The Design of Business

roger martin

Well, I am honored to address this important group, and I must say I'm impressed with your broadmindedness in allowing a Dean of a business school to come and address a conference like this. I'll try to make some sense out of that and we'll see how I do.

Today I don't want to talk about the management of design which is a very popular management subject these days. I'd like to talk instead about some evolutions that are taking shape that make the design of business an important topic for designers and for business school deans. To do that I need to step back. Not too far back I hope but if you'll allow me a few moments, I'll talk about how our understanding evolves over time.

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Over the course of history, things have entered our collective consciousness as mysteries, things we observe, but don't really understand. Thus a long time ago, gravity was a mystery — we looked around the world and saw that most things seem to fall to the ground. Some don't, like birds and some like leaves seem to take forever and some like rocks fall quickly. Song is a mystery. What do people like to listen to? What makes them feel happy and contented? And art, as you would all know, the long battle to understand how to represent on a two-dimensional page what we see in three dimensions.

We start with mysteries and, at some point, enough thought goes into the question to result in some first layer or level of understanding. We develop a way of understanding the general principles of the mystery. We develop what's called a heuristic understanding, a rule of thumb or a set of guidelines for solving the mystery by organized exploration of the possibilities, rather than by following a strict set of rules. Why do things fall down? We develop a notion of a universal force called gravity that tends to pull things down.

Investigating sounds that people like to listen to, we learn about chords. Then we create song types like ballads or folk songs or the Blues and by following a set of guidelines we get something people will like. Now there's barely understanding a heuristic and there's mastering a heuristic and the difference would be between, Don McLean, writer of American Pie, the 1971 song not the 1999 movie, and Bruce Springsteen or Bob Dylan, authors of scores and scores of hit songs. For Don McLean, I would argue that it was a mystery, one inspiration that created one random event. For Bruce Springsteen on the other hand, a heuristic, a way of understanding the world, and the people in it, enables him to write songs that have great meaning to people and are immensely, enormously popular. For artists, early heuristics included perspective, the notion

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that you could have this thing called perspective that would help you take that three dimensional object and render it in two dimensions on a page in a way that doesn't look like an Egyptian version. Later there was the colour wheel, a way of thinking about colours that enables you to get better mixtures, better colours, colours that work together, in ways that they didn't before. These are heuristics. Of course they don't guarantee success. What they do is simply increase the probability of getting to a successful outcome. They represent an incomplete understanding of the mystery.

In due course, increasing understanding can sometimes lead to an algorithm. An algorithm is a logical arithmetic or computational procedure that, if correctly applied, ensures the solution of the problem. I can give you an algorithm for getting from here to the Rotman School. And in the case of gravity, from the mystery of why it is things seem to fall, to the heuristic notion of gravity, we eventually learn to calculate that falling things will accelerate at a rate of 9.8 m/s2. We can figure out how fast things will fall and offset that against the calculation of the wind resistance of a leaf.

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In song, Brian Eno synthesizes the heartbeat and determines beyond a shadow of a doubt that any song with a synthesized heartbeat as the rhythm track will be loved by listeners. I hate to be so all encompassing but it happens to be true. Out of which we got electropop and, eventually, Milli Vannilli. In art, we eventually get paint by numbers.

In the most recent modern era, I would agree that there's a fourth important step to this sequence: algorithms get coded into software. This means the algorithm, the strict set of rules that we have, is reduced to a series of zeros and ones, binary code, that enables a computer to produce a result. So if we go back to the example of gravity, the fact that we have an algorithm for how things fall means we can program an aircraft with autopilot and cause the plane to fall from the sky in an organized way — the way we want it to —so that it lands in the right spot. There's no longer any judgment involved, the plane lands on the basis of a series of ones and zeros because our understanding of gravity has moved from a mystery to a heuristic to an algorithm to computer code. Think about typesetting. How to express words in a pleasing way used to be a mystery. Then came the first heuristics, calligraphy. Then more sophisticated heuristics, different typefaces. But even as of 1981, when I was first courting my wife, Nancy, who was then a student at the Ontario College of Art and Design, students used Letraset to set typefaces by hand, How many people here have used Letraset? And I remember watching her doing these typesetting assignments over and over and over and asking her, very naively because I didn't know anything about what she was taking, why she had to do this? And she explained to me:

"Oh, Roger, in each typeface, because of the shape and size of the letters, the letters have to be different distances from each other to look correct."

