JPS INTERVIEW

A Conversation with Rotman's Roger Martin

Roger Martin is the dean of the Rotman School of Management at the University of Toronto, where he is also a professor of strategic management. Before taking up the dean's post in 1998, Professor Martin was a director of Monitor, where he served as co-head of the firm and founded and chaired Monitor University. He is the author of many articles as well as The Responsibility Virus, *a book on what "true partnership" means;* The Opposable Mind, *on integrative thinking, or the ability to eschew choosing between two opposing models in favor of creating a new one that is better than each;* The Future of the MBA *(with Mihnea Moldoveanu); and, most recently,* The Design of Business, *which sets out his views on why — and how — companies must move beyond analytical thinking to "design thinking" if they are to thrive. Recently, the* Journal of Problem Solving *spent some time with him.*

Journal of Problem Solving **Professor Martin, over the last few years, most significantly with your recent *The Design of Business*, you have been associated with design thinking. How do you define design thinking?**

Roger Martin I think of design thinking as combining the best of *analytical thinking* — that is, thinking based on declarative logic whose purpose is to declare a proposition to be true or false — and *intuitive thinking*, which is knowing without reasoning. Analytical thinking attempts to prove that something is indubitably true. Intuitive thinking is about imagining a future that cannot be proven in advance.

What, to your mind, makes this combination necessary – that is to say, what makes design thinking important?

Well, most obviously, companies have to deal with the future, so they need a way to think about the future. Unfortunately, what most companies are expert in is analytical thinking. And analytical thinking is all about the past — you cannot analytically demonstrate that anything in the future will happen. At the same time, you can't ask companies simply to embrace intuitive thinking, because in a corporation that has to operate without driving into the ditch, intuitive thinking is too unsystematic.

That's why the combination is important. More specifically, design thinking is a form of thinking that adopts the abductive reasoning element of intuitive thinking—what the philosopher Charles Sanders Peirce called a "logical leap of the mind" or "inference to the best explanation."[1] Analytical thinking deals in deductive thinking, in which we *deduce* specific conclusions from general statements we know to be true, and in inductive thinking, in which we assert a general conclusion on the basis of a large series of specific facts or events. Abductive thinking is what Peirce called a third type of thinking, in which we imagine the possibility that something might be true based on a small number of facts—or even just one. For instance, you may be walking along and see something and say, "That's weird, that doesn't fit any rule or model, that's the only time I've seen that." You can, if you wish, ignore it—you certainly have no statistically significant sample size to base a conclusion on. Or you can attend to it, and make an inference to the best explanation for it. That is abductive thinking. So design thinking takes the abductive element from intuitive thinking and supplements it with deductive and inductive logic from analytical thinking, thus allowing you to imagine the future, and then create experiments that will allow you to prove (or disprove) it by more conventional methods.

What happens if a company seeks to apply only analytical thinking to the future?

Well, the future is rarely completely different from the past, so what most companies do, which is honing and refining what they have always done—enhancing consumer experience in incremental ways, say—is a good thing. The problem is, they must link this to an element of intuitive thinking, or they can't make serious moves forward rather than just incremental ones. Where you will particularly get into trouble is if you are busy honing and refining your offering while the world is changing, and you ignore scattered warnings about change, because they aren't yet systematic enough for your information systems to register them.

Can you offer an example of how design thinking might help a company that would otherwise go wrong?

Let's say you are a company that's always had happy customers because you give them good variety and on-time delivery, all at a reasonable price. And some customer, a big customer, cuts you off and says, "Sorry, no, we've changed suppliers." You say, "Whoa, what's that all about?" But it's only one, so you can't use inductive logic that generalizes from particular experiences to say, "Many customers are cutting us off for this and that reason." And you can't use deductive logic because what has just happened doesn't follow any

1 Charles Sanders Peirce was a contemporary of the American philosopher William James. Both were advocates of the pragmatic school of philosophy (of which Peirce was the founder).

of the rules you have developed that tell you that if you do three or four things right, customers are happy and will stay. You did these things, and still this customer left. So what many analytical-thinking companies do is ignore the data until there are a statistically significant number of customers that have left for a given reason — by which time it is often too late.

A design-thinking company, by contrast, would say, "Wait, we've just lost a big customer. That matters. Let's try to infer the best apparent explanation so we can understand how to prevent losses of this sort."

But most companies have systems in place to ask customers why they are canceling their order, or their contract, or whatever it is. Why won't that do the trick? Why do we need abductive thinking or design thinking?

