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The world is not responding to our attempts to control it with quantitative models. Our chaotic environment demands a new approach that pays attention to *qualities* in addition to *quantities*.

by **Roger Martin**

WE LIVE IN A WORLD THAT IS PREOCCUPIED with predictability and enraptured with quantitative analysis. In the realm of business, the evidence is clear: forecasters crank out precise predictions of economic growth using massive econometric models, and CEOs give to-the-penny guidance to capital markets on the next quarter's predicted earnings. In the world of health care, geneticists sequence the human genome and predict the elimination of numerous diseases. In our day-to-day lives, we are governed by adages like "Show me the numbers" and "If you can't measure it, it doesn't count."

Where has this obsession gotten us? Not far, I would argue; the economists, for one, have gotten it consistently wrong. As late as

the middle of 2008, none of the world's leading macroeconomists or forecasting organizations were predicting that the economy would shrink that year, let alone that it would crater as disastrously as it did. But undaunted, the same economists who totally missed the recession turned back to the same quantitative, scientific models to predict how the economy would recover, only to be mainly wrong again.

Likewise, CEOs continue to give quarterly guidance based on their sophisticated financial planning systems and they, too, continue to be wrong – getting slammed not for bad performance but for their failure to predict performance exactly months ahead of time. And in the health care realm, once the human genome was

sequenced, the scientists who predicted the solving of the world's medical mysteries had to admit that the entire project raised more questions about the complicated interaction among genes than it answered.

Our deep-seated desire to quantify the world is not surprising: given the complexity we face on a regular basis, we naturally seek ways to understand and control whatever we can. But the world is not responding well to our attempts, making it clear that it refuses to be organized, understood and controlled in a purely quantitative fashion. Not unlike a spirited race horse, the harder we tug on the reins to control it, the more it resists the bit to prove a point: it is not a machine that responds the way a user manual suggests it will; rather, it is an intensely complicated, ambiguous system of systems that defies comprehensive quantification. Such an environment demands a lesser-known form of analysis; one that pays attention to *qualities* rather than just *quantities*.

The Quantitative vs. the Qualitative Paradigm

There is no denying the strengths of the quantitative paradigm: when used in a suitable context, its methods produce reliable data. However, the paradigm breaks down when the phenomenon under study is either complex or ambiguous to any significant degree. The greatest weakness of the quantitative approach is that it decontextualizes human behaviour, removing an event from its real-world setting and ignoring the effects of variables not included in the model.

It would be lovely if, when setting out to predict Gross Domestic Product, macroeconomists could simply add up all existing loans to determine 'credit outstanding' and then plug those quantities into an economic model. But it isn't that easy. Unfortunately, as we found out in 2008, not all loans are the same, and some – especially subprime mortgages – aren't worth the proverbial paper they're written on. Life would be so much easier if, when trying to predict next quarter's sales, CEOs could simply extrapolate from last month's sales. But it may well turn out that those sales aren't as solid a base for growth as we'd hope – especially if the customer relationships underpinning them are weak. Likewise, it would have been fantastic if, after the genome was sequenced, scientists could have said 'This particular gene causes Lymphoma and this one causes Alzheimer's.' But it didn't turn out that way.

The fundamental shortcoming in each of these examples is that they depend entirely on quantities to produce answers, and in so doing, they are blissfully ignorant of qualities. As education scholar **Elliot Eisner** has pointed out, "Not everything that matters can be measured, and not everything that can be measured matters." Unlike quantities, qualities cannot be objectively measured. We can count the number of people in a room, but that tells us nothing about the qualities – upbeat, flat, intense, contentious – of the group's interaction. We need to better understand the role of

qualities to help us navigate the ambiguous and uncertain world in which we live.

Unfortunately, garnering an understanding of and a facility with qualities is a real challenge, given the sharp swing that our formal education system has taken toward quantitative thinking. As Rotman Adjunct Professor **Hilary Austen** has pointed out: "Results on tests with right and wrong answers clearly rank us against other members of our class. Quantitative thinking allows us to be precise and to share understanding; we use it to define fairness and rationality and effectiveness, and it is this utility that has led so many people to equate it with intelligence."