I said, "Okay, I get that. But isn't it true that in every typeface, there are only a certain number of letter combinations, only a certain number of instances of a given letter being beside another letter?"

And she said: "Yes, yes, that's true."

And I said, "Well if in fact there is a rule that in, Helvetica, or whatever, the 'D' and 'E' have to be this far apart that seems to me to be an algorithm. And, I hate to tell you this Nancy, but I think eventually it will be coded, so I hope you are not trying to develop a career in hand typesetting."

This, I think, almost destroyed our relationship. I learned later that this is sort of a guy thing and you're not supposed to do stuff like that. But anyway, we survived and we are still married. In many cases, I am absolutely not right but in this case I was. Along came Adobe Illustrator and Quark, and they simply coded it. Hand typesetters were no longer needed, and the Letraset business, I think, has suffered considerably.

Of course this begs the bigger question, what, does this have to do with design, the design of business or even the price of tea in China? Let me take a stab at answering that question. I would argue that, broadly speaking, value creation in the twentieth century as a whole has been defined by the conversion of heuristics to algorithms, taking a fundamental understanding of a mystery, a heuristic, and driving it to an algorithm, driving it to a formula, and in so doing driving it to huge scale and scope. That created enormous value. Think of McDonald's. The McDonald brothers who sold their business to Ray Crock, a multi-mixer man — looked at a mystery: How do Californians want to eat in 1955? And they created a format for that; a fast service format, a heuristic. But that isn't what created enormous value. No, because in 1955, 1956 there were actually a lot of places in California that were doing similar things. Many places were discovering what Californians wanted and they discovered the other great truth of the twentieth century: what Californians want now, other people will want later. What made McDonald's different was they drove it to an algorithm, they drove it to a point where they could figure out exactly how to cook a hamburger, exactly how to hire people, exactly how to set up a store. They set up McDonald's university to teach the 57-step process for how to cook a hamburger. They drove it to huge size and scope so that we have McDonald's restaurants around the world.

This is repeated over and over in the 20th century. The same could be said for Ford with the assembly line, or Electronic Data Services, EDS, or training Cobol programmers and routinzing systems integration or Procter and Gamble, and blowing that out; Or Anheuser-Busch for how to market and sell beer, Frito-Lay for how to do potato chips on a vast scale and distribute them on a vast scale. All of this was massive algorithmization, which paved the way for massive value

creation in the 20th century. And what's required for that is turning judgment and the artistry involved in judgment into a formula. Now this dynamic, I'd argue, accelerated in the very late part of the 20th century, I from 1985 to 2000, when many things were being driven from algorithm to code. Let's get back to the example of typesetting, In Adobe and Quark, and Good Thing, even Word, there's a 'yes' and a 'no.' There's an incredible increase in efficiency and effectiveness, as my Nancy knows.

However, with the coding comes the end of judgment and the end of the 'what if' when you're utilizing it. The 'what if' is not a part of the pattern of zeros and ones. Those zero and ones have no soul, no artistry. So even though Adobe says 'D' and 'E' should be exactly so far apart in Helvetica, my designer friends still say that to get the exact effect you want, some kerning is required. Am I correct on this? [Audience: "Yes."] Yes, Thank you. But what is that? What is kerning? It's breaking the code; it's breaking the algorithm. So I would argue that the extreme of the 20th century of this is soulless numbers. This is not all bad and it is not all good. Like most things in life, it has some goodness to it and some badness to it. It is the reality of the relentless march of understanding, because only through the relentless march of understanding can we go rightward on this page, and with the relentless march of Moore's Law and the ever decreasing costs of information technology. So the question is: If this is the late 20th century, where do we go from here? Is it more of the same, more of the relentless drive toward more coding of what was mystery, heuristics, or algorithms? And my answer is, I don't think so. Now this is more speculative, but my view is, I don't think so.

"So the question is: If this is the late 20th century, where do we go from here? Is it more of the same, more of the relentless drive toward more coding of what was mystery, heuristics, or algorithms?"