The problem is that, in the analytical-thinking model, the person asking the question typically has a form that will attempt to categorize the customer's response into one of the company's recognized reasons for canceling. So if the customer says something out of the box, even the well-trained person won't know what to make of it — and it will get ignored.

Let me ask you this: how many times do organizations look at the "verbatims," the actual records of those conversations, to figure something out? Senior management wants this week's aggregated printout of the reasons for discontinuing, because that's their model for looking at why people disappear. And any free-text comments respondents add to multiple-choice answers on surveys get lost if you aren't reading the verbatim responses.

This is one of the things I wrote about in *The Opposable Mind*, about A. G. Lafley's move from regular to compact detergents.[2] Based on the well-honed tests P&G carried out on new ideas, consumers did not exhibit a strong preference for compact detergent. For a master of consumer understanding such as Lafley, the test data should have doomed compact detergents. But that idea didn't sit right with Lafley. Lafley saw that, unlike most product upgrades, this one seemed to have the potential for massive cost savings for retailers, both in warehouse and store shelf space, and similarly for P&G, too. So Lafley went beyond the quantitative data to pore over more than 400 handwritten verbatims and concluded that, while consumers were not wildly enthusiastic, few were actively hostile, and more than 80 percent cited at least one positive thing about compact detergents.

Lafley then followed up his "logical leap" with some more detailed analysis based on his knowledge of retailers' thinking about warehouse space and so on — thus combining the abductive element of intuition with more conventional thought processes — and confirmed the massive cost savings that compact detergents would generate. All this, completely ignoring the company's formula, which was that a product had to be a blind-test winner by such and such a margin or it wouldn't succeed. More importantly, had

2 Lafley served as P&G's Chairman and CEO, 2000–2009.

Lafley championed only the quantitative research, he would have dropped the idea. But had he championed only his intuition, he would have been without the analytical detail about the company's and its customers' savings necessary to keep the idea alive to fruition.

He imagined a fundamentally different future, and one that turned out to have epic business implications. All of this came from reading the verbatims. Only after the abductive leap did any analytical thinking come into play, allowing Lafley to generate an analytically defensible prediction about the future that differed greatly from the past.

That's a great example. But it's also one about a single insight from a CEO with decades of experience. One of the things obviously relevant to firms more broadly is how to make abductive thinking—what I imagine is generally thought of as "innovation"—happen much more routinely and more widely across the organization. What do you think of the model that has been practiced at places like Google and 3M, in which certain employees are required to spend some nontrivial percentage of their time simply seeking out innovative ideas?

That's not a bad model. Of course, it's *au courant* because of Google. Mainly, however, it's a good thing because it is a signal that the company cares about ideas whose success cannot be proven in an analytical fashion. But the proof of the pudding is in what happens after the ideation process. If someone comes up with a big "Aha!" and goes to their boss and says "Let's commercialize this," and the boss says "No, you haven't proved your goofy idea," then all that intuitive thinking won't really matter.

Part of intuitive thinking is getting away from 'Prove it!' I'd have senior people trained to drop that terminology.

So what is the ideal environment that you would put people into to make intuitive thinking happen?

Intuitive thinking is difficult—part of intuitive thinking is getting away from "Prove it!" I'd have senior people at any company, including yours and my old one, trained to drop that terminology. Of course, there are some things you *do* want to prove—when a consultant says we can reduce costs by 3 percent, you do want to prove that. But when it comes to new ideas, I think, if a junior person comes forward with an intuition that could yield results, I'd have the senior person say "Here's what I'd love you to think about: how could we design an experiment we could run and see if it works, and do it in a way that won't damage or embarrass us (or, if it's a consulting project, us or the client), and figure out a way of prototyping your idea"—then you have a chance of getting the kind of innovation you want.

Of course, openness to experimentation and prototyping requires great flexibility as to timeliness and even processes. Certainly we do plenty of both ourselves when our work calls for it. But what would a multi-thousand or multi-ten-thousand-person firm do to introduce design thinking *routinely* into its work?

It's tough. It's a challenge. Frankly, I think it is your own biggest challenge over the next ten years. The biggest threat to traditional consulting is an awakening in companies to the limits of analytical thinking. You, preeminently, and your immediate competitors BCG and Bain offer truly high-quality, distilled, refined analytical thinking. The biggest challenge doesn't come from one another. As far as I can see, it comes from companies beginning to feel that analyzing options in a sophisticated fashion and seeing that A is better than B or vice versa is not what they truly need. What they need is someone who helps them imagine futures. Not that McKinsey doesn't do that, too. But I think you do it in a way that doesn't stray so very far from things that can be proved through inductive and deductive logic.

