The Design of BUSINESS

By Dean Roger Martin

We are on the cusp of a design revolution in business, says Dean ***Roger Martin****. Competing is no longer about creating dominance in scale-intensive industries, it's about producing elegant, refined products and services in imagination-intensive industries. As a result, he argues, business people don't just need to understand designers better – they need to* ***become*** *designers.*

These are turbulent times for business, as companies struggle to adjust to the globalization of markets and competition, the expansion of the service-based economy, the impact of deregulation and privatization, and the explosion of the knowledge revolution. All of these forces are driving firms to fundamentally rethink their business models and radically transform their capabilities – but an equally important (though less obvious) business transformation is taking place with respect to design.

As we leave behind one economic age and enter another, many of our philosophical assumptions about what constituted competitive success grew out of a different world. Value creation in the 20th century was largely defined by the conversion of *heuristics* to *algorithms*. It was about taking a fundamental understanding of a 'mystery' – a heuristic – and driving it to a formula, an algorithm – so that it could be driven to huge scale and scope. As a result, many 20th century organizations succeeded by instituting fairly linear improvements, such as re-engineering, supply chain management, enhanced customer responsiveness, and cost controls. These ideas were consistent with the traditional Taylorist view of the company as a centrally-driven entity that creates wealth by getting better and better at doing the same thing.

Competition is no longer in global scale-intensive industries; rather, it's in non-traditional, imagination-intensive industries. Today's businesses are sensing an increased demand for speed in product development, design cycles, inventory turns, and competitive response, and there are major implications for the individuals within those organizations. I would argue that in the 21st century, value creation will be defined more by the conversion of *mysteries* to *heuristics* – and that as a result, we are on the cusp of a design revolution in business.

The Progression from Mysteries to Binary Code

Over the course of time, phenomena enter our collective consciousness as *mysteries* – things that we observe, but don't really understand. For instance, the mystery of gravity once confounded our forefathers: when they looked around the world, they saw that many things, like rocks, seemed to fall to the ground almost immediately; but others didn't – like birds, and some seemed to take forever, like leaves. In art, there was the long battle to understand how to represent on a two-dimensional page what we saw in front of us in three dimensions. Music continues to be a mystery that confounds: what patterns of notes and sounds are enjoyable and make listeners feel happy and contented?

We start out with these *mysteries*, and at some point, we put enough thought into them to produce a first-level understanding of the question at hand. We develop *heuristics* – ways of understanding the general principles of heretofore mysteries. Heuristics are rules of thumb or sets of guidelines for solving a mystery by organized exploration of the possibilities.

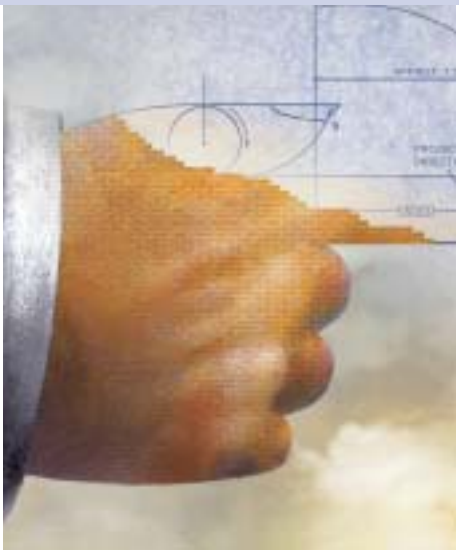
So why do things fall down? We develop a notion of a universal force called 'gravity' that tends to pull things down. In art, we develop a notion called 'perspective' that

ILLUSTRATION: MICHAEL GIBBS

guides our efforts to create renderings that appear to the eye to have three dimensions rather than two. What kind of music do people like to listen to? We learn about chords, and then create song types like ballads, or folk songs, or the blues. By following a set of guidelines, we will likely create something that people enjoy listening to.

Heuristics don't guarantee success – they simply increase the probability of getting to a successful outcome. They represent an incomplete understanding of a heretofore mystery.

Design skills and business skills are converging. To be successful in the future, business people will have to become more like designers — more 'masters of heuristics' than 'managers of algorithms'.



In any given field, some people barely understand heuristics, while others master them. The difference between them is the difference between one-hit-wonder **Don McLean**, author of "American Pie", and **Bruce Springsteen**, composer of scores of hit songs. For McLean, the mystery remained just that: he came up with a single inspiration that created one random event – one of the biggest pop song hits of all time. Yet he failed to produce another hit of any consequence in his entire musical career. In contrast, Springsteen developed a heuristic – a way of understanding the world and the people in it – that enables him to write songs that have great meaning to people and are immensely popular. His mastery of heuristics has allowed him to generate a steady stream of hit albums over a 30-year period.