I believe we are transitioning to a 21st century world in which value creation is moving back to the world of turning mysteries into heuristics. I see the beginnings of a fundamental backlash against algorithmization and the codification of the world around us. Against the drive to efficiency and effectiveness, to producing more stuff, whether or not that stuff is particularly wonderful, to reaching to grab the benefits of the economies of scale, but accepting of course the standardization and soulnessness that has to go along with the economies of scale. I think it's changing slowly but surely. Obviously, there are still trends that are heading down the same late 20th century path, but I think there is change in progress. I think we will look back on the 20th century as the century of producing stuff, lots of it, as efficiently as possible. That will be our memory of the 20th century far into the future, and it was a Tour de Force, of producing lots of stuff more efficiently than it was produced before.

However, I think the 21st century will go down in history as the century of producing elegant stuff. Stuff that delights users with the elegance of its utility and output, stuff that is produced elegantly, with the most elegant production processes, processes that have the minimal environmental footprint, for example. I think that on many many fronts the 21st century presents us with the opportunity to delve into mysteries and come up with new solutions, new heuristics. Mysteries like, how can big cities actually work? We're getting more and more of them. And in fact Toronto is not a big city in the 21st century world. It works well, I think relatively speaking. There are many cities around the world that don't work, and are working less every

day, and that's a mystery. How can people of different cultures learn to work together? How can big organizations maintain their sense of community? How can health care actually work when there's an infinite demand under constrained supply? These are the kinds of mysteries being presented to us for which there is no algorithm and no coding for even though people may try.

If we accept some of the premises of this argument, I think there are three major implications. And each has a whole lot to do with design, which is why I'm here to talk about it. Implication number one is that design skills and business skills are converging, and I would suggest it is arguable that they are going to become the same. As its heart, the design skill is to reach into the mystery of the particulars of a given situation that we don't understand, some seemingly intractable problem. It could be a problem of product design, an architectural design, a graphic design, a problem of some sort – that somebody brings to a designer. The designer takes the problem and applying creativity, innovation, and mastery makes it something other than a mystery, something defined as a heuristic, a way of knowing and understanding. But it won't be a formula, it won't be an algorithm, it'll be a heuristic. So I would argue that to be successful in the future, businessmen and businesswomen will have to become more like designers. More masters of heuristics than managers of algorithms. For much of the 20th Century they could move ahead, create enormous value, by being managers of algorithms, deploying. Now I think this chaqnge creates a huge challenge/problem, which will require completely new kinds of education, new kinds of training, and new kinds of experiences for businessmen and women to develop that skill. Why? Because the value of that skill has not been as obvious. I think skilled designers lead many of the world greatest businesses, they just don't know they are designers. They were never trained as though they had some inherent skill, so we don't have a stock of designers in the business world.

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The second thing, I would argue, is that we need a new kind of business enterprise. I believe the traditional firm will have to look much more like a design shop in a number of important dimensions. Excuse the following if I don't have it right, but this is my impression from working with a lot of design organizations and design shops. This is my view of a design shop versus a traditional firm. In the traditional firm, the flow of work life tends to be ongoing tasks and permanent assignments. You have a job, you're the logistics manager and every day you do logistics and you're going to do that forever because it's an ongoing task. Design shops tend to have a flow of work life that is around projects. There is actually very little ongoing work. There are projects. They may be a lot of projects for the same company but they are defined as projects and tend to have a defined term. It's a completely different feel of work life and I think it actually has

a great benefit of efficiency. Most traditional firms have people who are doing projects whether they know it or not and they staff up to the peak maximum required for the project. For those of you who are from Ontario, Ontario Hydro staffed up their engineering and construction unit because they were busily electrifying Ontario and then wondered, "Gee, now we're done with that, why do we have 10,000 surplus people that we have to fire?" Well, it's because it was a project; not an ongoing task. It should have been treated like a project. Same actually with McDonald's in-house design construction operation. I think it's actually more efficient but I think it's going to be the way of the world for our traditional firms going forward.