Well, if I may touch on a controversial matter, I believe you recently expressed just this feeling about us and our immediate competitors in a business publication – in rather robust language that suggested we weren't as far down the innovation learning curve as we might be. For ourselves, I think we'd point to an active innovation practice that includes partnering with IDEO, a firm of the kind to which you feel the future may belong, our own internal design labs, teardown labs, and so on. We actually have a manufacturing plant where we help clients design or redesign not just products and services, but the entire systems through which they operate their companies. It won't surprise you, of course, to hear we have lots of demand for that kind of thing. I assume at least some of that is new to you?

Yes, one of your senior partners among my acquaintance shared some of that with me. I'm actually glad you mention it. I fear that, in that interview, the combination of some rather casual remarks on my part and the inevitably selective nature of the reportorial process may have given an impression I'd be happy to correct. I do see that McKinsey is both aware of and responding to a heightened need among its client base for innovation.

What I'd really want to urge is that you emphasize that part of your practice much more — as much as possible — as I really do think, to use your phrase, that the future belongs to that kind of consulting.

That's very helpful. Of course, I do hope our 80-year history stands as compelling evidence of our ability to change with our clients.

Yes, I think it does. Indeed, I think it is arguable that you are unique in the strategy consulting industry for having reinvented your firm multiple times. It is to your credit that you are on McKinsey 4.0 while it remains a challenge to many of your competitors to figure out how to go from release 1.0 to 2.0.

That's very gracious. But I have a follow-up question related to this perceived need for increasing attention to innovation – or design thinking, to return to your term. You are the dean of a business school and no doubt see intellectual trends in business come and go. Why would you say this is happening now? Why has a need for design thinking emerged in the last few years?

I think it's emerging because of the intensification of competition and competitive cycles. The way I think about it is that the tried-and-true method for a big multinational company to make money in the 20th century was to have a breakthrough idea and have customers say, "That's great," and then the company would spend the next 40 years exploiting that one idea. I say exploiting very purposefully. In *The Design of Business* I talk about the difference between *exploiting* an idea through the ever-more-reliable provision of a product, which is driven by analytical thinking, and *exploring* for new ideas, which is driven by abductive thinking. In the last century the need to explore for the next new idea wasn't all that important because you could exploit an idea for 40 years. In some categories, you could invent Canadian Club whiskey or Bacardi rum and they would be the same 90 years later and you would still be making money.

The balance between how much of your corporate efforts can go into exploitation of old ideas and exploration of new ones is changing.

What I think is happening now is that the cycle time is shrinking. So the balance between how much of your corporate efforts can go into exploitation (which requires reliability) and how much must go into exploration (which requires validity, which in turn requires abductive logic) is changing. Unless you do much more exploration, you will expire. It's the increasing intensity of competition — new, offshore, lower-cost providers, more open markets, and so on — all these things ripple through into resetting the balance of time, money, and energy between exploitation and exploration.

I think you have just condensed much of your book into about 50 words. For the sake of our readers, can I ask you to talk briefly about the relationship of exploitation and reliability and exploration and validity, and how abductive logic – and, indeed, design thinking – fits in with them?

Well, one of the fundamental ideas in *The Design of Business* is the knowledge funnel. At one end of the funnel is the idea of a mystery—some problem to which the answer is not yet known. Exploration of the mystery takes you some way toward solving it—specifically, takes you along the knowledge funnel to the point of a heuristic, a rule of thumb that works the mystery down to a manageable size. It simplifies the mystery, and allows those who understand the heuristic to apply it to help them solve the mystery in whatever form it manifests itself. Eventually, if an organization studies a heuristic intensely, it can convert it from a rule of thumb to an algorithm—a series of steps or inputs that, if followed in sequence, guarantee the desired solution will emerge as an output. The ultimate example, of course, is computer code, which is why the general use of the word is in connection with software.

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The key is that it is abductive thinking that gets you from mystery to heuristic, by making the inference from the puzzling data in front of you to the best explanation. This is the realm of the designer, who deals in *validity*—he is searching for a *valid* answer to the mystery. (I should add that this is a technical rather than a lay definition of validity.) As such, he—and validity in general—is focused on the future. The mystery exists in the present, and the designer imagines a solution that must be tested and found valid. It cannot be proven by invoking anything in the past. It is new, and nothing new can be understood, and no new product or service can be created, without someone somewhere working through this process.