In due course, increasing understanding can (though in many cases it never does) produce an *algorithm*: a logical, arithmetic or computational procedure that, if correctly applied, ensures the solution of the problem. With gravity, great scientists like **Sir Isaac Newton** studied and experimented long and hard enough to create precise rules for determining how fast an object will fall under any circumstance. In the late 1970s, musical innovators like British techno-music guru **Brian Eno** experimented with the human heartbeat and determined that songs with a synthesized heartbeat as their rhythm track are instinctively enjoyed by listeners, no matter what you add on top of them. The end result of such algorithms is not always positive, of course – this discovery led to electro-pop and eventually to sham bands like **Milli Vanilli**, who lip-synched recorded music onstage until caught in the act by an unsuspecting audience. And in art, we eventually got paint by numbers.

In the modern era, a fourth important step has been added to the sequence of *mystery* to *heuristic* to *algorithm*. Eventually, some algorithms now get coded into software. This means reducing the algorithm – the strict set of rules – into a series of 0's and 1's – *binary code* – that enables a computer to produce a result. For example, with gravity, the fact that we had an algorithm for 'how things fall' meant that we could program aircraft with autopilot, enabling a plane to 'fall' from the sky in the organized fashion that we want it to, so that it lands in exactly the right spot. At the coding level, there is no longer any judgment involved: the plane lands on the basis computer instructions that are nothing but a series of 1's and 0's, because our understanding of gravity has moved from a *mystery* to a *heuristic* to an *algorithm* to *binary code*.

Implications for the Design of Business

The progression of the 'march of understanding' described here has important practical implications for today's business people. Broadly speaking, value creation in the 20th century was about taking a fundamental understanding of a mystery – a heuristic – and reducing it to a formula, an algorithm – so that it could be driven to huge scale and scope.

Take **McDonalds**, for instance. In 1955, the McDonald brothers took a mystery – 'how and what do Californians want to eat'? And they created a format for answering that – a heuristic – which was the quick-service restaurant. Is this heuristic what created enormous value? No, because there were many restaurants in California doing similar things at the time, and all of them were discovering that Californians wanted faster, more convenient food. What made McDonalds different is that **Ray Kroc** came along and saw that he could drive the McDonald brothers' heuristic to an algorithm. He bought the store and figured out *exactly* how to cook a hamburger, *exactly* how to hire people, *exactly* how to set up and manage stores, and *exactly* how to franchise them. Under Kroc, nothing was left to chance in the McDonalds' kitchen: every hamburger came out of a stamping machine weighing exactly 1.6 ounces, its thickness measured to the thousandth of an inch, and the cooking process stopped automatically after 38 seconds, when the burgers reached an internal temperature of exactly 155 degrees. By creating an algorithm out of a heuristic, Kroc was able to drive McDonalds to huge size and scope, and to its place today as a global icon.

This move from heuristic to algorithm was repeated over and over throughout the 20th century. Early in the century, **Ford** developed the algorithm for assembling cars – the assembly line – and with it grew to immense size. Late in the 20th century, **Electronic Data Services** (EDS) developed algorithms for routinizing systems integration and training COBOL programmers, and with it grew to previously unimagined size in the systems integration business. In between, **Procter & Gamble** created the algorithm for brand man-

agement, **Anheuser-Busch** for making and selling beer, **Frito Lay** for making and distributing snack chips, on so on. For these companies, as well as **Dell** and **Wal-Mart**, success depended not so much on a superior product, but on a superior process, and each is an example of the relentless 'algorithm-ization' that paved the way for massive value creation in the 20th century.

This dynamic accelerated in the latter part of the 20th century (1985-2000), when many algorithms were driven to code. Like most things in life, this final step of reducing something to binary code has good and not-so-good aspects to it. While coding enables an incredible increase in efficiency, it is also true that with coding comes the end of judgment: patterns of 0's and 1's have no judgment or artistry – they just automatically apply an algorithm. In many respects, the extreme achievement of the 20th century is soulless numbers. Neither all bad or all good, this is simply the result of the combination of the relentless march of understanding with the relentless march of Moore's Law (**Intel** co-founder **Gordon Moore**'s prediction that data density would double approximately every 18 months, resulting in diminishing costs of information technology) – all of which lead to binary code.

