text; and in synthesis rather than analysis. The truth is, we use both sides of our brain to do everything that we do, but that divide offers us a powerful metaphor for understanding the thinking styles and set of abilities that are going to be necessary to survive and thrive in 21st century labour markets.

Questions for:

Daniel Pink

The best-selling author explains why ‘right-brain thinkers’ will rule the future, and how to survive in ‘The Conceptual Age.’

Interview by Stephen Watt
The abilities characteristic of the left hemisphere, the logical, linear, spreadsheet-type abilities, used to be the ones that mattered most. For the past few decades, we’ve been in the Information Age, the era of the left brain and of what Peter Drucker famously termed ‘the knowledge worker.’ The sort of abilities usually associated with a lawyer, engineer or accountant were all you needed to get ahead.

Today these skills are still essential, but they’re no longer sufficient. We’re now in the early days of the Conceptual Age, in which the central economic figures are artists, designers, inventors, teachers, caregivers, entrepreneurs and big picture thinkers. Abilities characteristic of the right hemisphere – artistry, empathy, inventiveness, integrative thinking and big picture thinking – these are the kinds of abilities that are now determining who moves forward and who falls behind.

The reason has to do with three powerful economic forces: Abundance, Asia, and Automation. This trio is nudging us from one era to the next. To make it today, you have to do something that’s difficult to outsource, hard to automate, and that delivers on the growing demand for non-material things, such as aesthetics, spirituality and emotion. Routine computer programming, accounting, or financial analysis you can ship overseas or reduce to lines of code in software. That’s much harder to do with artistic, empathic, big-picture abilities.

Are there companies that have made the transition to the Conceptual Age?

An obvious example of a big company that has done a great job of moving into the Conceptual Age is Apple. Very tellingly, Apple recently changed its name from Apple Computer to Apple, from an Information-Age to a Conceptual-Age operation. It’s a company that puts a huge premium on design, on creating something new, and on usability, and for the past couple years, it has flourished under that strategy. Meanwhile, the titans of another era, the very left-brain, process-oriented companies like Dell and Microsoft, have been struggling.

Procter & Gamble is another interesting example. P&G is absolutely a commodity business – it’s soap, toilet paper, shampoo and toothpaste – and yet what they have done internally is put a new emphasis on design and innovation under the guidance of their CEO A.G. Lafley.

I would even argue that Google, which we tend to think of as a left brain company, has actually thrived because of some of its right brain features. Google got a hold on the search market because of design. Its interface was better than its competitors, at the stage when people were migrating to the Internet. That simple, elegant, one-page design, with the ‘do you feel lucky’ option, is iconic and helped Google establish a big share of the market among users. Of course, it also did a better job of figuring out the business model and how to make money.

General Electric is another interesting example. Under Jack Welch, the company was process-oriented, Six Sigma, ranking workers and getting rid of them if they didn’t perform. Under Jeffrey Immelt, GE is a very different company. Immelt has done a very nice job of appealing to people’s higher sensibilities. He’s said that if you want to be a great company, you have to be a good company, and that people come to work for GE because they want to be about something larger than themselves. Look at his appeals to eco-imagination: he’s recognized that some of the most talented people out there, especially in Science and Technology, want to be solving the big, tough, public problems, like the need for clean air and water, and renewable energy.

The search for meaning, and the desire to do something significant, is a big part of the Conceptual Age, because people have been liberated by prosperity but not necessarily fulfilled by it. There’s this widespread search, in North America and in most advanced economies, for purpose and significance, and I think you see that bleeding into the business world. Smart business people are recognizing the change and embracing it, rather than running away from it.

In the past, people ‘dropped out’ of the corporate rat race to do what they really loved. What’s the best working environment to keep employees happy and engaged?

There’s no single recipe for success. If you’re talking about universal yearnings, we need to develop work forces built much more on intrinsic motivations than on extrinsic motivations. Extrinsic motivations such as pay and bonuses don’t last very long and they can often backfire. They’re important – I’m not saying to get rid of them – but the most successful workplaces find other ways to motivate their employees. When people are working for an organization because they want to be there, they’re going to stick around and produce more innovation and creativity on a daily basis. At Google, employees can spend 20 per cent of their time working on whatever they want, in other words, whatever they’re intrinsically motivated to do. Google doesn’t sign away the intellectual property rights created during this time, of course. Last year, something like half of its new products were birthed during this 20 per cent time frame.
Google clearly understands the power of intrinsic motivation.

It's also a company that provides space for innovation and creativity. They're providing autonomy, which means not imposing too many rules on people, but rather treating them like adults. They're smart to do so, because it's such a challenge to get people to stick around. Talented people today need organizations less than organizations need talented people. That's a fundamental fact of labour markets. People don't need organizations nearly as much as they did in the past.

As jobs are increasingly automated and outsourced, where does that leave white collar workers whose skills are a better match for the Information Age?

At the individual level, it's important for a worker to develop a whole constellation of abilities that can't be easily exported, replicated or automated. I actually believe that most people have such abilities to some degree or another. They simply haven't used their skills, which have then atrophied as a muscle would, because these skills have never been called 'out of hiding.' People will find that they're actually good at these skills, but uncovering them takes a certain degree of personal responsibility and self-discovery. We heard the same sorts of fears when we moved from an industrial to an information economy. It was thought that many people would be ill-equipped to make the transition. That turned out to be mostly wrong: plenty of people could make the transition, and had in them these basic information-age skills.

It's also a very important policy question. The transition from the Industrial to the Information Age took place over a generation. Parents had the opportunity to transmit a new kind of knowledge and skill set to their kids. Even still, people got left behind, more so in the U.S. than in Canada. That's because we had a policy system that wasn't built to handle the economic transformation: the policy tools were ill-equipped for the problem that was in front of us. Now we have this other transformation going on. It's happening at a rapid pace; it's happening within careers rather than across generations, so it's even more dislocating; and we still don't have the proper policy mechanisms to help people make the switch. So while the transition is partly the individual's responsibility, it becomes doubly hard when governments aren't doing much to help people thrive in the new era.

In A Whole New Mind, you identify six abilities that have become crucial, one of which is design. Why is it so important to think like a designer?

It goes back to the fundamental economic forces at play. Good design is hard – not impossible – to outsource, and hard – not impossible – to automate, and therefore has more value. In a world of abundance like that of North America, where you have more automobiles than you do licensed drivers, where you have a $21-billion self-storage industry because people have so much excess stuff, where material needs have been satisfied and even oversatisfied, the only way for sellers to stand out in a crowded marketplace of products, services and experiences is to appeal to people's aesthetic and emotional sensibilities. That's what designers do. They combine the utilitarian and the significant, the functional and the aesthetic.

As [Rotman Dean] Roger Martin has stated, business people need to think like designers. As the success of Apple and other design-friendly companies has demonstrated, there's a premium on giving the world something it didn't know it was missing. Design has become a fundamental business literacy, and hats off to the Rotman School for figuring this out years before anyone else. It would be unthinkable to have an MBA go into a company or become an entrepreneur and have no idea how to use a spreadsheet. I think it should be just as unthinkable that someone with an MBA entering the business world not be literate in design. It's that important now.

If you were to give somebody just one piece of advice about how to be successful in the Conceptual Age, what would it be?

If I could give two pieces of advice, one would be to be skeptical of self-proclaimed experts peddling advice! The second would be to know yourself, and know your own source of intrinsic motivation. If you know what makes you tick, and you pursue that, then you're going to do well regardless of what happens in the economy.

People who are always looking for what's out there, who just want a bigger paycheque or promotion, or who don't really know what they're about, can get themselves into trouble in a period of economic flux. People who are intrinsically motivated, who do what they want – because they enjoy it, because it brings them meaning, because they think it makes a difference in the world – those people are able to ride out any kind of economic transition. The dirty little secret is that people who prove to be greater successes in the material world are those who are intensely, intrinsically motivated.

What's next on your research and publishing agenda?

My family and I just spent two months in Japan, where I was studying the manga industry – Japanese comics – which is the source of 40 per cent of the printed material in Japan, and is really at the epicentre of Japanese pop culture, (pop culture being Japan's top export.) Next year, I’ll be out with the first business book in manga for a Western audience. It will be a career guide in the form of a graphic novel that tells the story of a character who works at a company: through his trials and tribulations, we will learn the six essential aspects of what it means to have a satisfying and productive career. The following year, I’ll be out with another book, which will be about – surprise! – intrinsic motivation. R

In a recent study you found that ‘cognitive skills’ are literally worth more in large urban areas than elsewhere. Please explain.

Economists have had evidence for some time that in general, skills are more valuable in bigger cities. The problem is that to date, the definition of ‘skills’ has been very broad, because most of the studies have used education-based measures. So for example, researchers have found that having a college degree is more valuable in a big city than in a small one. That’s fine, but we all know that a degree from a good university and a degree from a lower-grade college are very different things: they provide you with very different sets of skills, and even within good universities, the sets of skills that graduates in Engineering get versus the skills that graduates in Literature, Psychology or Economics get is very different.

The question that remained for us was, “which skills are the most valuable in cities?” We set out to answer this question, to gather a new type of data set that would give us an idea of the amount of cognitive skills, social skills and motor/manual skills possessed by different workers, and then we measured which of these skills is the most valuable in bigger cities. As expected, what my colleagues [including Rotman Professor William Strange] and I discovered is that cognitive skills are significantly more valuable in large cities.

What are some of the skills that you place under the ‘cognitive skills’ label?

The term ‘cognitive skills’ covers a wide range of skills. It’s not just mathematical skills that are more valuable in urban areas: general intelligence, verbal skills and language skills are also more valuable, as are reasoning skills and being able to handle complex ideas.

Surprisingly, you found that ‘soft skills’ are equally important in urban areas. What are these skills, and why are they so important in urban areas?

‘Soft skills’ refer to a set of personality traits that characterize people to various degrees. In our work we focused on ‘the
Unlike cognitive and soft skills, we did not find that manual and motor skills are more valuable in cities. So for big cities, public policy that aims to keep manufacturing plants full of blue collar jobs is counterintuitive.

You found that the prices paid to workers for physical labour actually decline with city size. What are the implications of this?

That is true, and it brings me to the third set of skills we studied: manual and motor skills. Unlike cognitive and soft skills, we did not find that manual and motor skills are more valuable in big cities. So for big cities, public policy that aims to keep manufacturing plants full of blue collar jobs is counterintuitive, because these skills are not complementary to big cities. Big cities are expensive places to operate in: the land is expensive, rent is expensive, and if these workers are no more productive in a big city, it doesn’t make sense to keep these jobs there. The bright side is that this gives hope to smaller cities. They should be looking at policies that, for instance, try to attract manufacturing plants, shipyards, assembly lines and other operations that require motor and manual skills.

You found that the Rotter Index’ scores of workers affect their wages. What is the Rotter Index, and why is this?

When you are trying to figure out whether certain skills are more valuable than others in a large city, one key question that you encounter is this: is it really the case that these people’s skills are better paid in a city, or are these people just better at what they do than similar workers in smaller cities? And because we cannot ever measure all of the skills that someone possesses, it may be true that the person is getting paid more because of some other skills we haven’t measured, and we may be attributing it to their cognitive skills and social skills.

We spent a lot of time on this problem. One way of dealing with it was to use some tests that the workers in our sample were subjected to when they were between the ages of 15 and 23 – before they entered the labour market – so we could have a sense of their level of cognitive skills and social skills before they decided what kinds of jobs they would do, where they would live, whether they would migrate to bigger cities or not, etc.

The intelligence test that we used was the Armed Forces Quantitative Test, and the ‘soft skill’ test that we used is the Rotter Test (named after Julian Rotter). The Rotter test attempts to capture people’s beliefs about whether their worlds are controlled by themselves or external factors. Another individual characteristic we can control for is the quality of the university attended by the individual. Some would say that the fact that cognitive skills are better-compensated in large cities may simply reflect the fact that these people went to better universities, and therefore they had better overall skills. But with our data, we were able to say, no, this is not simply driven by the fact that they went to better universities.
Describe the effects of choosing a ‘selective’ University.
What we found is that going to a better university means that you have a better set of skills, in the sense that it translates into higher wages. This is true irrespective of whether you decide to be located in a big city or not. Also, we found that these skills are significantly more valuable in bigger cities than the sets of skills that you would obtain from a less-reputable university.

One of your surprising findings was that overall, big cities are only marginally more skilled than small cities. That is, the overall skill set that exists in New York City is quite similar to that in Sudbury, Ontario. How do you explain this?
Clearly, a city like New York is home to lots of the most skilled workers – lawyers, managers, etc. But when we computed the amount of cognitive, social, and motor skills in New York City, we found that they actually exist in roughly the same proportion as they do in most other cities in the U.S. – and we speculate that the same is true for Canada.

What we are saying is that, yes, New York City does have a lot of the highly skilled, but it also has a lot of the very unskilled. So you might have lots of high-power lawyers in New York, but you also have lots of lawyers who do ‘bread and butter’ law. Moreover, all of these lawyers need admin staff and janitorial staff and, to some extent, gardeners and cab-drivers – and as a result, the city needs manual skills as well. So the proportion of different skills in different cities doesn’t change nearly as much as one might expect. What this suggests is that there is some sort of ‘complementarity’ between the skilled and the unskilled – that for some reason that we don’t yet understand, very highly-skilled workers need to be combined with – to be in close proximity to – unskilled workers in roughly the same proportion in small, medium, and large cities.

In recent years, Canada’s education policy has been skewed towards ‘hard sciences.’ One of your conclusions is that “there is an equally strong case for other sorts of education that stress language and general critical thinking.” Please discuss.

In many countries educational policies have been biased towards the ‘hard sciences’ for quite some time. Our results suggest that this is fine in the sense that these careers require a lot of cognitive skills, which are important for cities and make cities more productive. But our results specifically say that all sorts of cognitive and social skills – not just the math skills that are usually associated with hard-core science – but reasoning and general intelligence and social skills are just as important in cities, and focusing solely on ‘science’ ignores this.