At the other end of the funnel, however, is where most established corporations operate. They have taken a long-since-solved mystery—they are often, but not always, the ones who solved it many decades ago—and have spent the intervening decades refining the resultant heuristic into an algorithm. They deal in *reliability*—the reliable reproduction of the desired outcome again and again at the largest possible scale at the minimum cost and with the minimum variation. As such, reliability is focused on the past, and applies and reapplies things that have been proven down to the minutest degree of tolerance imaginable. But, as I have said, I believe the balance must now shift significantly back in the direction of exploration. Profits from the algorithmic exploitation of a previously solved mystery must be plowed back, at a much higher level than is currently the case, into new mysteries, if established companies are not to find their competitive advantage suddenly eroded by a new player that saw a better answer, or solved a different problem that made the old problem irrelevant.

Well, that's a terrific summary of much of the book, and I will note for our readers that the book itself is terrific, and that they should not take that

paragraph, or indeed this interview, as a substitute for it. But let me play devil's advocate for a moment. You talk of a much increased need for exploration. What would you say to a CEO who says his company spends billions of dollars on R&D every year?

I'd say, "Go and hang out in the R&D department and look at the degree to which they are really just honing and refining existing products." In many cases, the R&D department hones and refines, sustaining an innovation, rather than building a new business. I'd ask the CEO what it is about the way he or she manages a company that makes people think in the incremental way they do. After all, they all basically want to do what he or she wants them to do. So what is it that makes the people in R&D act the way they do, driving incremental improvements rather than radical invention? The answer is that, when they come to the boardroom, they are asked to "prove it." And you can only prove things deductively and inductively. So they are being told this is the only logic the company recognizes. They are trained to come forward only with "provables." You see, even though analytical thinking cannot say anything definitive about the future, it can get you pretty darn close to proving that if you add this little feature to your product, you'll sell a little bit more of the product. So that's what gets through, and that's what gets worked on in R&D.

Let me go back to your earlier question of how to make this happen in a big company. Ban the words "prove it." And encourage by your own actions what Charles Sanders Peirce called "a logical leap of the mind." Look at things that confuse you in the market—why are customers doing this or that? Make an inference to the best explanation. Do a lot more prototyping. Put a lot more things out there. Stop insisting on proof. You can protect yourself through proof —but someone out there will make an intuitive breakthrough, and you risk losing relevance. I would love to see McKinsey rise to that challenge—but I do think it's a pretty stiff challenge.

Obviously, we trust our organization is robust and flexible enough to rise to any challenge the market presents. And indeed, insofar as you are suggesting that today's leading consultancies are playing at the algorithmic end of the knowledge funnel, I would put it to you that many readers of *The Design of Business* would say we already do many of the things you recommend. For one, we tend to operate at the level of the heuristic: we employ pattern recognition to help us narrow down the scope of inquiry, and then seek to provide a solution for each client that suits its context at the time the study is performed. For another, you specifically recommend that companies move as far as possible from a "line" structure in which people have permanent, unchanging jobs, to a project structure, in which people move from project to project. That is a pretty good description of the

way we work. Are we doing better – in your own terms – than you perhaps give us credit for?

That's well taken. And in many respects professional service firms are stores of heuristics — that is, the senior people at McKinsey are a large group of people who are masters of a heuristic. That's not a bad thing. When people come to you, that's what they are after. By contrast, when they come to a direct-mail company, they are coming for an algorithm: "Here's who we want to reach most cheaply." And the direct-mail company runs the algorithm and does that for them. You don't need a McKinsey partner doing that for you. He or she counsels the direct-mail firm. If there are any algorithmic activities to be done, he or she has junior people and machines doing it.

There are many more people who can do 'five forces' analyses and relative-cost analyses and so on than there are people who can say, 'We have to make up a new way of thinking about this problem.'

But there are two things for which I would criticize consulting firms, because I don't think that's what's happening all the time. The first problem is making things more algorithmic than they ought to be so you can put more junior people on them. The second problem, and perhaps the more serious one, is that an algorithm has all the judgment taken out of it. You are converting a heuristic problem to an algorithmic one, and so giving a standard answer to a nonstandard problem. You see the same thing when consulting firms don't treat mysteries as what they are. Instead, they say, "Doesn't that look rather like this?" — treating the mystery as a heuristic. In both cases, it is because consulting firms have far more resources that are good at heuristics and algorithms than are good at staring into mysteries. There are many more people who can do "five forces" analyses and relative-cost analyses and so on than there are people who can say, "We have to make up a new way of thinking about this problem."