The allure of defining intelligence as equivalent to quantitative thinking has led higher education to force millions of students to take the SAT, MCAT, LSAT or GMAT to earn their spots in a university or graduate school. Whether purportedly testing Mathematics or English, these tests are dominantly assessments of single-answer problem solving. And despite their rather famous inability to predict anything about the likely life-performance of the test taker, these tests are sacrosanct. Prospective students tend to become a single-point, uni-dimensional creature in the eyes of admissions departments – as in "She *is* a 750 GMAT", not "She scored 750 on her GMAT."

Unfortunately, that is just the beginning of this obsession for students. Typically, once the walls of higher education are breached, yet more quantitative tools, models and methodologies are poured into the minds of our students, and more single-point-answer testing ensues to ensure that the quantitative toolbox provided is both usable and well-used. As a result, the majority of students graduate capable of using their newly-gained conceptual knowledge as a recipe or paint-by-numbers kit to produce analyses that tell them what is right and wrong, true or false. And if they happen to graduate in one of the so-called STEM fields (Science, Technology, Engineering or Mathematics) the **National Research Council** (NRC) and the **National Science Foundation** (NSF) will jump for joy because these are the fields that they have declared to be of most import to a country's competitiveness in the world.

The NRC and NSF may indeed be right that we are producing too few STEM graduates – though there is (ironically) no particular quantitative evidence given to buttress the claim. Not surprisingly, whenever comparisons are made, the relative quantities of STEM graduates are presented with no regard to their qualities. But if indeed the challenges of the world are increasingly going to feature ambiguity, complexity, uniqueness and indeterminacy – which all signs point to – STEM training *per se* will not be our salvation. A different form of intelligence needs to be built up to handle the unique problems we face, and that is qualitative intelligence.

As Hilary Austen describes it: "Whenever you allow action to generate outcomes rather than use action to pursue pre-established goals; whenever you reason with sensory experience rather than with abstract symbols; whenever you act without hesitation with

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what you know, while courting the possibilities of surprise; and whenever you use a combination of immediate and remembered experience to predict and then revise immediate action – you are exercising qualitative intelligence.”

For Austen and others, including the late management scholar **Donald Schön**, qualitative intelligence is synonymous with artistry and is at the very heart of excellence in any profession. As Schön once said, “The artistry of painters, sculptors, musicians, dancers and designers bears a strong family resemblance to the artistry of extraordinary lawyers, physicians, managers and teachers. It is no accident that professionals often refer to an ‘art’ of teaching or management.”

A Growing Demand for Artistic Capacity

Effectively dealing with the challenges of the modern world – rather than with narrow sub-segments of them – demands artistic capacity. Without the explicit development of qualitative thought, sophisticated mental operations like judgment in the face of uncertainty, coping with ambiguity, balancing consequences, and responding effectively to surprise will remain elusive. No matter what we do for living, we need to be able to go beyond using our knowledge as a recipe and aim higher than crunching quantitative data to produce single-point answers.

To some, this may seem an extreme claim, and of course, there are many legitimate and conflicting views on the subject. Implicitly, institutions such as the NRC and NSF see the situation differently, and countless popular management books have been written exhorting business people to become even more analytical and quantitative in their approaches. But from my vantage point of business strategy and management education, I have become utterly convinced that we need to train and develop ‘business artists’ more than we need to develop business analysts.

While it has not always been a popular view, more and more business executives are seeing the shortcomings of a quantitative-obsessed world. In June of 2008, I interviewed **Scott Cook**, the cerebral founder of **Intuit**, on stage at a design conference in San Francisco. In a reflective mood, he freely admitted: “What I

learned about the old style of business – about analytic and deductive models – [is that] it’s no longer up to the task. I find it destroying value, instead of creating value.” Cook was not disparaging his company’s ability to crunch the numbers, but indicating that it just wasn’t enough anymore: his people needed to observe more, and to let themselves be surprised.