I believe the case for pushing for careers that require both social and cognitive skills is at least as strong as the case for pushing for the hard sciences alone. Our research shows that the set of skills that has become more valuable since the 1970’s in the U.S. economy is a combination of cognitive and social skills: social skills by themselves are not becoming more valuable; and cognitive skills by themselves are becoming more valuable, though not by much; but when you combine the two, this is the set of skills that is becoming significantly more valuable over time. If you want to stimulate a certain type of education to meet this demand, it would be education that provides both social and cognitive skills at the same time.

It sounds like the Rotman School’s focus on Integrative Thinking is in line with your findings.
Absolutely. Integrative Thinking entails the use of multiple skills, including cognitive and social skills: it requires the cognitive skills to build and analyze different models; and it requires the social skills necessary to evaluate the possible effects on diverse groups of stakeholders – customers, employees, competitors, community residents, etc., not just a subset of the above. People with that ability to make connections across knowledge gaps will be more and more valuable – whatever size city they live in. R

Bernardo Blum is an assistant professor of Business Economics at the Rotman School. In addition to his ongoing research, this year he is teaching the core first-year MBA course in Macroeconomics.
ALMOST EVERY DAY, sometimes many times a day, I read an article about some organization or see a company or its leaders in action and exclaim, “What were they thinking?”

It frequently seems as if modern management is something drawn from a Dilbert cartoon, except with serious consequences for both companies and their employees. But organizational leaders are hardworking, serious people, often expending enormous amounts of time and effort trying to do a good job. The problem is not one of intelligence or effort. Why do so many companies and their managers do so many things that seem so incorrect?

In the spirit of the quality movement that has taught us to look for the root cause of problems so they can be fixed at the source, it is important to see what mindsets and behaviours underlie many of the difficulties organizations face. There seem to be three themes that help explain how companies make poor choices:

1. The importance of considering feedback effects – the idea that actions often have unintended consequences;

2. The naive, overly simplistic, almost mechanical models of people and organizations that seem to dominate both discourse and practice; and

3. The tendency to overcomplicate what are often reasonably straightforward choices and insights.

By considering these ideas and their implications, I believe it is possible to come to a better understanding of what to do and make sounder judgments.

1. Feedback Effects
Actions have consequences; decisions have repercussions. When companies do things to people, those people react. In too many situations, problems arise when we don’t think through the likely consequences, repercussions, and reactions.

For example, when many companies get into financial difficulties, the first thing they do is cut wages and benefits. Cutting labor costs by cutting the expense of employees ought to help the financial condition of the organization. But things often don’t work out quite as planned, and the reasons for this can be anticipated.

When I teach executives, I sometimes run the following little thought experiment. I will go up to one and say, “Assume that you work in my company and that you are who you are – a competent, experienced, hardworking, intelligent individual, doing your best to do your job as you think you should. Now I come to you and say, ‘Our organization has fallen on hard times
– which, by the way, may be because of strategic mistakes you had no part in making – and in order to restore profitability and financial viability, we need to cut salaries and other employee expenses such as benefits, by about 25 per cent. How do you feel about this, and what are you going to do in response?"

I have never once had an executive respond by thanking me for making the tough decisions required to keep the organization economically viable. Instead, I typically get one of two responses. The first, often communicated with a reasonable amount of anger and emotion, is that the person is immediately going to look for another job and leave. The second response, if I add that general conditions of the job market preclude such a move, is that he is going to withhold effort and ideas, cut back on what he does, and maybe even find ways of getting back at management by intentionally messing things up.

Note what cutting salaries does beyond the immediate benefits of reducing the wage expense. First, it drives people to leave. And who is most likely to be able to find another job? Usually, the best people – those who have the most skills, experience, and the highest levels of performance. As the best people leave, turning the company around becomes more difficult, because turnarounds require insight and skill, and both are being lost. Second, cutting salaries creates a desire on the part of those who remain to passively (by slacking) or even actively (by sabotaging) harm the company. Such actions, or inactions, obviously make organizational performance worse and improvement in results more difficult to achieve. As a consequence, companies frequently find themselves in a pernicious race to the bottom, to see whether or not they can cut costs faster than the unintended consequences of those cost cuts reduce subsequent organizational performance.

Take another example. Not long ago, the Tribune Company fired the publisher of the Los Angeles Times for the audacity of refusing an order to sack a quarter or more of the newspaper’s newsroom staff. Many newspaper companies seem to have an interesting take on competitive dynamics in the media business and the source of their success. Facing increased competition from alternative news sources, including television and the Internet, their typical response is to cut reporting costs and other editorial expenses. Having cut the number of people who gather and write the news, the companies still have to fill their pages. So, their actions leave them filling up their newspapers with items from standard sources such as news services that can be accessed online or articles from other newspapers.

Consider the San Francisco Chronicle, owned by the Hearst Corporation. A high fraction of the articles in the first two news sections of the typical Sunday paper (and many of the daily papers as well) comes from The New York Times. This raises the question of why one would buy a paper whose quality and uniqueness is declining because of inadequate investment in staff; why not just buy the paper from which the Chronicle gets a lot of its stories and which has invested in its own, unique news gathering and reporting? The point is that the more newspapers cut their quality, the less incentive there is for anyone to subscribe. So subscriptions fall, more cuts are made, and the death spiral continues, if not accelerates. The only thing that can possibly provide competitive advantage in a saturated media marketplace is the quality of the writing and the ideas. An undifferentiated, unoriginal product of low quality is not going to save any company in the newspaper, or for that matter any other, industry.

There are ways to consider feedback effects and their likely results before taking actions. Some sophisticated analytical methods entail building formal models; for instance, as is done in the MIT systems dynamics lab by people such as Nelson Repenning and John Sterman. But it doesn’t require formal modeling or scenario analysis to spend some time thinking about the likely consequences of interventions and taking those reactions into account as companies plan what they should do.

2. A More Nuanced View of What Motivates People and Makes Organizations Successful

The second thing that seems to get companies into trouble is holding and therefore acting on naïve, simplistic, and inaccurate theories of human behaviour and organizational performance.

The prevailing view that seems to form the foundation for many interventions is almost mechanical – if you want employees to do something, they need either positive inducements or threats or punishments, or some combination of these. In the absence of some external force, it seems to be assumed that people would be inert, just like objects in Newtonian Physics, where a body at rest will remain at rest unless impelled by some force into motion.
It doesn't require formal modeling or scenario analysis to spend some time thinking about the likely consequences of interventions and taking those reactions into account.

We know this view of human behaviour isn't true and that incentives and punishments have numerous problems: the use of monetary incentives can decrease or undermine intrinsic motivation, as extrinsic incentives provide a way for people to make sense of doing something without their having to believe that they like it. The attempt to control people's behaviour through rewards and sanctions can engender psychological reactance, a process in which people rebel against constraints on their behaviour – and are driven to do the very things they have been constrained from doing. Incentives are often very blunt forms of intervention, so we sometimes get the behaviour we have rewarded only to discover we didn't really want it. For example, school systems that reward teachers for improving student test scores have sometimes found that the improvement was achieved by various forms of cheating.

Our view of organizational success and where it comes from is also often equally simplistic. We venerate the lowest-cost organizations and admire the largest firms. But in many industries, success goes to the companies that offer the best value proposition, not necessarily those with the lowest costs. For instance, in the grocery store industry, Whole Foods Market is more profitable than its competitors even though many aspects of its business model raise its costs. But people will pay more for food they actually want to eat.

In many industries the most profitable firms are not the largest. Toyota is only now on the verge of overtaking General Motors in sales, but it has been much more profitable for a while. Southwest Airlines has been consistently profitable but it is not the largest airline. And so it goes. If companies act on the basis of simplistic and inaccurate theories of human behaviour and organizational performance, their decisions will not be sound and the results will be poor.

Companies that are serious about overcoming this problem can spend more time getting informed about the facts, about history and about alternative theories of behaviour. Yes, this requires an investment of time and effort. But some forethought and learning can prevent expensive errors.

3. Sometimes the Right Answer Is Obvious

The third problem that seems to get companies into trouble is making things overly complicated. This may seem to be inconsistent with the preceding issue, but it isn't. The fact is that human and organizational behaviour is often quite comprehensible and readily understood, but not by using many of the more conventional and well-accepted perspectives.

For instance, the ‘norm of reciprocity’ is both a simple and powerful idea. It is simple because it means just that favours will be reciprocated and so, probably, will harmful actions. People try to keep their interactions with others in a sort of balance, and don't want to do things for others when those efforts will never be repaid. People are unlikely to be friendly toward those who are unfriendly toward them. The idea is powerful because reciprocity is virtually a universal human norm, found in essentially every society that has ever been examined.

Now consider how the norm of reciprocity might help companies make decisions about managing people. If a company provides training and thereby makes an investment in its people, those people will be motivated to reciprocate through loyalty and effort. If companies provide wages and benefits that are perceived as generous, as being more than what would be required by the market – what economists such as George Akerlof call ‘efficiency wages’ – people will be likely to reciprocate for this generosity through increased discretionary effort and enhanced attachment to those companies. And vice versa. Cutting training and cutting the deal offered to employees is likely to induce reciprocal diminished effort and loyalty on the part of those who see the exchange as unbalanced.

My overall message is that we ought to think before we act, taking into account feedback effects and using the insights of not only the large body of evidence on behaviour but our own common sense and observations. It turns out both common sense and careful thought are in short supply. But that means there are great opportunities for those people and organizations willing to spend the effort to get beyond conventional management wisdom. R

Jeffrey Pfeffer is the Thomas D. Dee II Professor of Organizational Behaviour in the Graduate School of Business at Stanford. He is the author of 12 books, including Hard Facts, Dangerous Half Truths and Total Nonsense: Profiting from Evidence-Based Management (Harvard Business School Press, 2006) and his latest, What Were They Thinking? Unconventional Wisdom About Management (HBSP, 2007), from which the above was excerpted.

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Reducing our Collective Footprint

DESPITE GROWING AWARENESS of the threat of global warming, many individuals feel helpless to avert a climate change crisis, says Dr. Ron Dembo, founder and CEO of Zerofootprint, an environmental not-for-profit. “The question is, what can I, as an individual do? How can I do all these wonderful things – save energy, reduce greenhouse gas, preserve the natural world – and still live a decent life?” On September 12, Dembo presented his company’s contributions to the global debate on climate change in a presentation titled “Everything You Wanted to Know About Carbon Offsets But Were Afraid to Ask”, part of the Rotman Business of Green Speaker Series.

The good news for those concerned about ecological issues, says Dembo, is that, collectively, individuals can make a genuine impact. “If 660 million people changed their screensavers to black, you would save 100 nuclear power plants, or 360 coal-fired generating plants,” says Dembo, who is also the founder and former CEO and president of Algorithmics Incorporated, the risk-management software company, and an adjunct professor at the Rotman School. Zerofootprint, his latest venture, aims to provide individuals and companies with a way to measure and reduce their consumption of natural resources, known as their ecological or carbon ‘footprint’.

One way to reduce one’s footprint is by carbon offsetting, he explained, which may include such eco-friendly practises as the use of public or low-energy transportation, choosing local food, and designing or retrofitting buildings to use less energy. Planting trees is another surefire way of negating carbon consumption. Dembo claims that “over a 50-year lifespan, one tree makes $31,000 worth of oxygen in Toronto, recycles $32,000 worth of water, effects $52,000 worth of pollution control, and controls $31,000 of soil erosion.”

To encourage people to ‘go green’, Zerofootprint has developed a customizable calculator that measures environmental impact in four areas: travel, food, office and home. By combining data across households, companies, neighbourhoods or cities, users can see at a glance which initiatives work best at stemming the consumption of natural resources. Says Dembo, “The market will tell you what works, whether it’s changing a light bulb, creating incentives for public transportation, or installing solar panels.”

Zerofootprint has recently signed up the municipal governments of three cities – Toronto, Seattle, Washington and Boulder, Colorado – to roll out programs to engage their citizens in tackling climate change. The company has also partnered with Rotman Executive Programs to launch a co-branded Zerofootprint/Rotman Calculator that promotes eco-friendly practices at the School and among its staff and students. “Executive Programs staff and students will reach millions of people over the course of their careers. That population is itself a country,” says Dembo. “If everybody in that country reduced their footprint by 10 per cent — which is infinitely achievable — we would make a profound difference.”

The partnership with the Rotman School is part of Zerofootprint’s broader strategy of targeting companies, schools and online communities, rather than national governments. “We live in a time when you don’t need government action as much as you used to,” says Dembo. These notional – rather than national – communities, existing within or beyond national borders, have the power to mobilize positive activity on a massive scale. Says Dembo, “They are countries without borders, and where they lead, the legislation will follow.”

— BY STEPHEN WATT
Roger Martin Named ‘B-School All-Star’ by BusinessWeek

DEAN ROGER MARTIN was recently named one of ten ‘B-School All-Stars’ who are revolutionizing business education by BusinessWeek.com. Martin, who has served as Dean since September 1998, was cited for pioneering a business philosophy oriented around design and Integrative Thinking that encourages managers to become flexible problem-solvers. He was the only non-American and the only current business school Dean to make the list.

Other ‘all stars’ on the list included Harvard Business School’s Michael Porter and Clayton Christensen, Jeremy Siegel of the Wharton School, Steven Levitt of the University of Chicago, and Warren Bennis of the University of Southern California. In 2005 Martin’s teaching also earned him a spot on BusinessWeek’s list of ‘innovation gurus’.

Martin holds the Premier’s Chair in Competitiveness and Productivity and is director of the AIC Institute for Corporate Citizenship at the Rotman School. His second book, The Opposable Mind: How Successful Leaders Win Through Integrative Thinking, was published by Harvard Business School Press in December 2007. Under his leadership, the Rotman School has doubled the size of its graduate and executive programs, attracted leading students and faculty from around the world, and steadily improved its position in prestigious rankings of business schools internationally. The full article is available online at www.businessweek.com/bschools/content/aug2007/bs20070821_430502.htm – BY KEN MCGUFFIN

CMA gift boosts Accounting Programs at Rotman

ACCOUNTING EDUCATION AT the Rotman School received a boost in funding recently with a three-year, $50,000 per year sponsorship commitment from Certified Management Accountants of Ontario (CMA Ontario). The partnership will strengthen academic collaboration and instruction in managerial Accounting.