What's the source of status in the traditional firm? It's managing big budgets and large staffs. It's running ever bigger businesses with ever more zeros attached to both the number of people and the dollars of sales and profits. That is the pinnacle of status in traditional firms. What generated status by in design shops? From what I can see at least, it is having a history of solving to the toughest design problems; tackling tough mysteries we don't understand and coming up with elegant solutions. The style of work in traditional business is to have defined roles with somebody in charge. In traditional firm you hear lots of discussion about ownership. "I own that task, I own that business." So it's about having sole ownership and waiting until you've got it right to do anything, to deploy anything. The design shop, I think, has much more of a collaborative style with a recognition that it's about dialogue. Dialogue with the client, dialogue with others, and an approach that's "Let's try it, let's prototype it and improve it. " So, in action, learning a style.

In the traditional firm, the traditional way of thinking focuses on deductive and inductive reasoning. So deductive, proving that something must be. So all dogs have four legs, that has four legs, it must be dog. Inductive reasoning: showing that something is operative. I've seen twelve animals with four legs called dogs, so all dogs must have four legs. Obviously design shops have to do that too, but design shops also use a king of reasoning that is not, I think, used in the traditional firm and that is adductive reasoning. Not proving that something must be or showing that something is operative, but suggesting that something may be. Reaching out to something that may be, so I have a reason to believe something may be. I cannot prove that it is or will be, but it may be. Of course that is key to the creative process. Imagining things that are not now, but may be in the future. And that is the kind of reasoning is not typically found or rewarded in traditional firms. And I would argue whether we know it or not or whether or not we call it that, that's the kind of logic that exists in design firms. The dominant attitude in the traditional firm, "We can only do what we have budget to do, so what's our budget? We can do that amount of stuff." Because constraints are the enemy, people in traditional firms, spend a lot of time trying to get the constraints relaxed: "Do we really have to do that in six months, can't we have a year? Do we really have to stay under fifty million dollars, can't we have a hundred million dollars?" That's the dominant attitude in the traditional firm. Not in every firm perhaps, but I would say, the dominant attitude.

The dominant attitude in the design shop is nothing can't be done. Why? Because of adductive reasoning. Something may be, that doesn't exist now, so nothing can't be done for sure.

That's the only thing we can say we know for sure in a design shop - nothing can't be done. Constraints increase the challenge and the excitement. As I hang around design organizations more and more, this is one of the things, that is the most fascinating for me, that there is a joy in constraints. It's, "Oh, wow, we have to come up with something in a week? Gee, that makes it harder and more complicated. Therefore it's a more wicked problem. If I solve it and come up with something great that makes me happier, it gives me higher status." Now even in design shops there are some saying, "Can't we take two weeks?", but I see more of that "Oh wow" attitude by several orders of magnitude than in traditional firms. For this world that I think we are going into where it is challenging, taking on mysteries, developing heuristics, demonstrating the artistry associated with that will require a pretty substantial change in some of the fundamental ways we work and how traditional firms around the world work.

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Last implication: It is not about the business of design. There's more interest in design now than there has been, it's on a rising wave, but I think the interest is misplaced. The traditional world is trying to understand what designers do and how they do it and how to manage them. Business needs to understand the design process, needs to understand and manage these weird and wonderful people called designers. But fundamentally misses the point. That is not the issue. It's all well and good for them to understand the design process but that is not going to save the traditional firm. It is all about the design of business. We need to think about designing our business. Business people need to think about designing their businesses to provide elegant products and services in the most elegant manner. That's what business in the 21st century is going to be. So, I would argue, quite simply, they need to be designers. They need to be designers of businesses. They don't need to understand designers, they need to be designers. They need to think like designers, they need to work like designers, they need to have the attitudes of designers, they need to evaluate each other as designers do each other.

We must not underestimate the challenge associated with this. It is a revolution in thinking. It is a revolution in the thinking of the business world. And that's going to take a lot of work and change and some considerable upsetting of the status quo but I think we're on the cusp of that design revolution in business. I might say, by way of public service announcement, that at the Rotman school we are absolutely committed to being a critical part of that transformation. We plan to teach our students how to be designers of business. We're working with design firms and design educators to see how we can take concepts from the world of design and teach our students, while they're still malleable, to be designers of business. With that, I have not taken an hour, I've taken 35 minutes, and I'm happy to stop here, and take questions Thank you very much for listening.

Question Period

Q: Perhaps this is not a long term solution?