So where do we go from here? Will there be more relentless algorithm-ization? I don't think so. I believe that we will look back on the 20th century as a *tour de force* of producing 'stuff' – lots of it, as efficiently as possible. I believe we are transitioning into a 21st century world in which value creation is moving back to the world of taking *mysteries* and turning them into *heuristics*. I see the beginnings of a fundamental backlash against algorithm-ization and the codification of the world around us – a realization that reaching to grab the benefits of economies of scale often involves accepting standardization and soullessness in exchange.

I believe the 21st century will go down in history as the century of producing elegant, refined products and services – products and services that delight users with the gracefulness of their utility and output; 'goods' that are produced elegantly – for example, that have the most minimal environmental footprint possible, or that produce the fewest worker injuries, whether it be broken limbs or repetitive stress syndrome.

The 21st century presents us with an opportunity to delve into mysteries and come up with new heuristics. As a society we are faced with major mysteries like, 'how can big cities actually work'? There are more of them than ever before, and while cities like Toronto and New York work pretty well, many cities around the world don't, and fixing this is a major mystery. Another big mystery involves how to make health care work, when there's an infinite demand and a constrained supply. These are the kind of modern mysteries that are being presented to us, and there is no algorithm for them, no coding to magically solve the problems they engender.

Implications for Businesspeople

There are three major implications of this shift for today's business people. The first is that design skills and business skills are converging. The skill of design, at its core, is the ability to reach into the mystery of some seemingly intractable problem – whether it's a problem of product design, architectural design, or systems design – and apply the creativity, innovation and mastery necessary to convert the mystery to a heuristic – a way of knowing and understanding.

But unlike in the 20th century, this time the goal won't be to develop mass formulas or algorithms. Firms today are desperately trying to find out what each individual customer wants. **Kellogg's** cereals and **Hershey's** chocolate bars have 1-800 phone numbers printed on them encouraging consumers to call them with feedback. **Pepsi** has its Web site printed on each can. Information is being gathered and used to cater to and customize solutions to your every need.

I would argue that to be successful in the future, businesspeople will have to become more like designers – more 'masters of heuristics' than 'managers of algorithms'. For much of the 20th century, they moved ahead by demonstrating the latter capability. This shift creates a huge challenge, as it will require entirely new kinds of education and training, since until now, design skills have not been explicitly valued in business. The truth is, highly-skilled designers are currently heading-up many of the world's top organizations – they just don't know they are designers, because they were never trained as such.

The second implication is that we need a new kind of business enterprise. This new world into which we are delving will require us to tackle mysteries and develop heuristics – and that will require a substantial change in some of the fundamental ways we work. Traditional firms will have to start looking much more like design shops on a number of important dimensions, as shown in Table 1, below.

Table 1: Modern Firms Must Become More Like Design Shops

FEATURE	FROM "TRADITIONAL FIRM..."	...TO "DESIGN SHOP"
Flow of Work Life	Ongoing tasks Permanent assignments	Projects Defined Terms
Source of Status	Managing big budgets and large staffs	Solving 'wicked problems'
Style of Work	Defined roles Wait until it is 'right'	Collaborative Iterative
Mode of Thinking	Deductive Inductive	Deductive Inductive Abductive
Dominant Attitude	We can only do what we have budget to do Constraints are the enemy	Nothing can't be done Constraints increase the challenge and excitement

Designing for Success at P&G

***Claudia Kotchka**, vice president of design innovation and strategy at **Procter & Gamble**, recently spoke to Karen Christensen about the key role design plays in her organization, and what business people everywhere can learn from designers.*

How can an organization achieve 'design success'?

I would start by defining 'design success' as the integration of design thinking into an organization's product offerings. This includes elements such as style, ergonomics, sensory factors, etc. Organizing for design success entails two key things: Getting the right skill sets on your team, and having a multifunctional team from the start. One way lots of groups innovate is the 'hand it over the wall' process. For example, R&D will invent a new technology, send it over to Marketing, they'll write a concept, then it comes 'over the wall' to Design for the packaging and minor product alterations, and you end up with less than optimal results. To get the best results, all three groups should be working together, up front. This allows you to do things holistically, rather than in a linear fashion. When Marketing, R&D and Design innovate together, you get better ideas with a greater chance for success in the marketplace. It might sound logical, but it doesn't happen often enough. A great book on this process is called *Creating Breakthrough Products*, by **Jonathan Cagen** and **Craig Vogel**, two Carnegie Mellon professors.

Each of P&G's businesses has its own design strategist. What is their role?