“The Rotman School is among the best in Ontario and we’re pleased to engage in this partnership,” says Merv Hiller, president and CEO, CMA Ontario. “We think it is important to equip schools with the tools they need to prepare students for the CMA designation. This sponsorship aims to strengthen the important relationship between academics and accounting professionals.”

At a cheque-presentation in October, Rotman Dean Roger Martin echoed the importance of professional designations and CMA Ontario’s support of the Rotman School. “Partnerships with professional associations are an important way for our faculty to connect with current issues facing practitioners, and to prepare students for the rigorous professional designation process,” he said. “The CMA’s sponsorship will allow us to acquire better case material for our Managerial Accounting course and will strengthen the Accounting curriculum.”

The Accounting faculty at the Rotman School and U of T Commerce is divided between the St. George and Mississauga campuses of the University of Toronto. The CMA funding will work on both campuses to provide a 14-session Accounting research workshop series, where academic research papers will be presented and discussed; to provide reading packages and case instruction in Introductory Managerial Accounting courses; and to provide specialized case material in management control.

The Certified Management Accountants of Ontario is a self-governing professional organization that awards the Certified Management Accountant (CMA) designation to qualified candidates in Ontario. With 16,000 certified members and 4,000 student members, CMA Ontario is an integral part of a profession that is 47,000 members strong across Canada and around the world. CMA Ontario maintains rigorous standards of accreditation and professionalism in management accounting to protect the public interest. – BY KEN MCGUFFIN
**Wikinomics Nominated for Best Business Book of the Year Award**

**A BOOK CO-AUTHORED BY** Rotman Adjunct Professor Don Tapscott was recently nominated for one of the world's most prestigious business book awards. *Wikinomics, How Mass Collaboration Changes Everything*, by Prof. Tapscott and Anthony Williams, was named as one of the six finalists of the 2007 Financial Times and Goldman Sachs Business Book of the Year Award. It is a first time that a Canadian has been nominated for the award.

*Wikinomics*, which has been on best sellers lists around the world since its release last year, is an explanation of how internet-based collaboration can be harnessed to produce even more innovative content, products and services. Prof. Tapscott is chief executive of international think tank New Paradigm. Founded in 1993, New Paradigm produces groundbreaking research focused on the role of technology in productivity and business design, effectiveness and competitiveness. He is the author of 11 widely read books about information technology in business and society, including *Paradigm Shift*, *Growing Up Digital* and *The Naked Corporation*. Prof. Tapscott's clients include top executives of many of the world's largest corporations, and government leaders from many countries. He is a frequent lecturer and speaker at the Rotman School.

Other nominees included *The Age of Turbulence* by Alan Greenspan; *Black Swan* by Nassim Nicholas Taleb; *Immigrants* by Philippe Legrain; *The Last Tycoons* by William Cohan (which won); and *Zoom* by Iain Carson and Vijay Vaitheeswaran. Complete details on the awards are available online at: www.ft.com/indepth/bookaward2007. – BY KEN MCGUFFIN

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**Researchers Use Math to Cut Waiting Times**

**NOBODY ENJOYS IT,** but we've all experienced it, whether it's in the hospital emergency room or anticipating that urgently-needed cup of java in the morning: the dreaded long wait. Believe it or not, facility planners care about this too. Their dilemma is how to balance costs for building facilities with minimizing the amount of time people have to wait for a service they have traveled to get.

“You can see it almost any night you go to a hospital emergency – some are going to be overflowing, some are going to be very relaxed,” says Rotman Professor of Operations Management and Statistics Dmitry Krass, one of three authors of a recent paper on the problem. “Some of it is due to changes in demand but some of it is due to the fact that facilities a not planned properly.”

The paper shows how using a complex algorithm developed by Krass and Rotman Professors of Operations Management and Statistics Opher Baron and Oded Berman, who holds the Sydney C. Cooper Chair in Business and Technology, can answer the questions of how many facilities are needed, where to put them and how large they need to be in order to balance consumer demands for low wait times and short travel times with costs.

“If I’m a planner and I am trying to figure out how to locate a facility, I am first trying to identify regions that will generate about the same amount of demand and then I try to figure out how much capacity each region needs,” says Prof. Krass. The algorithm the researchers have developed works by showing how to answer the question of how to spread demand out and what is the minimum capacity the busiest facility needs to provide a reasonable level of service – cutting down on wait times.

The problem with previous attempts at developing mathematical approaches to solving the dilemma – called facility location theory – is that they have used very specific assumptions that have prevented the algorithms from being useful under a variety of scenarios. They also considered only one or two of the three questions considered in the paper: how many facilities are needed, where to put them and how large they need to be.

The end result is, “either you provide lousy service or you pay too much for your facility,” says Prof. Krass. The complete study is available online at: www.rotman.utoronto.ca/pdf/FacilityLocation.pdf. – BY MOIRA MACDONALD
15 New Faculty Appointed at Rotman

A RECORD-SETTING 15 NEW FACULTY MEMBERS have joined the Rotman School for the 2007/2008 academic year, helping to prepare for the continued expansion of the School’s suite of graduate programs. As announced in our last issue, Richard Florida has joined the School as a professor of Business and Creativity and academic director of the newly-established Martin Prosperity Institute. In addition,

• Anita McGahan has joined the School as a professor of Strategic Management. She was previously on the faculties of Boston University and Harvard Business School;
• Sabrina Buti is an assistant professor of Finance with expertise in the areas of corporate finance, market regulation and microstructure.
• Tiziana Casciaro joins the School as an assistant professor of Organizational Behaviour. Previously she was a faculty member at Harvard Business School.
• Assistant Professor of Accounting Gus De Franco was previously at the University of Toronto at Mississauga.
• Sanford DeVoe is completing his PhD at Stanford University and is an assistant professor of Organizational Behaviour. His research interests include decision making and work motivation;
• April Franco joins the School from the University of Iowa as an assistant professor of Business Economics and Strategic Management.
• Nina Mazar is an assistant professor of Marketing with expertise in the areas of consumer behaviour, and behavioural economics. She was previously at the MIT Sloan School of Management;
• Matthew Mitchell joins the School as an associate professor of Business Economics. He previously taught at the Universities of Iowa and Minnesota.
• Claire Tsai is an assistant professor of Marketing with expertise in consumer behaviour. She recently received her PhD from the University of Chicago;
• Baohua Xin is completing his PhD at the University of Minnesota and is an assistant professor of Accounting.
• Min Zhao joins the Rotman School from the University of Florida as an assistant professor of Marketing.

Last but not least, Feng Chen, an assistant professor of Accounting, and Alberto Galasso, an assistant professor of Strategic Management, have joined the faculty at the University of Toronto at Mississauga and will be cross-appointed to the Rotman School; and Esther Eiling is an assistant professor of Finance at the University of Toronto at Scarborough who will be cross-appointed to the Rotman School. – KEN MCGUFFIN

Rotman Professor Appointed to UofT’s Teaching Academy

IN OCTOBER, Rotman adjunct professor of Marketing David Dunne received the University of Toronto’s President’s Teaching Award for 2007. This award recognizes sustained excellence in teaching, research in teaching, and the integration of teaching and research. The 10 winners from throughout UofT have been designated as members of the University’s Teaching Academy for a period of five years, and receive an annual professional development allowance of $10,000 for five years.

Members of the Teaching Academy are called upon to meet on occasion as a body to discuss matters relevant to teaching in the University, offer advice to the Vice President and Provost and the Director of the Office of Teaching Advancement, assist in the assessment of teaching when required and function as advocates for excellence in teaching within and without the University. President’s Teaching Award winners are determined by a process of nomination and selection by a committee chaired by the Vice-President and Provost.

Prof. Dunne, who received his PhD from UofT, has taught Marketing at the Rotman School since 1998. He is the co-director (with Professor Uli Menzefricke) of the Rotman Teaching Effectiveness Centre, which provides ongoing support for faculty and teaching assistants in improving their skills. “I am deeply honoured by this award and am grateful for the unwavering support given to teaching at the Rotman School. I feel privileged to have taught so many bright students. To be given an award for doing what I love is truly inspiring.”

— KAREN CHRISTENSEN
Lower Trade Barriers Improve Productivity Says New Study

A recent study on Canada’s Free Trade experience suggests that eliminating more trade barriers inside and outside Canada could lead to big leaps in Canadian productivity, which in turn would allow Canada to better fund its social programs.

The study by Economics researchers Daniel Trefler and Alla Lileeva found that Canadian companies with low productivity levels before the Canada-U.S. Free Trade Agreement (FTA) made significant productivity gains once the FTA came into effect in 1989. The gains were made because the elimination of trade barriers created the right conditions for these companies to make major investments in productivity, such as becoming more innovative with products and investing in manufacturing technology. Low productivity companies that began to export after FTA adopted new technology at more than two times the rate of their non-exporting counterparts.

The study “tells us that inter-provincial trade barriers should be eliminated as much as possible at home to make the Canadian market as accessible as it can be,” says Prof. Trefler, who holds the J. Douglas and Ruth Grant Canada Research Chair in Competitiveness and Prosperity at the Rotman School. “Policy-makers should also look at eliminating technical trade barriers that still exist between Canada and the U.S,” he says.

Rising productivity leads to increased economic prosperity and thus higher tax revenues that are available to deal with the major problems confronting society, such as how to pay for the increased demands of an aging population on Canada’s health care system.

“Canada has a 20 percent productivity gap vis-à-vis the U.S,” said Prof. Trefler. “If we could put the gap back to where it was in 1980, we would generate $68 billion more in tax revenue. Think of what that would mean.”

The complete study is available at: www.rotman.utoronto.ca/pdf/Trefler1.pdf – BY MOIRA MACDONALD

GS’s Weinstein on Unregistered Securities Markets

The recent growth of the 144A Equity Market points to a heated demand among U.S. investors for privately-placed securities, and a desire among issuers to raise capital quickly. Making the most of this trend, last May Goldman Sachs introduced its own system to allow hedge funds and other institutional investors to invest and trade in private companies.

On November 8, Gregg Weinstein, head of the firm’s markets desk and co-head of its convertible and derivatives desk, visited the Rotman School to discuss Goldman’s newest trading platform in a presentation sponsored by the Rotman School’s Capital Markets Institute, entitled “The Rise of Unregistered Securities Markets in the U.S.: Will Canada Follow?”

The new system, GS TrUE – short for Goldman Sachs Tradable Unregistered Equity – is open only to qualified institutional investors with investable assets of more than $100 million. “This is for bigger institutions that are making long-term investment decisions,” explained Weinstein.

The success of the GS TrUE’s first offering – the $880 million sale of a 15 per cent stake in Oaktree Capital Management LLC, an alternative-investment manager – may have encouraged Goldman’s competitors to participate in the market for privately-placed securities. A few days after Weinstein’s presentation, a group of leading securities firms including Goldman Sachs, Credit Suisse, Deutsche Bank, JPMorgan, Lehman Brothers, Merrill Lynch, Morgan Stanley, and UBS – announced their intention to form The PORTAL Alliance, an industry-standard facility designed to serve the market for 144A equity securities.

Following his presentation, Weinstein was joined on stage by Bob Bertram, executive VP of investments at Ontario Teachers’ Pension Plan, and Doug Steiner, chairman and CEO of Perimeter Financial Corp. and member of the Rotman Dean’s Advisory Board, to discuss whether the taste for unregistered securities was shared by Canadian investors. While there so far exists no market for privately-placed securities in Canada, there are similar products on offer that are not subject to the same regulation as the public market, said Steiner. As a potential investor in unregistered securities, he would have concerns about transparency. “The information flow is at the discretion of the people managing the market, and the issuers,” he states. “How do you give people transparent markets when the intermediaries don’t want transparency?”

Bertram shared Steiner’s misgivings about disclosure, pointing out that there was “potential for malfeasance” with such complicated equities. He preferred to take a ‘wait-and-see’ attitude toward the developing market space, yet would not be adverse to seeing his pension plan invest in unregistered securities in the future. “Teachers is a fairly large user of private equity markets, and I’m a great believer in using markets wherever possible,” says Bertram. – BY STEPHEN WATT
What kind of new thinking and creative measures are going to help us avoid a climate change crisis?

We have many of the tools and technologies that we need to address climate change. What we do not know, and what is critical to know, is this: what is the price of a ton of carbon? Finding the answer to this question is the best outcome you can hope for from a greenhouse gas market approach. Once you’ve determined the price of carbon, you need to apply additional policies and measures to avert climate change. Time is running out. If you believe what the scientists are telling us, we’re working on a tight schedule. We’re going to need additional funding and policies that will encourage the development of new technologies, from the research and development to the deployment stage, before the damage becomes irreparable.

What has been your biggest accomplishment so far in your career?

I take great pride in having been given the opportunity to work on the climate change file. The satisfaction comes from working on a challenge of such profound historical significance. Additionally, the people who work with me on this issue happen to be an enormously interesting and diverse collection of individuals, and I learn from them daily.

What has been your greatest challenge?

The greatest challenge has been to integrate a very diverse array of approaches to climate change being developed around the world, and to try to understand them, and bring them together in a coherent way. There’s a great deal of competitiveness between the various approaches, and the discord can occasionally be challenging and even discouraging. Sometimes the different initiatives even look contradictory, whereas in reality they shouldn’t be.

What’s the biggest personal or professional risk you’ve taken?

My decision to start the International Emissions Tradition Association seven years ago was, in retrospect, an enormous risk. If you recall at that time, that was the era in which the only well-known piece of environmental legislation was the Kyoto Protocol – there was no Marrakesh Accord on climate change; there was no emission trading system in Europe; there was no Clean Development Mechanism [which allows industrialized countries to invest in projects that reduce emissions in developing countries] – there was nothing. Taking a leap of faith and attempting to establish this association – which now plays a very critical role as the voice of business in the global debate on climate change – was a significant risk, more so than I appreciated at the time.