A: I think that's a good point and I think that the answer is certainly yes. Any solution that you have now is only the best solution of the day and it's the least flawed solution available. I believe every solution to every problem can be improved. What we often get into I think is a bit of a cul-de-sac. We have an algorithm (a heuristic that gets converted to an algorithm) and then we say this is the answer, the ultimate answer, and then we code it. But then it starts not working as perfectly as we might hope and I could argue that actually gives rise to a new mystery, right? And somebody asks, "How can we deal with the fact that what we thought worked perfectly, doesn't?" And that can give rise to a better answer and many people would say Windows is an example of that.

Q: Often, the algorithm is not a perfect solution, even though it looks like it is on paper.

A: Yes. I think that's right, I think often the algorithm itself is perfect for the narrow conception of what it does and then we realize later ("oops") there are these other externalities that happen that are a big problem. It's like the environmental movement. There was an algorithm for how you set up your paper plant that involved dumping a whole bunch of bad things in the river. But that was just fine because you optimized your pulp plant. However, people began to say, "The fish are all dying and you're wrecking the environment." Then the fundamental algorithm is questioned, people say, "Is the whole way we think about making paper fundamentally flawed?" That often takes awhile, so I'd agree entirely with your premise.

Q: Do you see some of this change where business incorporates design, taking place?

A: Yes, I see some of that change happening, but I think it's going to be slow because there will be resistance. Why will there be resistance? Because the people at the top of many businesses couldn't design if their life depended on it and it's a very very scary thought, but I see it happening. If I can talk about one firm I work with, Proctor and Gamble, The head of Proctor and Gamble, has made design a big priority. He has no training in it whatsoever, but he is naturally a designer, and he is designing that business for a very different future. So, I see some signs of it, and I think it will be one of these tipping point things where there are innovators starting it, it will take off, and business people will recognize that it's what they have to do.

Q: Do you predict it will be good or bad for designers?

A: I think it's to the good for designers and I think that you will be drawn more into business. Rather than advising business, providing services and products for business, you'll be seen as more central. That is one thing that I very much predict.

Q: What are you doing to integrate design and business?

A: We're just at the start of that. I'll tell you the sorts of things we are contemplating. We're exposing business students to more designers. I have a speaker's series on designers and I'm in the process of creating alliances with design schools, and design firms, to get them more involved in the teaching. We're doing new research into the stuff I'm working on about how you can think about designing business, because design of business is not a field taught in design school, not so far at least. Design schools have some of the same problems that business schools have they're siloed; graphic images, design of products, design of buildings, it's broken down into those siloes.

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Q: Are businesses going to go in the direction of producing more entrepreneurs and entrepreneurial folks?

A: You know, I think that's been a wave already. Entrepreneurship is one of the fastest growing areas in business schools and many business schools have programs on entrepreneurship. There's a really interesting fact about entrepreneurship education in business schools worldwide. Which is, there is no evidence of any sort that it has any utility. Other than that it's pretty cool. There isn't any. It's one of the biggest growing areas and there is no literature yet that demonstrates it has a positive impact. Why? I think it's because there isn't a theory of entrepreneurship and I think that's a part of the challenge. We have to develop a theory of the design of business because I think successful entrepreneurship is the successful design of business. When there's no theory, it feels good to have a successful entrepreneur come in and say this is how I was entrepreneurial and everybody says, " man, that's cool, that's fabulous" but the question is, does that help them at all? And it might, there just isn't any evidence yet that it does.

Q: I wonder if the word that's missing here is 'thinking.' I read an article recently in Globe about slow learning, as opposed to fast learning, fast-fooding, and some of the things in the article are things you've been talking about.