Cook shared the story of the origins of QuickBooks, the product that transformed his company and drove its tremendous growth. Prior to QuickBooks, Intuit’s leading product was Quicken, a personal financial management program. Early consumer research showed that half of Quicken users were using it not at home, but at the office. It was a curious finding, one the company at first chose to explain away as meaningless or just plain wrong. “We ignored it,” Cook says “and continued on our merry way.”

But the same strange result kept showing up and after a few years, Cook decided to stop ignoring it. He set out to investigate, visiting and talking to users to figure out what was going on. His team discovered that there was indeed a large segment of customers using the product in ways Intuit had not intended. These were small businesses that chose to use the simple, friendly Quicken personal software instead of complex professional accounting software. Conventional wisdom was that these businesses wanted and needed traditional debit-and-credit accounting software – and so nothing else was available to them – until Quicken.

Faced with this new understanding, Intuit could have continued ahead as it had before, focusing on the home user and enjoying the additional boon of these newly-discovered office users. Instead, Cook and his team chose to embrace the surprise. “I’m a big believer in savoring surprises,” he says. “If something emerges that’s really a surprise – upside or downside – generally, this is the real world speaking to you, saying there’s something that you don’t yet understand. And in that thing that you don’t yet understand could come a major mindset change, a paradigm shift that could rock your world.”

So it was for Intuit. It created a Quicken-like, easy-to-use financial management software specifically targeted to the needs of small businesses, and within a month, it was the market leader. Only by

In **Design**, there is never one right answer. It's a very different view from **Science**.

cultivating surprise and being willing to imagine new and different conceptions of its customer was Intuit able to build on and maintain its success. Cook summed up the transformation as follows:

"We've had to swing the pendulum drastically from a deliberative, top-down model with lots of debates and PowerPoint presentations to an emergent model – where solutions and decisions emerge from individual action based on observation and experimentation, not based on what the boss says. And the more I see patterns in successful firms, the more I see that this is actually underneath it all."

At the same conference, I held an on-stage discussion with **Claudia Kotchka**, who masterminded a similar pendulum swing at **Procter & Gamble**. In explaining how the most qualitatively sensitive designers differed from her more quantitatively-driven colleagues at P&G, she commented: "(Designers) don't look for 'the' answer, because in Design, there is no one right answer. It's a very different view from Science."

What are the implications of the insights of Austen, Eisner, Schön, Cook and Kotchka for business and for management education? The key message for business is to learn to appreciate qualities. That means not obsessing about measurement so much that you exclude essential but un-measurable qualities from your understanding of a given situation. Consider the possibility that if you can't measure something, it might very well be the most important aspect of the problem on which you are working. Across industries, business people must strive to understand the qualities as much as the quantities of the environment in which they work.

In closing

I will leave you with three pieces of advice regarding the qualitative paradigm. First, I hope it is now clear that decision making is not only about equations and symbols. We must use all of our senses as we form opinions and make decisions. Numbers can help to describe sensory experience, but they cannot serve as a substitute for it. Former P&G Chairman and CEO **A.G. Lafley** – one of the

best CEOs in the world during his tenure – once told me: "The analysis never tells you the answer. The best it can do is inform your judgment in a helpful way. If you expect the analysis to give you the answer, you will be disappointed with the answer you get."

Second, never dismiss strong feelings that you have but cannot explain. In areas in which your qualitative capacity is nascent, your feelings will run ahead of your ability to explain them to another person – largely because you cannot yet explain them to yourself. But that doesn't mean that they are wrong. The task, rather than dismissing these feelings, is to integrate them into your quantitative analysis.

Third, cultivate surprise and learn to embrace it. If the course of action you have chosen – i.e. your model – produces an outcome that you didn't expect, don't get upset and throw out the experiment. Instead, learn from it and adjust your model.

All of this poses a stiff challenge for both organizations and management education, which have been set up to develop and worship quantitative models and findings. At the moment, professors, students and pedagogy are not oriented toward the development of qualitative capacity. But educating only half of a student's brain is a crying shame. We must embrace the education of the full mind – the analytical and the artistic, the quantitative and the qualitative. Students need to learn how to think critically and creatively every bit as much as they need to learn how to crunch numbers. In the end, that is the only way we will create leaders that are capable of facing our toughest problems and answering our most difficult questions. **R**



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