What is your fondest memory of your Rotman MBA experience?

I had some very interesting professors at Rotman, whom I remember fondly. I completed my MBA on a part-time basis, so my memories are of being at class in the evenings, studying alongside a crowd of accomplished professionals. I remember showing up at class at the end of a work day, feeling tired and lethargic, and then finding myself rejuvenated by the rigour of my studies, and by professors who challenged us to really strive for our academic achievements. If you wanted to achieve something great, you had to work hard for it.

Who do you consider to be a great thinker, and why?

I’ve had the good fortune of working with a number of really strong thinkers. One of these was Maurice Strong, the former chairman and CEO of Ontario Hydro. I worked at Ontario Hydro for 17 years and with Maurice for three or four years. While he’s had his share of successes and challenges in the course of his career, he’s certainly brought new thinking to many of the issues facing the world today, both during his tenure at Ontario Hydro – where I knew him – and later with the World Bank and the United Nations.

What do you do for fun?

As you asked me this question, my whole staff – who are here with me on a visit to Washington DC – looked at me and wondered, “How is this guy going to answer?” But yes, despite what they might think, I do have fun occasionally. Besides doing what most people do to enjoy themselves, such as watching sports, the thing that I most enjoy is deep-sea diving. I try to go diving when I can, and where I can, in places such as Italy, France, Brazil, Mozambique and Indonesia, to name a few. Diving attracts me in particular because telephones don’t work under the ocean! At least, they haven’t invented an underwater cell phone yet, so it’s quiet down there, and very peaceful.
John Campbell (MBA ’87)

In spite of his responsibility for the success of projects worth an estimated $17 billion, 60 staff members and involvement with a 12-member Board of Directors, John Campbell still thinks he has the best job in Canada.

Interview by Karen Hegmann

As president and CEO of Waterfront Toronto, could you describe the range and scope of your responsibilities?

I provide direction for the corporation in implementing government policy. Our goal is the revitalization of Toronto's waterfront, so it's really about how we operationalize and take this objective and move it forward. Revitalization is about crafting a new kind of city that is focused on public policy; it's about stopping urban sprawl and promoting transit and sustainability.

Our role is to promote the projects and activities that drive revitalization with the Board's help, and then secure funding from the government to help implement them. I head up the team that does that. We've got some great attributes in Toronto, and we want to make sure the quality of place and life are enhanced so we can be a global leader.

The Corporation was formally established by three levels of government in 2001 as the Toronto Waterfront Revitalization Corporation (TWRC). The name was later changed to Waterfront Toronto. What was behind this decision?

We wanted to make sure that the brand focused on the projects and issues happening on the waterfront, as opposed to those of the corporation. We were reluctant to give it the word ‘revitalization’ because that's the key differentiator between our model and others around the world: if you look at other models, they focus more on promoting real estate, but our model is more about public policy, trends, affordable housing, public transit and sustainability. It also involves real estate, but it's about doing it in a way that drives the right kind of city.

It's not about us, it's about what's happening out there and creating a new vision for the waterfront. It's a big picture issue, so we wanted to make it more inclusive.

A key component of Waterfront Toronto’s mission involves redefining how the city, province and country are perceived by the world. Please discuss this.

What we're doing is making sure that Toronto is world class and leading the way in a lot of areas, such as sustainability. My role is to drive that as a core value of our corporation. We’re also focused on design excellence as another core attribute, so we've brought in some of the world's best landscape architects and designers. Our design-review panel ensures that what we build involves excellent design, and we've had two very large international design competitions, so we've really got the world focused on what we're doing.

I really don't think there's a better job in Canada. We're building a new face for Toronto and are sending a signal to the world that we have it right, not only from a societal point of view, but from a quality of place and life aspect that 'this is the kind of community that attracts the best and brightest people.’

We're trying to create the kind of community that people really want to live in. One of the challenges is to figure out how to keep the public supporting us. We have two big precincts underway. Each is the size of Canary Wharf in England and Battery Park City in New York, and each is a $2.5 billion project. We have to show the public right away that we're out there doing things. We have high aspirations. It's more than just about fixing the sewers and roads, we're building a city for the future. We're trying to raise the bar and reach for the stars.

Your role demands an ability to see and think about the ‘big picture’. How do you approach short-term goals while still being able to follow a long term vision?

I think our long-term goals are out there and that's really clear, but you can't adjust your sails at once. You have to get out there and kind of tack a bit to keep course. I think to a large degree the short-term goals are designed in a way that leads us towards a long-term objective. I wouldn't say it's linear, but all the short term goals are steps towards achieving the long-term vision, so there's no incongruity. It's all part of the big package.

In the private sector the goals are high and steep but it's a straight line, whereas in the public sector, it's much more difficult: it's like playing 3D chess, because you've got so many issues to deal with.

On the issue of sustainability, you say you want it to “define us and to be the key measure against which we are judged.” To date, what has proven to be your biggest challenge on this front?

A big part of the issue is that we're not an island, we're part of a network of services. Whenever we do something that's
sustainable, we have to plug it into the rest of the system. So it becomes an issue of how to get everyone else to join in and look at things a little bit differently. Whenever you're in a leadership position and you're trying to do that, you're going against the grain of the established protocols. It makes it challenging at times, because people are comfortable with the tried and proven.

**What's the best part of your job?**
It's on those days when we move things closer and see milestones being met. This past June, for instance, we launched construction on the revitalization of the West Don Lands, which will transform an under-used industrial area into a vibrant new sustainable community for Torontonians. Once you see actual construction going on, it’s very exciting. The job can be quite frustrating in the sense that there are so many stakeholders involved. Our partners include three levels of government and a Board, so it’s not easy to get stuff done. When you see something being built, it gives you a real sense of pride.

**What is the most important lesson you learned from the MBA (EMBA 3) program?**
I think it was the broadening of horizons. I came in as a civil engineer, so the process was absolutely enlightening. My peers had such a variety of experiences and the professors were excellent. It was the opening of the doors to the other sides – to things like Finance and Accounting; it was quite an eye opener.

**What do you do to relax?**
I like to travel. I just got back from a motorcycle trip around Arizona and New Mexico on a Harley. We were down with 50 people and toured Arizona and New Mexico – 3,500 km in 10 days.

**What do you consider to be your greatest accomplishment?**
Taking on a job like this gives one the chance to contribute to the province and the city. There is a chance to leave a legacy, and people here are very inspired by that. It’s very different than adding shareholder value; it’s about what you leave behind – what you are building for your grandchildren. That’s what gets us really excited here.

For the latest on Waterfront Toronto’s activities, visit www.waterfront-toronto.ca
Colleen Albiston (MBA ’95)
President, ZSA Recruitment
Lives in: Toronto
Works in: Toronto, Calgary, Vancouver and Montreal

BEST THING ABOUT MY JOB: Solving problems, business development and mentoring stars-in-the-making.
MY BIGGEST CHALLENGE: Managing the diverse demands of businesses that are at different stages in their lifecycle. ZSA's legal businesses is a mature market leader; ZSA-X, our financial services group, is a fast-growing start up. The talent management, branding and marketing issues are very different, yet equally important.
PROUDEST MOMENT: Watching either of my two sons’ achievements.
THE WORD THAT BEST DESCRIBES ME: Positive.
THE MOST INNOVATIVE THING I’VE EVER DONE IS: To bring more structure to an entrepreneurial organization, allowing it to grow without damaging its unique and strong culture.
HOW I RELAX: Running.
MOST IMPORTANT SKILL(S) FOR MY JOB: You can learn as much from team mates and their ideas as you can learn from a text book or a professor.

WORDS OF WISDOM: You can have it all, you just can't have it all at the same time. Also, learn to let go: every battle isn't worth fighting and everything isn't a battle.
WHO I CONSIDER TO BE A GREAT THINKER: My late grandmother – and Malcolm Gladwell.

Neeraj Ghai (MBA ’04)
Manager of Accounting and Financial Reporting, Citigroup
Lives and Works in: Toronto and Montreal

BEST THING ABOUT MY JOB: The people I work with and the challenges I face daily. I feel like I’m continuously learning and leveraging the lessons of the past.
MY BIGGEST CHALLENGE: Staying on pace with all of the reporting deliverables. I took on the reporting function in January, 2007, and since then I have been racing to learn and deliver against the timelines set by our corporate reporting unit in NYC.
PROUDEST MOMENT: Contributing to two chapters of Engineers Becoming Managers, From The Classroom to the Boardroom (Xlibris, 2006), authored by Peter C. Hughes – an important read for any engineer.
THE WORD THAT BEST DESCRIBES ME: Ambitious.
HOW I RELAX: Walking the cobblestone roads of Old Montreal, or sitting back and lounging at a terrace restaurant on Crescent Street. When in Toronto, I enjoy the summer festivals, biking and my balcony.
MOST IMPORTANT SKILL(S) FOR MY JOB: In order to be successful in financial reporting, one has to be timeline driven. Planning and organization are key, as are strong analytics and a self-taught learning style.
PROUDEST MOMENT: Contributing to two chapters of Engineers Becoming Managers, From The Classroom to the Boardroom (Xlibris, 2006), authored by Peter C. Hughes – an important read for any engineer.
THE WORD THAT BEST DESCRIBES ME: Ambitious.
HOW I RELAX: Walking the cobblestone roads of Old Montreal, or sitting back and lounging at a terrace restaurant on Crescent Street. When in Toronto, I enjoy the summer festivals, biking and my balcony.
MOST IMPORTANT SKILL(S) FOR MY JOB: Teamwork, and how to effectively guide a team from various backgrounds and different skill sets towards a common goal.
WORDS OF WISDOM: What’s important to each of us is different. What’s common to all of us is the need to focus on what’s important.
WHO I CONSIDER TO BE A GREAT THINKER: Mahatma Gandhi.
On October 18, 2007, Rotman celebrated the launch of its newly upgraded alumni programs with a party and a series of announcements. More than 200 alumni and 100 current Rotman students joined together to raise a toast to the program’s “Next Big Step.”

The newly-minted Rotman Alumni Network, a name that encompasses all of the activities for Rotman alumni, officially launched. The Network was created to help alumni “Learn. Connect. Succeed.”

Among those present for the celebration were key volunteers like outgoing Alumni Board Chair James Coutts (EMBA ’99) and incoming Chair Jay Nicholson (PT’02). Associate Dean Rick Powers led off by welcoming current and future alumni. “Great business schools not only provide a great education – they help great alumni keep connected to one another and their schools. Today Rotman is proud to help you do just that.”

Rod Lohin, executive director of the Rotman Alumni Network, spoke about how “many people came to Rotman to take their next big step in their careers and lives. Rotman itself is taking another big step forward with its innovative curriculum and with a new building due in 2011. It was time for the alumni programs to take another step forward.” Lohin described the growth of the program – from the intrepid work of a few volunteers running a few events to a range of dozens of alumni events and programs at home and around the world.

There are plenty of new initiatives for the new Rotman Alumni Network; a series of communications will follow over the next year. Coming soon: a new Alumni Portal with access to more tools, more content and more alumni than ever before. As well, more career services and a range of alumni networking events. There’s even more being done abroad, particularly in key markets like New York and London.

To find out more about the launch of the Rotman Alumni Network and what it offers you, visit www.rotman.utoronto.ca/alumni where you’ll find a video of the announcements, the presentations, details about our new and upgraded programs, and lots of ways to stay connected.
Reunion Roundup


Thank you to the following Reunion Volunteers who worked tirelessly to get the word out and helped maximize attendance:

**Class of 1967 (Full-time):** Len Brooks, William Hewitt, Howard Hunter, **Class of 1982 (Full-time):** Dave Coderre, Thomas McAllister, **Class of 1987 (EMBA):** Vitor Fonseca

**Class of 1992 (Full-time):** Blair Kingsland, **Class of 1992 (Part-time):** Mary Ashbourne, Eileen McKee, Kevin Pinto

**Class of 1997 (EMBA):** Jennifer Hill, Paul Millett

**Class of 2002 (Full-time):** Juliana Kwong, Sean Martin, Rizwan Suleiman, Joe Tassone, **Class of 2002 (Part-time):** David Cheung, Jay Nicholson, **Class of 2002 (EMBA):** Cheryl Paradowski, **Class of 2002 (GEMBA):** Manfred Koo

For more pictures from Reunion 2007, visit [www.rotman.utoronto.ca/alumni/reunion.htm](http://www.rotman.utoronto.ca/alumni/reunion.htm)

For those interested in volunteering for Reunion 2008, please contact Michelle Perrotta, manager volunteers and reunion coordinator, at 416-946-3665 or at [michelle.perrotta@rotman.utoronto.ca](mailto:michelle.perrotta@rotman.utoronto.ca)

2007 Reunion Fundraising Challenge

This year the 2007 Reunion Fundraising Challenge raised over $51,000 of support for the Rotman Vision Fund! This commitment from all of the Reunion 2007 classes, together with extraordinary class spirit, exemplifies the power of alumni giving. In the end, it is what will allow future generations of Rotman students to have the quality education and lifelong friendships that reunion-year classmates experienced. Thank you to everyone who made a donation towards the Rotman Vision Fund under this Challenge – your generosity will make a tremendous impact!
A new year, a new alumni web portal, a new golf event, a new alumni logo – and lots of alumni news in the following pages. But we still haven’t heard from all of you – so now’s the time to start writing YOUR Class Note for the next issue. That edition, titled “The all-consuming issue,” will hit your mailbox in May. Your all-consuming deadline for new submissions will hit in early February. Don’t be left out! Keep them coming! – Jack

**MBA / MCOM / DBA Full & Part-Time**

**1966**
MBA Class Champion: Gary Halpenny
Gary.Halpenny66@rotman.utoronto.ca

**1967**
MBA Class Champion: Len Brooks
Len.Brooks@rotman.utoronto.ca

**1968**
MBA Class Champion: George Hayhurst
George.Hayhurst68@rotman.utoronto.ca

**1969**
Bob Beattie writes, “I got my BSc in Civil Engineering 5T2, and 16 years later returned to complete an MBA 6T9. The Engineering degree enabled me to get work I enjoyed, and the MBA broadened my thinking into organizations, human relations and being open to more possibilities. My first layoff was a shock, but led quickly to a new job focusing on scheduling construction, then on construction as a field engineer, then superintendent. My second layoff, after 13 years with an engineer-contractor was a real crisis, which I shared with my family that evening. I was 48, with 4 children 10 to 17 years old. Six months later I was able to say it was the best thing that ever happened to me: I discovered how to get another job (read What Color is your Parachute? by Richard Bolles); significantly deepened my relationship with my wife and children; and got a better job: manager of a project services department with Alcan. This turned out to be my most challenging and exciting work. Within two years of joining Alcan and moving from Toronto to Montreal, my wife contracted early onset Alzheimer’s disease, and despite the hardship, I experienced a spiritual rebirth. As a result, I was able to view my 3rd layoff as an opportunity to become a consultant in the project services I had learned. This was the most productive (measured in income) part of my life. All this to say, experience more than education prepares one for life. I have learned more through the crises than the good times.”