P&G's Claudia Kotchka

We call them Brand Identity Directors, and they make sure that our equity assets are robust. Their job is to ask, 'what are all of the equities of, say, Tide?' The easy part is the logo, packaging and colors – but what about a smell, or a sound, or other unique things that can show up at retail or in use? We try to look at brand equity very holistically and make sure we have robust assets, that really help the brand connect with the consumer and engage various senses. The brand ID director's job is to make sure that we have relevant and engaging assets, and that they are expressed consistently in the marketplace. That doesn't mean that every market has to look the same globally – but within a market, you definitely want what the consumer experiences from the brand to be consistent. This is a critical role, because consumers never see all the strategy stuff we work on – all they see is the execution, so if we execute poorly, that's our strategy, as far as they're concerned.

Whereas traditional firms organize around ongoing tasks and permanent assignments, in design shops, work flows around projects with defined terms. The source of status in traditional firms is 'managing big budgets and large staffs', but in design shops, it derives from building a track record of finding solutions to 'wicked problems' – solving tough mysteries with elegant solutions. Whereas the style of work in traditional firms involves defined roles and seeking the perfect answer, design firms feature extensive collaboration, 'charettes' (focused brainstorming sessions), and constant dialogue with clients.

When it comes to innovation, business has much to learn from design. The philosophy in design shops is, 'try it, prototype it, and improve it'. Designers learn by doing. The style of thinking in traditional firms is largely inductive – proving that something actually operates – and deductive – proving that something must be. Design shops add *abductive* reasoning to the fray – which involves *suggesting* that something *may be*, and reaching out to explore it. Designers may not be able to prove that something *is* or *must be*, but they nevertheless reason that it *may be*, and this style of thinking is critical to the creative process. Whereas the dominant attitude in traditional firms is to see constraints as the enemy and budgets as the drivers of decisions, in design firms, the mindset is "nothing can't be done for sure," and constraints only increase the excitement level.

The third implication is that we must change the focus of our thinking about design and business. The trends discussed here have generated increased interest in design by the business world, but it is largely focused on 'the business of design': the traditional business world is trying to figure out what designers do, how they do it, and how best to manage them. This misses the point fundamentally, and it won't save the traditional firm. The focus should actually be placed on 'the design of business': We need to think much more about designing our businesses to provide elegant products and services in the most graceful manner possible.

Business people don't need to understand designers better: *they need to be designers.* They need to think and work like designers, have attitudes like designers, and learn to evaluate each other as designers do. Most companies' top managers will tell you that they have spent the bulk of their time over the last decade on improvement. Now it's no longer enough to get better; you have to 'get different'.

I believe that we are on the cusp of a design revolution in business – a revolution in the purpose of business, the work of business, and the skills required of business people. The challenge of making the transformation to the Design of Business should not be underestimated. The initial goal is to help modern managers understand this new business agenda and become shapers of contexts, to increase the likelihood that their organizations will thrive in the era of design. RM

Do you agree that business people today have to become 'designers'?

It's a brand new way of thinking, but I definitely agree with it. It's really about looking at what designers do and how they work in a much broader way, and seeing them as more than designers of products or aesthetic stylists. **Tim Brown**, president of **IDEO**, describes design as "a tool to solve unpredictable problems." Business leaders are faced with solving unpredictable problems every day – so to have the design skill set in your repertoire is immensely valuable.

How do designers think?

There are three keys to it. First, designers are very empathetic. Design is always for somebody else, so if you're designing a product, you start out by getting inside the head of the user, and determining what they would want or need. The user doesn't usually tell you what they want, because they can't easily describe what they can't see or imagine. So designers have to be able to figure this out by watching, listening and relating to the user. From a business perspective, if you're trying to structure an organization, for example, it's critical to have empathy for who is going to be working in the organization and not just focus on what the organization is trying to do.

Designers always ask, 'are we solving the right problem?' If you hand designers a problem, they never just take it and solve it. They always question it, and that comes from empathy – from really understanding the user and being accustomed to questioning models. It's not uncommon for them to come back having reframed the problem, often within a richer and broader context.

Second, Designers problem-solve holistically, not in a linear fashion. While the scientific method for problem solving uses problem focused strategies and analysis, designers use solution focused strategies and synthesis. They start with a whole solution rather than break it down into parts.

That brings me to the next key, which is prototyping. Designers start with a variety of possible solutions, prototype them, get feedback, revisit the problem, and evolve solutions. The process is a continuous loop until they find a solution that works. Often, when business people work on a problem, they spend a long time studying it, trying to identify the best solution, and then rolling it out, rather than using this iterative process of building, testing, and evolving.

Do you consider yourself a designer?

Sure. What I'm designing is a capability for P&G to incorporate design into all different phases of the work we do. Working closely with designers has taught me that they truly make different connections and process things differently. I have learned more from them than I can tell you, and I continue to learn from them every day.