A: Well given what sounded like your predilection, you should read Jim March, a Stanford learning guy, who is in praise of slow learners. He thinks that slow learners are better, those who actually have to take the time to learn more slowly, and he considers fast learning a trap, a learning trap. And I couldn't agree more. The focus of our school is on integrative thinking, the notion that we have to teach people how to think in a fundamentally different way than they are now trained to think, and studying more how people think, and less about just what they do. The thinking and doing link is incredibly important. I wouldn't want to say you could get anywhere by just talking about abstract principles but from consulting for really big companies for eighteen years before I took this job my view of managerial failure, is that there tends to be far too much doing and not enough thinking. I'd walk into these companies to consult and say, "Why do you do this?" The answer more often than not was, "uhhhh, I dunno", or "because we always have." Not, "here's how we thought about it, and here's why," and so I tend to be very

Draconian on those. Well we're going to stop doing that until we think about it and about what might be the right thing to do. I think we have a doing bias that comes living in the world of algorithm and codes. What are algorithms and codes for? Having no thinking. They're a substitute for thinking. In fact, that is what code is: computer code is a substitute for thinking. Who does the thinking? The machine. On what basis do they think? On the basis of the coded instructions. Is that bad? No, it's really useful but let's remember, there is no thinking going on — the minute you turn that machine on, turn on that program. There is no thinking. And I think a shortage of thinking is a far bigger problem than a shortage of doing.

Q: Does this mean there will be an integration of design into business schools?

A: Yes. I do see them converging. I think, there probably ought to be convergence in both directions. I certainly see the need for more design principles being integrated, not side-by-side, not stuck together, but integrated into business schools and business education so that our output to businesses will be designers and design capable people. That's my world and I know little bit about that. I know a little bit less about your world. I'm not to sure what that will mean for design education. Will there be more business in design education as well? I suspect so.

Q: Do you think that design school curricula will change and there will be more business in those and a connection to the sort of stuff that you're doing at the Rotman School?

A: You know I haven't thought about that a whole lot. I have substantial challenge on my hands which is to figure out how to transform business education and use Rotman School as a lever in making that transformation happen or at least get started. But it makes sense to me. I think the convergence there makes a lot of sense and again, one of the interesting things will be, to see if it is it just side-by-side or really integrated? The gentleman at the back refused to JD/MBA's, the joint law and business degree. We run a JD/MBA jointly with the law school and it's a great program. I wouldn't disparage it for a moment but it isn't an integrative program. You take a law degree and a business degree and you get both degrees and we shrink it a little so that it's user friendly and efficient. But any notion that there is an integration of those two and that they are taught to integrate legal principles and business principles, is far fetched. There is no an attempt to do that. What do we hope? We hope that out of that program, we spew students who integrate it in their own mind and, you know what, I think a bunch do. You look at some of the great JD/MBA graduates in the Canadian community and you can tell they are interpenetrating these two fields and creating a model that's better. Can we take credit for it? Sadly, no. All we can take credit for is having a great business school and a great law school and leaving it to them. And that's one of the interesting. Businesses trying to understand how to manage design and have managers managing design managers is the side-by-side notion. "We're going to have to coexist with these weird people, so we better understand them." This is not exactly the all singing, all dancing solution, I think.

Q: Could you tell us about your work and research?

A: I wish I could. Actually, it's a work in progress. But I'm happy to share with you my thinking to date. My thinking to date is to do my own research and look at monumentally successful people across a number of fields from business to the arts, from non profit to profit, and ask the question, "Is there a pattern of thinking that these highly successful, unique people exhibit, that sets them apart from others who are less successful?" What I believe I will find, what I am already finding, is that those great thinkers think in a way that the people in this audience would say is how a designer is supposed to think. So, I'm first establishing the notion that you find the pattern of thinking that designers learn in the acts of these successful people, whether they happen to be in an artistic field like Atom Egoyan or Pierce Handling, or Moses Znaimer, or in straight business like Procter and Gamble or Michael Lichen, or Dick Curry. So first establish that there is a similar way of thinking codify it in a way that's useful for businesses, then start to teach that both conceptually and in practice. What I'm trying to figure out, which is not easy to figure out, is how design schools actually teach it. What I've found thus far is that they teach it mainly by doing, so that there's much less theory than doing. This may be the only way but I'm interested in figuring out what the theoretical groundings are because I don't want to be forcing anybody to do something if I can't explain why the doing would actually be good for him or her. I'm not going to take it on faith. So I'm in the process of exploring that and I'm having some fun and there's a place called The Illinois Institute of Design run by a guy called Patrick Whitney. I'm doing some work with him. I'm doing some work with the firm out in Stanford called IDO that many of you may know of. I'm just merrily exploring away as fast I can to try and come up with a better answer to your question.