**1970**
MBA Class Champion: Charles Johnston
Charles.Johnston70@rotman.utoronto.ca

**1971**
MBA Class Champion: Chris Ward
Chris.Ward71@rotman.utoronto.ca

**1972**
MBA Class Champion: Jake McArthur
Jake.McArthur72@rotman.utoronto.ca

**1973**
MBA Class Champion: George Parker
George.Parker73@rotman.utoronto.ca

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Gary Halpenny, has had a very active career as chairman, president, CEO and director of significant companies in a number of countries. Following his retirement as a vice president of Westinghouse and CEO of Transelectrix Technology Inc., he continued his business interests and became chairman and president of Brink’s Canada, and following retirement became a consultant to the worldwide Brink’s International organization with both operating and financial responsibilities at the management and Board level in many countries. He has just received a four-year appointment to the Audit Committee of the City of Burlington and a three-year appointment as a member of the Ministry of Transportation Advisory Board [CAG] on the first phase of planning the Niagara-GTA Transportation Corridor. He continues to work with the Rotman School in the Integrative Thinking Practicum and the Integrative Management Program for MBA and Commerce students. He has found that his Engineering degree – where he learned that one and one is always equal to two – and his MBA degree, where one learns that you will never in the business world see one and one together again because something always changes, has been a solid foundation for a satisfying and rewarding career.

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Bowes Dempsey sent along the picture (left), featuring Bowes and Doug King (also ’69) attending the wedding of Doug’s son Andrew in Noosa, Australia. Also in the picture are Doug’s wife Pat and Bowes’ wife Yanne.

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Bob Beattie writes, “I got my BSc in Civil Engineering 5T2, and 16 years later returned to complete an MBA 6T9. The Engineering degree enabled me to get work I enjoyed, and the MBA broadened my thinking into organizations, human relations and being open to more possibilities. My first layoff was a shock, but led quickly to a new job focusing on scheduling construction, then on construction as a field engineer, then superintendent. My second layoff, after 13 years with an engineer-contractor was a real crisis, which I shared with my family that evening. I was 48, with 4 children 10 to 17 years old. Six months later I was able to say it was the best thing that ever happened to me: I discovered how to get another job (read What Color is your Parachute? by Richard Bolles); significantly deepened my relationship with my wife and children; and got a better job: manager of a project services department with Alcan. This turned out to be my most challenging and exciting work. Within two years of joining Alcan and moving from Toronto to Montreal, my wife contracted early onset Alzheimer’s disease, and despite the hardship, I experienced a spiritual rebirth. As a result, I was able to view my 3rd layoff as an opportunity to become a consultant in the project services I had learned. This was the most productive (measured in income) part of my life. All this to say, experience more than education prepares one for life. I encourage young people to take a year or more off after a first degree or perhaps after high school. After my wife died, and at age 62, I was led to stop money-earning work, sell my house in Montreal, move into a house in Guelpsh with a daughter and her husband at their invitation, and shortly thereafter to begin spending 6 to 9 months per year in a mountain village in Guatemala. I went as a volunteer, originally with a Christian development agency to help bring water to a few mountain villages, then to move to one of them, and learn Mam, one of some 23 Mayan languages. After gravity-fed water systems, projects included stoves, and pilas (small concrete water storage tanks). In March of ’99 I had a dream and saw very clearly two words: Grace and marriage. To shorten a long and fascinating story, I married Grace in Sept’99 and since then we have been spending the 6–9 months a year living in the Guatemalan mountain village at 9000 foot elevation. Learning is a lifelong process, and I have learned more through the crises than the good times.”

John Iverson is a vice president of Burger, Carroll & associates, Inc., a boutique management and information technology consulting firm with a public sector domain focus on health and human services. Previously he spent 25 years in the contemporary arts & crafts industry, first as founding president of Santa Fe Stoneworks, one of the largest production craft studios in North America, and later as founding executive director of the Arts Business Institute, an educational non-profit organization tasked with helping artists and craftspeople master the business of art. John has spent the last half of his life in Santa Fe, New Mexico. When not at the daily grind, he is fly-fishing the rivers and streams of the American West.
1974
MBA Class Champion:
Hank Bulmash
Hank.Bulmash74@rotman.utoronto.ca

1975
MBA Co-Class Champion:
Susan Frank
Susan.Frank75@rotman.utoronto.ca
Robert Johnston
Robert.Johnston75@rotman.utoronto.ca

1976
MBA Class Champion:
Jane Gertner
Jane.Gertner76@rotman.utoronto.ca

1977
MBA Class Champion:
Judy McCreery
Judy.McCreery77@rotman.utoronto.ca

1978
Jacquie Houston works at Baird MacGregor Insurance Brokers LP in Toronto handling payroll, benefits, and accounting administration. Her daughter, Erica, just turned 21. Jacquie lives in Toronto and would love to hear from her classmates. Please get in touch at jacquie.houston@3web.com.

In the recent article “A Century at Convocation Hall”, The University of Toronto Magazine’s Fall 2007 issue profiled some of the experiences of Hugh Larratt-Smith at the school in 1976. Hugh’s family is one of the oldest continuous legacy families at U of T, dating back to 1840.

1979
MBA Class Champion:
Lorn Kutner
Lorn.Kutner79@rotman.utoronto.ca

1980
MBA Full-Time Class Champion:
Frank Hall
Frank.Hall80@rotman.utoronto.ca

1981
MBA Full-Time Class Champion:
William Molson
William.Molson81@rotman.utoronto.ca

1982
MBA Full-Time Class Champion:
Danny Chau
Danny.Chau82@rotman.utoronto.ca
MBA Part-Time Class Champion:
Daniel Eng
Daniel.Eng82@rotman.utoronto.ca
Michael Hale
Michael.Hale82@rotman.utoronto.ca

1983
Eli Javier is director, information technology at DBC in Toronto.

1985
MBA Full-Time Class Champion:
Gerald Legrove
Gerald.Legrove85@rotman.utoronto.ca

1986
MBA Class Champion:
Roy Turunen
Roy.Turunen86@rotman.utoronto.ca
Susan Bartholomew is an associate professor at Queen’s School of Business.

1987
Nancy Ku was recently named president and CEO of GE Commercial Finance China, marking the launch of a new integrated approach to the market for the firm. Nancy assumes this new position while maintaining her current responsibilities as president and CEO, GE Corporate Financial Services Asia. She joined GE in 1998 and has served in a variety of leadership roles including managing director, GE Commercial Finance Equity Asia. She has also held several key positions with HSBC, CIBC, and Citibank. In addition to her Rotman MBA, Nancy holds a BA from the University of Waterloo.

1988
MBA Class Champion:
Grace Cheung
Grace.Cheung88@rotman.utoronto.ca
Maureen McAleese is the administrative officer for Vancouver Radiology Inc. She joined Northern Telecom in marketing in 1988, and moved to BCTel, later Telus, in 1990, where she stayed until 2005, working in a variety of marketing functions, the most recent being project management in new service development. Maureen resides in Vancouver, is married, and has two boys, born in 1999 and 2003.

Paul Van Damme has been appointed CFO of Bradmer Pharmaceuticals. Previously he held the senior finance position on the management team of three publicly traded life science companies, Vasogen Inc., Lorus Therapeutics Inc. and
NPS Pharmaceuticals, Inc. (formerly Allelix Biopharmaceuticals Inc.). He serves on the board of directors and the audit committee of the Ontario Genomics Institute and earlier in his career, was an Audit Manager for PricewaterhouseCoopers.

1989

**MBA Full-Time Co-Class Champions:**

David Pyper  
David.Pyper89@rotman.utoronto.ca  
Maria Milanetti  
Maria.Milanetti89@rotman.utoronto.ca  
**MBA Part-Time Class Champion:**  
John Harris  
John.Harris89@rotman.utoronto.ca

**Reunion Alert!**

The Class of ’89 will be having a Thirsty Thursday 20th Reunion to mark our 1989 Frosh Week (a little late) on Thursday, February 21, 2008. It will be at our old hang out – the second floor of The Duke of York, 39 Prince Arthur Ave. at 7:00 p.m. Please RSVP to classmates Maria Milanetti mmilanetti@sympatico.ca or David Pyper dpyper@blairfranklin.com if you get a chance.

Bringing over 12 years experience in the investment banking industry, Blair Abernethy recently joined Westwind Partners Toronto office in the role of senior technology analyst. For the past eight years, he has held several senior analyst positions including vice president and senior technology analyst and head of research and partner, where he managed a research department covering six core sectors. In addition to his Rotman MBA, he holds a B.Sc. Electrical Engineering from the University of Michigan-Dearborn and a CFA designation.

**Vivek Raju** is head of marketing for Parikrama Humanity Foundation on Bangalore, India.

1990

**MBA Part-Time Class Champion:**  
Steve Rosen  
Steve.Rosen90@rotman.utoronto.ca  
Debbie Cass is a marketing manager for IBM Canada in Markham.

**Dave Hyndman** is director of tourism solutions for T4G Limited in Charlottetown, PEI.

1991

**MBA Full-Time Class Champion:**  
David Littlejohn  
David.Littlejohn91@rotman.utoronto.ca  
**MBA Part-Time Class Champion:**  
Pamela Kanter  
Pamela.Kanter91@rotman.utoronto.ca  
**Jacqueline Baptist** is director of corporate marketing at NAVREQ Corporation in Chicago.

**Jenny Ho** is a customer development specialist with Suncorp Metway in Brisbane, Australia.

1992

**MBA Class Champion:**  
Blair Kingsland  
Blair.Kingsland92@rotman.utoronto.ca  
**Steve Reesor** retired after completing 30 years of service with the Toronto Police where he rose to the rank of Deputy Chief. He did a two year stint at Magna International as vice president of special projects and is now president of his own security company, Harbour Group Security & Investigations Inc. His company provides protective and investigative services primarily catering to corporate, commercial and industrial clients.

**Lyne Siemens** is teaching at the University of Victoria in Business and Public Administration. A recent highlight was the successful defense of her PhD thesis on ‘small business in rural and remote Vancouver Island.’

1993

**MBA Full-Time Class Champion:**  
Daniel Lin  
Daniel.Lin93@rotman.utoronto.ca  
Jancie Ellerby is the general manager of operations with Raffles Campus / ER International School in Singapore. She joined Raffles after four years in Abu Dhabi, UAE at an exclusive private girls’ school in academics and administration. Janice and her husband Richard Singer have been exploring the Middle and Far East during their time overseas and look forward to more adventures during their time in Singapore.

**Yoshiko Kabayashi** is chief, office of international intelligence and operations of the National Police Agency of Japan, in Tokyo.

**Rowena Wong** has moved back to her hometown of Vancouver since graduation in 1993. “In November 2007, I travelled in South America for a month. My family and friends often tease me about opening a travel agency because I am such a travel enthusiast. Maybe I will after this trip because I will then be able to tell my customers that I have travelled to every continent on the planet!”

1994

**MBA Full-Time Class Champion:**  
Glenn Asano  
Glenn.Asano94@rotman.utoronto.ca  
**Daniel Ah Chong** is running two logistics companies in Mauritius, a 3PL, 15,000 m2 warehouse and distribution centre and a freight-forwarding company. He manages some 350 employees and travels regularly to Europe and Asia, but unfortunately not often to North America. “Anyone on holidays in Mauritius, also known as Paradise Island, should give me a call.”

**Alice Thomas** recently joined Sun Life Financial in Toronto as vice president, e-business and call centre solutions. She is responsible for providing thought leadership and innovation in the development and support of all client-centric applications for the web and call center. Alice sends her regards to all her fellow classmates and looks forward to hearing from them!

1995

**MBA Full-Time Class Champion:**  
Nick Strube  
Nick.Strube95@rotman.utoronto.ca  
**Jill Burgin** is currently living and working in London, England along with her husband, Mike Flood and two daughters, Samantha (age 4) and Sarah (age 2 1/2). They are expecting their third child in mid-February. The family moved to England in September 2006 when Mike was transferred by TD Capital to head up their London office. Jill is working part-time for Diageo Inc. in their global office, helping to bring a global marketing communications tool to the firm’s in-market companies around the world.

1996

**MBA Full-Time Co-Class Champions:**  
Christina Wong  
Christine.Wong96@rotman.utoronto.ca  
Suzanne Wilcox  
Suzanne.Wilcox96@rotman.utoronto.ca  
**MBA Part-Time Class Champion:**  
Daisy Azer  
Daisy.Azer96@rotman.utoronto.ca  
**Khozema Alyamani** is managing director of Al Arwa Trading Ent., in Dubai.

**Sheila Boyce** and her husband Tom are still living in Miami, FL. They have started a new business, DeepStream Designs, to develop and sell Tom’s creative ideas. Their first major product line comprises high-design architectural planters made of exotic hardwoods and proprietary aluminum legs, which are geared towards high-rise balconies, rooftop terraces, and public spaces. They will be adding high-end recycling and waste receptacles aimed at the hospitality market in 2008. Check out their website: www.deepstreamdesigns.com.