I suppose I would say that, at their best, consulting firms take the problem statement and treat it as the problem it is. But there is a tendency to treat it as the problem they wish it would be.

Is there a connection between this phenomenon and your conviction that there are kinds of problems business faces today that traditional problem solving may not be able to address, but that design thinking can?

I think so. These more difficult problems have to do with problems of newness and "first timeness." I remember 15 years ago, when people were bidding for mobile licenses in South Korea. The problem was, "What are cellular penetration rates going to be in Korea? What would the take-up be at various price points? What would the competition look like?" This was a new

industry. We simply didn't know. If you went and asked consumers who had never used cell phones, "How much will you use them and at what price," the best answer you could hope for is, "I have no clue and why are you asking me?" Worse was if people said, "I would use them this much at such and such an amount." How could they know? If you try to analyze your way to an answer in that sort of situation, good luck. It will be the wrong answer. You will have to make an inference to the best answer. And you do it by thinking of analogous situations that people might not even have noticed.

Well, I know we and I imagine every serious consulting firm reaches for analogies in a situation of that kind.

Yes, but not, I think, in a sufficiently "mysterious" way. You don't want to say, "Well, cell phones are like house phones that can go anywhere." You want to be doing anthropological studies of how fundamental habits change, and looking at how the spending of a middle-class person can change and how fast it can change when something comes along that they quickly realize is more or less indispensable. Furthermore, it would all be stuff with not nearly enough data points to apply good inductive logic to. It would be taking a shot in the dark.

Shots in the dark don't have a very high success rate. That doesn't sound like a very promising business model.

That's a good point. But a better point is that a shot in the dark — rather, I should say, an educated shot in the dark — is sometimes the best thing available to you. As Peirce would say, you have to take an educated shot of some sort. You try and triangulate using analogies to determine what situation the situation you are looking at might be similar to, and combine that with asking, "What would allow us to play and learn and lower our likelihood of getting killed while doing that learning?" And you do scenarios so you are not locked into one way forward.

Is it fair to suggest that there is a personality trait at work here – that some people are much more comfortable with this kind of thinking than others?

Yes. There is a side of me that says that, if a person has been told by age four or five to be right or don't do anything at all, they analyze and analyze because the cost of error is so high emotionally — as opposed to someone who has been signaled, "We like the way you think — you'll get a lot of things wrong but we like the way you think." But perhaps not. Perhaps the die is steadily being cast throughout your education — K-12, college, and graduate. You are increasingly informed that unless you are analytical,

your ideas have no worth. And you come out saying, "I am a trained analyst, Roger, and I'm uncomfortable with what you are saying here!" I suppose my belief is that these tendencies are shaped in early childhood and, because of the predispositions of modern analytical higher education, anyone started off in the "make sure you are right, don't make errors" direction has been thoroughly encouraged in that way of thinking. And by the time they are done, it's too late.

Of course, insofar as a company feels it suffers from this problem, that raises the question of what one can do. Can a trained analytical person simply give themselves the license to think out of the box and take leaps of thinking rather than just trying to be deductive or inductive?

Yes, that's right. But many wouldn't do so because they think it's "bad" or "immoral." Reliability-oriented people tend to look at intuitively oriented, validity-oriented people as being dangerous — they are, they think, not careful enough. I know that's a strong statement, but I do think it's accurate. Validity- and reliability-oriented people don't trust each other — it's a religious matter.

That's certainly a robust view. You suggested earlier that continuously increasing our ability to incorporate design thinking into our work was our biggest challenge. Is there, in closing, any other challenge you would point to?

Yes. I suspect, ultimately, it's the challenge of bigness. Bigness is not clearly a good thing for a consulting firm. As a consulting firm gets bigger, it's harder to keep on solving mysteries, and it's harder to use heuristics instead of algorithms. Consulting firms should recognize the cost of bigness. There is a dark side to it. What do you get if you are McKinsey as against another firm? You are much bigger than your competitors. So you can go in and say "We've done that 27 times before," and you have a case database that tells the team how to do the study. The plus is that you *can* treat the client's problem further down the funnel, which means you are more efficient — but the minus is that you may leave more of the client's problem out. And some clients do feel that their problem gets viewed similarly to someone else's problem, and so the same tools are used on it when it's really more unique. As you get bigger, you are more likely to push problems down the funnel. You have to lean against that. As companies get bigger they move toward reliability, and the CEO has to have a bias toward validity to push against that.

Because ultimately it's the mysteries that matter: clients will pay very handsomely for those who can help them solve their mysteries. That's the challenge — more mysteries, fewer heuristics, and no algorithms.