**Jodie Parmar** is director of business and strategic innovation with the City of Toronto, where he oversees energy, real estate development, and strategic projects. He led the critically-acclaimed, international design competition for the $40 million revitalization of Nathan Phillips Square. In September 2007, the project received two, independently-juried awards: an Award of Excellence from the Canada-Ontario Public Service Quality Fair and an Urban Design Award of Excellence for Visions and Master Plans. Jodie has also assumed leadership for the revitalization of Union Station, Canada’s busiest transportation hub. He is leading the City’s renewed efforts, in collaboration with the federal and provincial governments, to restore the grandeur of this national historic site as a public space and strengthen its ability to meet growing public transit demands in an era of climate change by enhancing the station’s economic sustainability.

1997

**MBA Full-Time Class Champion:**  
Burke Malin  
Burke.Malin97@rotman.utoronto.ca  
**MBA Part-Time Class Champion:**  
Nancy Crump  
Nancy.Crump97@rotman.utoronto.ca
Steve Geodeon is a professor at Ryerson University in the Ted Rogers School of Management, Entrepreneurship and Strategy. He remains heavily involved in starting up new companies and is the president/chair of CEO Fusion, chair of the National Angel Organization Education Committee, faculty advisor to Students in Free Enterprise, advisor to the Ontario Partnership for Innovation and Commercialization and chair of the Aristotle Education Foundation. He still races his 40’ sailboat at the National Yacht Club.

Fredrik Nilsson is a portfolio manager at Ontario Teachers’ Pension Plan in Toronto.

Alexander Steiner is still living in Berlin, but is traveling a lot throughout Europe pursuing new opportunities at Skandia due to a takeover by Old Mutual. He recently moved from a local role (country manager Germany), to a regional role as COO Central Europe. He is enjoying family time, but doesn’t get to see them too much. “My wife Sarah is a home room teacher for grade three at an international school; the girls are growing by the day. I’m fighting with the languages… I start a sentence in English, and finish it in German, and from time to time I throw in some Spanish.”

Eric Unrai is director of carrier services for EQO Communications in Richmond, BC.

MBA Class Champion: 1998
Mari Iromoto
Mari.Iromoto98@rotman.utoronto.ca

Lucas Chang and his wife Judy Wong (also 1998) look forward to celebrating younger daughter Leah’s first birthday in January, especially having just celebrating Keira’s third birthday in style. Outside of family, Lucas continues to enjoy his role as director of project planning and delivery at TELUS.

Andrew Doman is COO at Man Investments Canada Corp in Toronto.

Katy Kaposi is associate vice president, enterprise decision support for TD Bank Financial Group in Toronto.

Andrew (Drew) Ness is currently the supervisor of academic and student services at Fujairah Men’s College in Fujairah, UAE.

The family has enjoyed the Emirates immensely, and has travelled extensively since arriving here in 2005. They will be repatriating in March as Drew has accepted an administrative position at Queen's University in Kingston.

Mohan Srinivasan is the CFO and VP of general administration for ARA Inc. in Beltsville, Maryland.

MBA Class Champion: 1999
Lenore Macadam
Lenore.Macadam99@rotman.utoronto.ca

Aran Hamilton
Aran.Hamilton99@rotman.utoronto.ca

Tom Elliott and Jennifer Steckel Elliott (also 1999) have recently moved back to Toronto from the UK with their children Jaqueline and Turner. They are enjoying being back home with friends and family after a great adventure. Tom is VP of corporate development at Kinross Gold, and Jennifer is doing strategic consulting for a number of organizations.

Aran Hamilton is engaged. “The magic of a watching a sunset on a Nova Scotian beach, hand-holding with the most wonderful woman I’ve ever known, and a large bank of clay combined to overwhelm me. I fashioned a ring out of clay and I believe that Krista may be the first person I know with a five-carat engagement ring (ok – so it was a quartz pebble, but it’s HUGE).” Aran and Krista are based in Toronto, where Aran is the regional VP responsible for VeriSign’s business in Canada. He is proud to report that the Canadian team is on track to almost double VeriSign’s business here compared to last year. Aran and Krista are looking forward to catching up with (and meeting) many friends from Aran’s time at Rotman.

Susan and Tomi Poutanen welcomed their first child, Anna, in February and are enjoying parenthood to date. Tomi left Yahoo to start his own software venture in Toronto.

Baljit Salh is the owner of Bluedot Neighbourhood Tire Ltd., which owns and operates the Canadian Tire store in Cochrane, Ontario. He is having fun preparing to build a new store in mid 2008. “Drop on by to say hello when in the area!”

Eve Schwarz has opened her own family law practice at Bayview and Eglinton and will soon be opening up another office at Baldwin Street. Eve has enjoyed her travelling adventures, which have included a four-day hike in the Thailand hill tribes, a four-day hike along the Inca trail to Machu Picchu, a trip deep into the Amazon jungle, and a recent trip to South West Africa. “Warmest wishes to my Joint LL.B/MBA. colleagues.”

MBA Class Champion: 2000
Mitchell Radowitz
Mitchell.Radowitz2000@rotman.utoronto.ca

Ivi Ahuja is director of investment banking at Toronto Dominion Bank. She has recently had their second child. When she isn’t smiling, eating or screaming, Emily has her older child, Anna, in February and are enjoying parent- hood to date. Tomi left Yahoo to start his own software venture in Toronto.

Colin Anderson is director, Ontario regulatory affairs at Ontario Power Generation in Toronto.

Sally Dufresne is on a leave of absence from TD Securities Human Resources. She moved to Düsseldorf, Germany with her husband Steven and their two children (Ryan, 2½ – and Alex, 1) in January 2007 and is enjoying the ex-pat lifestyle, trying to enjoy traveling throughout Europe with two kids in tow! After having spent the last six years at AOL Canada (culminating in the role of CEO), Jonathan Lister has moved his family to London, where he now runs operations for AOL Europe in the UK and oversees search, products, paid services and programming. His two girls are enjoying school in London and his wife is in the midst of moving her business to the UK.

Mitchell Radowitz recently joined Romspen Investment Corporation as an investment analyst, Romspen is a non-bank mortgage lender and real estate financier.

Karen Tyler ran into Scott Vickery at the Milestones by the airport in September and started to wonder what everyone else was up to. “Seven years is a long time!” She’s a senior manager in transfer pricing at Deloitte (“with a mining and debt focus – go figure”) and “doing way too much traveling to have two little kids at home.” She loves her nanny (no laundry since last April) and living in Waterloo. The entire family travelled to Disney in October and will head to Germany in the spring. Next year she plans to report that she has won the lottery and will be buying an island. “Best wishes to everyone!”

MBA Class Champion: 2001
Daniel Zinman
Daniel.Zinman01@rotman.utoronto.ca

Lisa Sansom
Lisa.Sansom01@rotman.utoronto.ca

Walter Sophia
Walter.Sophia01@rotman.utoronto.ca

Robert Field was recently appointed divisional logistics manager for the car care products of Canadian Tire. His team is responsible for the forecasting and replenishment of oil filters, automotive chemicals, wiper blades and pressure washers. Robert and his wife Wei He (PhD 2001) recently had their second child. When she isn’t smiling, eating or screaming, Emily has her older sister under constant surveillance.

Matt Gibson and Dominique Barker (1998) welcomed their son Felix Bradley into the world in June, joining his 17-month old sister Jacqueline. In their limited spare time, Matt is in institutional sales at RBC and Dominique is a research analyst at Credit Suisse covering the alternative energy sector.

Bruce Ing recently joined the Ontario Teachers’ Pension Plan’s Infrastructure Group (“TIG”), which invests in infrastructure around the world and presently has $9 billion under management.

Manny Singh is VP sales for Trans Pacific Air in Surrey, B.C.
the wedding – including Reuben Levy (2002), who was a groomsman, Amanda Karahanas (2007), Rachael Gillespie (2007) Sean Martin (2002), and many more were invited but unable to make the trip to New York. “We’ll certainly be sure to steer our (future) children towards Rotman!” Berkeley continues to work for Citigroup in Derivatives in their Toronto office, after having spent two years in New York where he met Maxine and convinced her to move to Toronto with him. “We’re continuing to live in Toronto, as Maxine just recently started working for Bain & Company out of their Toronto office.”

Rob Lauzon is managing director with Middlefield Capital Corp. in Toronto.

Neil Lindsay is a manager in the corporate finance branch of the Ontario Financing Authority. He also tutors MBA students, Executive MBA students, and professionals in finance (www.financetutor.net.) On New Year’s Day 2007, the Lindseys welcomed their son, Cameron, into the world.

Randal Slavens is senior manager of margin management, portfolio analytics and real estate secured lending at TD Canada Trust. Caroline Sohn is an investment manager, equity, at Export Development Canada in Ottawa.

Sally Whitehead has left her cross-border securities law practice at Skadden, Arps. After nine years in Toronto, she is returning home to Vancouver, where she plans to spend her first few months enjoying the ski season and tending to the family real estate business. If you happen to be in Vancouver, or need a tour guide at Whistler, drop her at line at sallydwhitehead@yahoo.ca.

2003 MBA Full-Time Class Champion: Pamela Beigel
Pamela.Beigel03@rotman.utoronto.ca

MBA Part-Time Co-Class Champions:
Jennifer Chan
Jennifer.Chan03@rotman.utoronto.ca

Rajesh Dixit
Rajesh.Dixit03@rotman.utoronto.ca

Ken Charnin is an equity research analyst for Acadian Securities in Halifax.

Liz Clarke says “It has been a privilege to serve Centennial College as a professor of E-Business for the past seven years. However, as they say, all good things must ... morph into something new! I am thrilled to join Trans-Lucent Markets in the role of director of business development and communications. This emerging technology company, located in Guelph, Ontario, has been a client of my consulting practice for a few years and it has been fascinating to participate in their growth and development as an arm’s-length consultant. To accept this challenging position, I am taking a leave of absence from Centennial.”

Trans-Lucent is a leading provider of web-based business intelligence tools. TLM currently focuses on providing flexible reporting, analysis and insight into the financial impact of freight expenditures for manufacturers, distributors, and third party logistics (3PLs) companies.

Oliver Zhenhong Guan is a project manager for Loblaws, in Brampton.

Amir Mujumdar is an associate with Lazard Freres & Co. LLC in San Francisco.

Sherry Pedersen-Ajmani is director of HR and leadership development at Maple Leaf Foods in Toronto.

Ashoor Rahim is senior consultant, performance and contract management for the Toronto Central Local Health Integration Network.

Mike Rose is currently on leave from TD Bank and is considering his next career move. After working for three years on China and India research with a Canadian bank, Eric Yan recently moved to Toronto-based Movix Fund Management as a portfolio manager, where he will manage an Asia-Pacific fund. The Yan family was glad to welcome the fourth member, Flora, into the world in May. The family is planning a trip next year to see the Beijing Olympics. Eric sends best wishes to the Class of ’07.

Jack Yang is vice president of credit structuring at Deutsche Bank in Singapore.

Pengjun Zhang and his family moved to Shanghai late last summer, where he is director of business development for Manulife-Sinochem Life Insurance.

2004 MBA Full-Time Class Champion: Adriane David
Adriane.David04@rotman.utoronto.ca

MBA Part-Time Class Champion: Steven Lane
Steven.Lane01@rotman.utoronto.ca

Janet Cheng is a senior investment manager for CIBC Trust in Toronto.

Martin Cleaver (MBA Exchange ‘04) just founded Blended Perspectives Inc. (www.blendedperspectives.com/), an ‘Enterprise 2.0’ Consultancy. “Focused on providing strategic advice and technology implementation, we use Wikis and Mashups for enabling large-scale change projects and concept mapping for knowledge articulation. I’d be very interested in hearing from anyone working in similar fields: 416-786-6752.”

Sarah D’Souza is a supply chain associate at Mars Canada, in Bolton.

Rachel Doll is on maternity leave from her role as a manager in marketing strategy with Canadian Tire Corp, to care for her daughter Sophie, who was born in April 2007. “We have been enjoying walks in High Park, travels to visit grandparents in Mexico, as well as a few other ‘mom and baby’ activities. Time sure flies while you are watching a little one grow. I look forward to catching up with classmates at Rotman events in the new year.”

Tim Ferris is the founder of Average Joe Sports Club (www.AverageJoeSports.ca), which runs recreational sports leagues for adults in Burlington and Oakville. In addition, he recently took a position working directly under the owner of a new minor professional basketball team coming to Hamilton, Ontario. The team will be playing out of Copps Coliseum starting in November of 2008. Tim is still living happily with Morgan Hill (MBA ’05) in South Etobicoke.

Christopher Gronski is working on his PhD at the Ivey School of Business. Dan Guenther is a manager with ZS Associates in Frankfurt. “The whole family is looking forward to exploring Europe and experiencing a different culture.”

Henry Jun Liu is a business manager for Procter & Gamble Canada in Toronto.

Lisa Mitmaker is a project analyst at Cancer Care Ontario in Toronto.

Marcela Oropoulous is a director with Bell Canada in Toronto.

Shane Pounder recently moved to Maple Leaf Foods as a Six Sigma Black Belt.

Shaily Sanghvi is a senior consultant with Deloitte Consulting in Philadelphia.

Brad Smith is based in Montreal. Working as a group product manager on the Garnier brand for EOreal Canada. “Montreal has been very kind to me. I’m really enjoying the city and its dynamic vibe. It was here that I met my wife, Lise Hernandez, while I was doing my internship at EOreal during the Rotman summer break. In February, Lise and I welcomed Ryan Smith-Hernandez into the family. The thrill of having a little guy at home has been nothing short of amazing. The only disadvantage of living in Montreal (aside from the numerous potholes in the roads and the high taxes that are supposed to pay for repairing them) is that it’s been difficult to keep in touch with my classmates. Fortunately, the Rotman Class Notes have kept me out of the dark. That said, I welcome the chance to meet up with fellow classmates/alums traveling through Montreal.”

Julia Stepanova is a CDO/CLO analyst for American Capital Strategies in New York.

2005 MBA Full-Time Co-Class Champions: Fiona Cunningham
Fiona.Cunningham05@rotman.utoronto.ca

Tanbir Grover
Tanbir.Grover05@rotman.utoronto.ca

MBA Part-Time Class Champion: Bob Kapur
Bob.Kapur05@rotman.utoronto.ca

David Aycan moved to San Francisco to join design firm IDEO, where he “works and plays” as a designer and project leader and is part of the business factors discipline. He also continues to design for Dull Clothes, the startup he co-founded with fellow Rotman Grads Jonathan Elias and Tom Hyde. He’s enjoying the lack of winter in CA, has taken up surfing and continues to skateboard.

Sarika Goel is a research analyst at Royal Bank of Canada (Europe) Ltd, in London.

Ramith Jose is a senior manager at CIBC World
looks forward to a few drinks with alumni in the since graduation, he is “still on the market” and Lal’s friends have gotten engaged and married after two years in the project finance practice at American Express in Markham.

American Express in Markham.

business development with SGS China in Beijing.

International Law and Practice section of the & Investment Institute, is a member of the

Member of the United Kingdom Securities Investment Institute.

Charles Li is a senior manager with Scotia Capital in Toronto.

Jade Jing Liang is senior manager, strategic business development with SGS China in Beijing.

Chetan Mehta is manager of financial reporting and procurement for Professional Engineers Ontario in Toronto.

Greg Nielsen is a senior investment associate for Ontario Teachers’ Pension Plan, in the private capital division.

Daniel Phillips is proud to announce his marriage to Dr. Winnie Wong on August 25th, 2007 at Emmanuel College on the University of Toronto campus. “It was hot, humid and one of the few days that rained all summer, but it couldn’t have been a more perfect day!”

Since September 2007, Daniel Pinheiro has been the country sales director at Coface do Brasil (www.coface.com), a world leader in trade-credit information and protection (Trade Credit Insurance) serving 85,000 clients in 93 countries. Coface has its head office in Paris, France, and is fully-owned by the bank group Natixis. In Feb, 2007, Karin and Daniel welcomed their first child, Arthur Lorenzo. Karin, Daniel, and Arthur send their best wishes to the Rotman Community.

Lal Wanniapa recently joined Bilfinger Berger BOT, a development firm in the infrastructure sector specializing in public/private partnerships. He joined Bilfinger after two years in the project finance practice at PricewaterhouseCoopers. Although many of Lal’s friends have gotten engaged and married since graduation, he is “still on the market” and looks forward to a few drinks with alumni in the Markham area.

2006

MBA Full-Time Co-Class Champions:

Bill Fox
Bill.Fox06@rotman.utoronto.ca
Paul Nagpal
Paul.Nagpalo6@rotman.utoronto.ca
Paul Ferma
Paul.Ferma06@rotman.utoronto.ca
Shruti Owerie
Shruti.Owerie06@rotman.utoronto.ca

MBA Part-Time Class Champion:

Ushnish Sengupta
U.Sengupta06@rotman.utoronto.ca

Sean Buckley is an associate with BMO Capital Markets in Toronto.

Juan Carlos Cabanillas Leon is a consultant with Deloitte in Calgary.

Rob Chang is a director of portfolio management at Middlefield Capital Corp in Toronto. He recently coached/competed at the national dragon boat championships in Calgary and won Bronze in the 500m. One of his crews has qualified to represent Canada at the 2008 World Club Crew Championships in Penang, Malaysia.

Paul De Guida is a manager at Accenture in Mississauga.

Jeronimo De Miguel is leaving investor relations and getting ready for his next move at Manulife Financial/ John Hancock. As a member of the Accelerated Career Track Program, he is considering options in product development and marketing in Asia, Canada and the U.S. He recently returned from Mendoza, Argentina – his homeland – and encourages everyone to stop by his family’s restaurant and wine business in Toronto’s Little Italy district for a taste of organic Cabernets and Malbecs from the region. For more information visit www.oliviasats3.com

Xavier Debane is a consultant with The Boston Consultant Group in Toronto. Over the past year he has focused on Financial Services and Retail industries in Canada but that is about to change: at press time, Xavier was ramping up for his impending transfer to BCG’s Mumbai office in January 2008. He is thrilled with this opportunity to explore new horizons and discover one of the fastest-growing countries in the world. His family will be along for the Indian adventure, including the new addition, Eloise, born last January. Xavier sends his best wishes to his class and other alumni. “Feel free to get in touch if you are coming through Mumbai in 2008.”

Patrick Donnelly is an equity research associate, metals and mining at Salman Partners Inc., in Toronto.

Andrei Edwards is a lawyer at Deeth Williams Wall LLP in Toronto, where he practices intellectual property and information technology law.

David Garcia is a client service support manager for TELUS in Toronto.

Sameet Kanade joined Blackmont Capital in Toronto, after 1½ years at Canaccord Adams, in the technology equity research department.

Justin Klein is brand manager for Tide Canada at Procter & Gamble. He recently got engaged to Amy Lichtman, and will be tying the knot in August of 2008.

Remit Malhotra and his wife Deepika were blessed with a baby girl “Tia” on Sep 22, 2007. The proud parents find themselves lucky for the difference Tia has made in their lives.

Rishi Marwah is continuing in his role as a management consultant with DPWN Business Consulting and has been travelling to Singapore, Indonesia, Australia, New Zealand and India on project work. He moved from the Bonn office to the Singapore office in October and looks forward to hopefully meeting a few Rotman alumni there.

Eric May recently returned to Toronto and has joined Hershey Canada as an associate brand manager.

Gary McNelly is director of strategic planning and research at Manulife Financial in Boston.

Arvind Mirtipati is an equity research associate, medical technology at RBC Capital Markets in Minneapolis.

Natacha Parekh is an associate at Goldman Sachs in London, UK. She travelled to India over the holidays this year.

Felicia Predie has joined Spin Master Ltd., in Toronto, as category advisor.

Gina Rizhanovskv is president & CEO of PCM Technologies in Concord, ON.

Anuja Sheth is an associate director at Bell Canada in Newmarket.

Elena Uhorcova is an energy trader with RBC Capital Markets in Toronto.

2007

MBA Full-Time Co-Class Champions:

Francois Cartier
Francois.Cartier07@rotman.utoronto.ca

Chokks Nataranjan
Chokks.Natarajan07@rotman.utoronto.ca

Nobu Soda
Nobu.Soda07@rotman.utoronto.ca

Patrice Bansa
Patrice.Bansa07@rotman.utoronto.ca

MBA Part-Time Co-Class Champions:

Kate Armstrong
K.Arstrong07@rotman.utoronto.ca

Zhen Xiang
Zhen.Xiang07@rotman.utoronto.ca

Ahmed Abouel-Kheir found his dream job as a financial/business analyst at FedEx Canada. His role is a mix of strategic management and financial analysis. (Those of you out there who took financial management with Asher know what he is talking about) His son, Yaseen, just entered pre-school, giving some room for his parents to breathe some fresh air :) Ahmed misses getting together with the class of 2007 in the Atrium. He wishes all the best for his classmates and looks forward to the next reunion.

Patrice Bansa is happy to announce the birth of his second daughter, Serena, last summer. The whole family is happy she is healthy and living up to her name. Patrice returned to Dhal Brothers Canada Ltd. as VP Marketing leading its strategy product.
development and marketing efforts for North American plumbing valves. 

**François Cartier** (below) is manager of mergers and acquisitions at Direct Energy in Toronto. 

**Jonathan Coyne** is the senior director of marketing at Iovate Health Sciences. “We make and market nutritional supplements and OTC drugs primarily catering to health, wellness, and fitness. I was a social rep for the class, and was also valedictorian. I’m married to a beautiful woman names Jennifer, and we have a daughter – Zahra – who is the reason I do everything I do. I hope to stay in touch with all of my classmates, and truly extract the real value of the MBA – my friends!”

**Olivia Fraser-Smith** is assistant underwriting advisor at White Mountains Reinsurance Underwriting Services Ltd in Bermuda.

**Jessica Fung** is now working at OANDA Corporation in Toronto.

**Raj Krishnan** is technical consultant for Infor Global Solutions in Toronto.

**Patrick Liang** is a project manager in the Markham office of Digital Vantage Point Inc.

**John Lin** is a performance information specialist at Sunnybrook Health Sciences Centre in Toronto.

**Shouyi Ma** joined Nortel Networks as part of the New Grad Leadership Program. Shouyi has been learning a lot in the first rotation within the Investor Relations group. He wishes all the best to the Class of ’07 and hope to keep in touch with old friends and meet more Rotmanians down the road.

**Paul Malin** recently founded Zumara, a software company based in Toronto. Zumara is working on an online music solution and is designing, building, and managing custom Facebook applications for third parties.

**Chokks Natarajan** has worked in the information technology sector, both in U.S. and India, and has extensive experience in information technology consulting, project management and offshore outsourcing. Chokks is passionate about global travel, learning about new cultures, and American football. This fall, he joined Capgemini Canada as a senior consultant, at their Toronto office.

**Manuel Perez Palacios** is an associate with Alcan Inc., in Montreal.

**Daniel Preciado** is CFO at Innovak Global in Chihuahua, Mexico.

**Subra Ramanathan** is vice president of Four-S Services in Mumbai.

**David Ricardelli** is an institutional equity associate at Merrill Lynch in Toronto.

**Daniel Tarasovsky** is senior product manager at AMD in Markham.

**Karthik Vijayapalan** was an international exchange student from the Indian School of Business. In spring 2007, he attended Rotman with the full-time MBA students on exchange. He is currently working at Yes Bank in Mumbai.

**Dennis Woo** is a corporate strategy consultant in the Toronto office of Deloitte. He and his wife Selene recently returned from their four week honeymoon in Central Europe where they visited Germany, Austria, the Czech Republic, Hungary and Croatia. Dennis sends his best wishes to the Class of ’07 and looks forward to seeing them soon.

**Yixiang (Cosmo) Zhang** is an analyst with Lusitug Research in Toronto.

### EXECUTIVE MBA

**1985**

**Class Champion:**
Bob White
Bob.White85@rotman.utoronto.ca

**1987**

**Class Champion:**
Vitor Fonseca
Vitor.Fonseca87@rotman.utoronto.ca

**Peggy Simons** retired from Petro-Canada and the University of Calgary some years ago, and has been enjoying international travel ever since. Recent highlights have been trips to Tanzania in January of 2006 to hike up Mount Kilimanjaro, and to Scotland in September of 2007 to hike the West Highland Way.

**1989**

**Co-Class Champions:**
Peter Murphy
Peter.Murphy89@rotman.utoronto.ca
Bill Brown
Bill.Brown89@rotman.utoronto.ca
Ken Cranston is senior vice president, shared services group at Scotiabank in Toronto.

**1990**

**Class Champion:**
Jeffrey.Wayne
Jeffrey.Wayne90@rotman.utoronto.ca

**1992**

**Kevin Glass** has been appointed chief financial officer of Retirement Residences REIT. Before joining Retirement REIT, he was CFO of Atlas Cold Storage Income Trust, the largest Canadian and second largest North American provider of public refrigerated warehouse services. Prior to that he was CFO at Vitran Corporation, a freight and distribution service company with operations in Canada and the U.S., and at Livingston Group, a major North American customs brokerage and third party logistics provider. Kevin, a Chartered Accountant, is a former foundation board secretary and treasurer at William Osler Health Centre.

**1993**

**Class Champion:**
Andy Hofmann
Andy.Hofmann93@rotman.utoronto.ca

**Gary Boardman** has retired from the software business and is currently attending a three-year podiatric medicine program at the Michener Institute to become a chiropodist. “My best to all EMBA’9’s.”

**Frederick Innis** is a partner at Osprey Capital Partners, an investment banking house that provides financing and merger and acquisition services to mid-market private and public companies. Osprey is based in Toronto, with offices in Winnipeg and Calgary. Frederick can be reached at innis@ospreycapital.ca

**1994**

**Class Champion:**
Andrew Stewart
Andrew.Stewart94@rotman.utoronto.ca

**1995**

**Class Champion:**
John Ramdeen
John.Ramdeen95@rotman.utoronto.ca

**1996**

**Co-Class Champions:**
Jon Waisberg
Jon.Waisberg96@rotman.utoronto.ca
Carmine Domanico
Carmine.Domanico96@rotman.utoronto.ca

**Kelly Bray** recently relocated from the east coast to the west, as COO of Bardel Entertainment in Vancouver.

**1997**

**Class Champion:**
Jennifer Hill
Jennifer.Hill97@rotman.utoronto.ca

**1998**

**Class Champion:**
Ashok Sharma
Ashok.Sharma98@rotman.utoronto.ca

**Nick Caduc** is a partner with Blackstone Partners, “a Canadian based firm of dedicated management consultants committed to making a difference in the lives of our clients and our communities.” See www.blackstonepartners.ca for more. Nick and his wife Lianne just celebrated their 15th wedding anniversary and have two wonderful (and energetic) daughters, Sydney and Alexandra. He is delighted with his decision back in early ’06 to join Blackstone so that he could focus his energies closer to home with his family and assist in building a primarily Toronto-based consulting practice.

**1999**

**Co-Class Champions:**
Steve Doede
Steve.Doede99@rotman.utoronto.ca

Desmond Preudhomme
Desmond.Preudhomme99@rotman.utoronto.ca

**Mike Stevens** is president and owner of Integrated Fulfillment Management Services Inc., a third party logistics company based in Delta, BC. For more information, see www.integratedfulfillment.com. After three provinces and 10 years at Sprint Canada, Mike and family decided to ‘hang up’ on the telecom business and return to BC.
After a brief search, the family purchased Integrated Fulfillment in April 2003 and has been fully occupied ever since. Mike, Annette and Mackenzie (now 10) live in Tsawwassen, just south of Vancouver, and are thoroughly enjoying life on the west coast. He hopes that the continued success of the business will lead to opportunities to return to the GTA and catch up with friends, “perhaps even stroll through the odd round of golf.”

2000
Co-Class Champions:
Jennifer McGill-Canu
Jennifer.McGill00@rotman.utoronto.ca
Bruce Lawson
Bruce.Lawson00@rotman.utoronto.ca
Joseph Mapa was recently elected chair of the Council of Academic Hospitals of Ontario, an advocacy collaborative for the 25 academic hospitals serving Ontarians.

2001
Co-Class Champions:
Ken Hagerman
Ken.Hagerman01@rotman.utoronto.ca
Gary Ryan
Gary.Ryan01@rotman.utoronto.ca
Beth Brook, Gerald, and big brother Kai are thrilled to welcome Torin Patrick Brook Blackstock into the family. Torin was born August 22 and is settling into his home in Port Hope.

2002
Class Champion:
Cheryl Paradowski
Cheryl.Paradowski02@rotman.utoronto.ca

2003 (EMBA 19)
Class Champion:
Jennifer Figueira
Jennifer.Figueira03@rotman.utoronto.ca

2003 (EMBA 20)
Co-Class Champions:
Rob Carver
Robert.Carver03@rotman.utoronto.ca
Cindy Smith
Cindy-Smith03@rotman.utoronto.ca
Hai (Frank) Ye is a manager in the component business management board in the Shanghai Automotive Industry Corporation (Group) in China. He began his new career in the headquarters origination at Coventree Capital in Toronto.

2004 (EMBA 21)
Co-Class Champions:
Fariba Anderson
Fariba.Anderson04@rotman.utoronto.ca
Paul McKernan
Paul.McKernan04@rotman.utoronto.ca
Fariba Anderson reports, “On the news front, the Manta Group was selected again as one of Canada’s emerging growth companies by the Profit Magazine. The ranking known as HOT 50 can be found in the October issue of Profit Magazine. Start-up companies can only qualify twice to be on the HOT50 ranking as the measurement is based on percentage of revenue growth form year 1 to year 3 and year 2 to year 4. So basically one is no longer a start up once in the 4th year. Of noteworthy accomplishment is that fact that we were among a handful of companies that turned profit since our inception. Most companies ranked by HOT50 show a loss despite significant revenue growth. The Manta Group is owned by me and my two other partners (Will O’Brien & Ash Allagh).”

2005 (EMBA 22)
Class Champion:
Michele Henry
Michele Henry04@rotman.utoronto.ca

2005 (EMBA 23)
Co-Class Champions:
Karen Sparks
Karen.Sparks05@rotman.utoronto.ca
Joyce Rankin
Joyce.Rankin05@rotman.utoronto.ca

2006 (EMBA 24)
Co-Class Champions:
Elizabeth Duffy-MacLean
E.DuffyMaclean05@rotman.utoronto.ca
Linda Jussaume
Linda.Jussaume05@rotman.utoronto.ca
Sean Boyle is principal, structured finance origination at Coventre Capital in Toronto. Ian Mackenzie provided leadership at progressively higher levels for 26 years in the electricity industry with positions at Ontario Power Generation and Brookfield Power, before going out on his own as an executive management consultant. Ian specializes in advising or leading change initiatives, streamlining business processes, organizational design – staffing and accountabilities, and provides interim executive leadership to organizations needing to fill a short term need. Corrado Tiralongo has been appointed chief investment officer for Counsel Wealth Management and the lead portfolio manager of IPC Portfolio Management Ltd. As CIO, he will oversee Counsel’s investment policies and portfolio monitoring programs, including research, investment planning, ongoing due diligence, and risk management functions. Corrado established his career with two of Canada’s major financial institutions. He was most recently a senior portfolio manager with a bank-owned dealer overseeing the management of $16 billion in assets under management and ongoing due diligence process regarding over 25 external portfolio managers. Prior to that, he was part of the team that created and launched a wrap program for a bank owned asset manager.

2006 (EMBA 25)
Class Champion:
Rob Ljubisic
Rob.Ljubisic06@rotman.utoronto.ca

THANK YOU!
The 2nd annual EMBA25 Scholarship Golf Tournament held on September 27, 2007, was a huge success. Thank you to everyone who participated. The tournament raised an additional $12,500 for the EMBA 25 Scholarship in support of MBA students working in the not-for-profit sector. Under the leadership of EMBA25 alumni Neil King and Rob Ljubisic, the School has raised over $40,000 for this endowed award.

We are confident that we’ll reach our $50,000 goal for this scholarship before the new year. Should you wish to make a tax-deductible contribution, please contact:

Karen Papazian, Senior Development Associate
Tel: 416.946.3622
Email: karen.papazian@rotman.utoronto.ca.

2007 (EMBA 26)
Class Champion:
Serge Messerlian
Serge.Messerlian07@rotman.utoronto.ca

Aila Goderich is the founder of AG Investment Group. She sends best wishes to the Executive MBA class of 2007.

Patrick Merrin is managing director for Protechno/Handy & Harman in Riberac, France.

Dr. Isa Odidi recently ran for president of Nigeria. Dr. Odidi leads the New Democrats Party (the first ever Nigerian Political Party formed outside of Nigeria) and gained much Canadian and international press for his involvement in the electoral system. He also successfully challenged the Nigerian Electoral Commission on the legality of a dual citizen to run for political office. The constitutionality of this claim was challenged in a landmark case in front of the Supreme Court of Nigeria. Dr. Odidi was successful in his challenge.
Such a feat is a great accomplishment for every individual in Diaspora that seeks to gain a post in Nigerian political office. Beyond the political realm, Dr. Odidi is also the CSO/CEO of IntelliPharmaCeutics Corp (IPC) which is a successful pharmaceutical company, specializing in controlled-release drug delivery. He and his wife, Dr. Amina Odidi, are responsible for all proprietary drug delivery technology. The company has recently been featured on CNN and in other leading publications due to recent lucrative investments into the company by U.S. pharmaceutical heavyweight Par Pharmaceuticals.

**OMNIUM / GEMBA (Global Executive MBA)**

**1998**  
*Class Champion: Lan Nguyen*  
Lan.Nguyen98@rotman.utoronto.ca

**1999**  
*Class Champion: Jim Coutts*  
Jim.Coutts99@rotman.utoronto.ca

**2000**  
*Class Champion: Nancy Dudgeon*  
Nancy.Dudgeon00@rotman.utoronto.ca

**2001**  
*Co-Class Champions: Margaret Evered*  
Nancy.Dudgeon00@rotman.utoronto.ca  
*Renald Hennig*  
Renald.Hennig01@rotman.utoronto.ca

**2002**  
*Co-Class Champions: Manfred Koo*  
Manfred.Koo02@rotman.utoronto.ca  
*Petra Cerhan*  
Petra.Cerhan02@rotman.utoronto.ca

**2003**  
*Co-Class Champions: Michal Berman*  
Michal.Berman03@rotman.utoronto.ca  
*Petra Cerhan*  
Petra.Cerhan02@rotman.utoronto.ca  
*Andreas Helbig* is CFO and vice president finance at TÜV Rheinland of North America in Connecticut.  
*Antonio Torquato* is a senior manager with PricewaterhouseCoopers in Rio de Janeiro.  
*Andreas Vollmer* is a senior associate with Booz Allen Hamilton in Frankfurt.

**2004**  
*Co-Class Champions: Ralf Martinelli*  
Ralf.Martinelli04@rotman.utoronto.ca  
*Brent Furneaux*  
Brent.Furneaux04@rotman.utoronto.ca  
On May 5, 2007 *Uwe Leopold* married his beautiful wife Daniela at Lake Traunsee in Austria. “Thank you to every GEMBA grad for all the wishes and presents. It was the best day of my life!” In June 2007, Uwe switched from KPMG to PricewaterhouseCoopers in Rio de Janeiro.

**2006**  
*Class Champion: Cecilia Mueller-Chen*  
C.MuellerChen06@rotman.utoronto.ca  
*Cecilia Mueller Chen* has moved from private banking to life insurance at Zurich Financial Services in Oerlikon and since July 2007, has taken on new responsibility as target market manager in strategic marketing on the country level in Switzerland. “It’s a tough saturated market where the overall pie is shrinking, and I am responsible for the banking portfolio and cross-sell initiatives for retail business. Zurich has just completed a turnaround and has considerable momentum and growth initiatives currently underway.”  
*Cyril Scholer* has started a new job as division controller for ABB Engineering (Shanghai) Ltd. “I am still very busy getting my feet on the ground. It’s great; I am responsible for the controlling of our robotics business in China which includes production, projects and service. Hence this basically covers the full range of all business aspects from supply chain/production to sales and project execution.”

**2007**  
*Co-Class Champions: Dirk Lohmann*  
Dirk.Lohmann07@rotman.utoronto.ca  
*Simardeep Gill*  
Simardeep.Gill07@rotman.utoronto.ca

**MBA (ACCOUNTING) / MASTER OF MANAGEMENT & PROFESSIONAL ACCOUNTING**

**1991**  
*Adam Bryk* is an associate partner with Deloitte in Toronto  
*Leena Mathew* resides in Burbank, California and works for The Walt Disney Company as director of worldwide theatrical film distribution, stage plays, Miramax Productions and puppets. Her primary role involves managing people as support for financial activities and new business developments. Leena also serves on the board of directors as the finance chair for The Boys & Girls Clubs of America (Burbank chapter). Her interests include international travel (she recently returned from South Africa), shopping whenever possible, and enjoying life in California. Her favorite quote: “We cannot all do great things, but, we can do small things with great love” by Mother Teresa.

**1994**  
*Class Champion: Chris Hind*  
Chris.Hind94@rotman.utoronto.ca

**1996**  
*Co-Class Champions: Vanessa Blumer*  
Vanessa.Blumer96@rotman.utoronto.ca  
*Blake Langill*  
Blake.Langill06@rotman.utoronto.ca  
*Janet ScarPELLi*  
Janet.Scarpellis6@rotman.utoronto.ca

**1997**  
*Toni Vanderlaan* is vice president at PricewaterhouseCoopers in Toronto.

**1998**  
*Class Champion: Melody Tien Grewal*  
Melody.Grewal98@rotman.utoronto.ca

**1999**  
*Class Champion: Jamie Ferguson*  
Jamie.Ferguson99@rotman.utoronto.ca  
*Jason Wein* is manager at SBLR LLP in Toronto.

**2000**  
*Deborah Abrahams* is now director, business analysis at Lorex Technology Inc. in Markham.

**2001**  
*Class Champion: Elaine Ilavsky*  
Elaine.Ilavsky01@rotman.utoronto.ca

**2002**  
*Class Champion: Ali Spinner (Charyk)*  
Ali.Charyko2@rotman.utoronto.ca

**2005**  
*Michael Kogan* is an investment banking analyst in the Toronto office of Canaccord Adams. He recently passed his CFA Level 3 exam.  
*Alex Pekurar* is an auditor with Smith Nixon LLP in Toronto.

**2006**  
*Haiwei (Hemingway) Wu* is a senior staff accountant at Ernst & Young in Toronto.
Upcoming Events

Complete details are available at www.rotman.utoronto.ca/events

January 2008

January 15, 5:00-6:15pm
Rotman Operations Strategy Speaker Series
Speaker: Mark Foote, (MBA 91), President and Chief Merchandising Officer, Loblaw Companies Limited

February 2008

February 13, 5:00-6:15pm
Martin Prosperity Institute @ Rotman Speaker Series
Speaker: Gordon Nixon, President and CEO, RBC Financial Group and “Canada’s Outstanding CEO of the Year for 2007”

February 21, 22 and 23, 2008
annual Rotman International MBA Trading Competition

March 2008

March 7, 5:00-6:15pm
annual International Women’s Month Lecture @ Rotman
Speaker: TBA

March 13, time TBA
Forum on U.S./Canada Exchange Rates
Keynote Speakers: David Dodge, former Governor, Bank of Canada
Alan Greenspan, former Chairman, Federal Reserve Bank

March 14, 12:30-6:00pm
annual Rotman MBA Leadership and Social Change Conference and Career Fair
Keynote Speaker: Tom McAllister , (MBA 82), President and CEO, KidsHelpPhone

March 26, time TBA
annual Rotman MBA Finance Association and Rotman MBA Asset Management Association Case Competition

April 2008

April 7, 5:00-6:15pm
annual World Health Day Lecture @ Rotman
Speaker: Alan Bernstein, Executive Director, Global HIV Vaccine Enterprise

April 10, 6:00-7:30pm
Rotman Master of Finance Speaker Series
Speaker: Richard Lindsey, President and CEO of the Callcott Group, LLC; Chairman, International Association of Financial Engineers

May 2008

May 29, 6:00-11:00pm
annual Rotman Alumni Reunion Gala
Place: Four Seasons Hotel Toronto
Details: 6:00-7:00pm, reception in honour of the MBA classes of 68, 88, 98 and 03 to celebrate their 40-year, 20-year, 10-year and 5-year Reunions, 7:00-8:30pm, dinner, open to all Rotman alumni and guests, 8:30-11:00pm, dancing

May 30, 8:30am-4:30pm
10th annual Rotman Life-Long Learning Conference
Topic: “Thinking About Thinking” Place: Four Seasons Hotel Toronto
Speakers: Dan Ariely, Professor of Behavioral Economics, Fuqua School of Business and Author, Malcolm Gladwell, Staff Writer, The New Yorker Magazine and Author, Roger Martin, Dean and Professor of Strategic Management, Rotman School and Author, Anita McGahan, Professor of Strategic Management, Rotman School and Author, Jane Fulton Suri, Co-Chief Creative Officer and Director, Human Factors Team, IDEO and Author, Gerald Zaltman, Professor Emeritus of Marketing, Harvard Business School and Author
Thinking About Thinking
10th Annual Rotman Life-Long Learning Conference

Register now for our 10th Annual Rotman Life-Long Learning Conference on May 30. The theme is “Thinking About Thinking.” We’re pleased to offer:


“Predictably Irrational: The Hidden Forces That Shape Our Decisions” Dan Ariely, Professor of Behavioral Economics, Fuqua School of Business, Duke University and Author, “Predictably Irrational: The Hidden Forces That Shape Our Decisions” (Feb 2008)

Confirm your attendance today by registering at www.rotman.utoronto.ca/thinking
We look forward to seeing you on May 30th!