

DESIGN, RISK, AND UNCERTAINTY

1. Tim Brown, CEO of IDEO, "Design Thinking", *Harvard Business Review*, June, 2008

This article raises several issues in the evolution of design from the creation of commodity artefacts to large-scale strategic interventions. He emphasizes the role of brainstorming and prototyping as initial phases of a design process that increasingly takes on the properties of how to deal with wicked problems.

"Historically, design has been treated as a downstream step in the development process--the point where designers, who have played no earlier role in the substantive work of innovation, come along and put a beautiful wrapper around the idea...Now, however, rather than asking designers to make an already developed idea more attractive to consumers, companies are making asking them to create ideas that better meet consumers' needs and desires. The former role is tactical, and results in limited value creation; the later is strategic, and leads to dramatic new forms of value."

"Moreover, as economies in the developed world shift from industrial manufacturing to knowledge work and service delivery, innovation's terrain is expanding. Its objectives are no longer just physical products; they are new sorts of processes, services, IT-powered interactions, entertainments, and ways of communicating and collaborating--exactly the kinds of human-centered activities in which design thinking can make a decisive difference."

"Many of the world's most successful brands create breakthrough ideas that are inspired by a deep understanding of consumers' lives and use principles of design to innovate and build value. Sometimes innovation has to account for vast differences in cultural and socioeconomic conditions. In such cases, design thinking can suggest alternatives to the assumptions made in developed societies."

2. Robert Buchanan. "Wicked Problems in Design Thinking"

The notion of a wicked problem developed out of operations research as a critique of the existing models of planning in science and engineering. The term comes from Karl Popper. Design as a wicked problem emerges as design becomes thought of as innovation within a strategic context.

"To understand what this means, it is important to recognize that indeterminacy is quite different from undetermined. Indeterminacy implies that there are no definitive conditions or limits to design problems. This is evident, for example, in the ten properties of wicked problems that Rittel initially identified in 1972. (1) Wicked problems have no definitive formulation, but every formulation of a wicked problem corresponds to the formulation of a solution. (2) Wicked problems have no stopping rules. (3) Solutions to wicked problems cannot be true or false, only good or bad. (4) In solving wicked problems there is no exhaustive list of admissible operations. (5) For every wicked problem there is always more than one possible explanation, with explanations depending on the Weltanschauung of the designer. (6) Every wicked problem is a symptom of another, "higher level," problem. (7) No formulation and solution of a wicked problem has a definitive test. (8) Solving a wicked problem is a "one shot" operation, with no

room for trial and error. (9) Every wicked problem is unique. (10) The wicked problem solver has no right to be wrong—they are fully responsible for their actions. This is a remarkable list, and it is tempting to go no further than elaborate the meaning of each property, providing concrete examples drawn from every area of design thinking. But to do so would leave a fundamental question unanswered. Why are design problems indeterminate and, therefore, wicked? Neither Rittel nor any of those studying wicked problems has attempted to answer this question, so the wicked-problems approach has remained only a description of the social reality of designing rather than the beginnings of a well-grounded theory of design. However, the answer to the question lies in something rarely considered: the peculiar nature of the subject matter of design. Design problems are "indeterminate" and "wicked" because design has no special subject matter of its own apart from what a designer conceives it to be. The subject matter of design is potentially universal in scope, because design thinking may be applied to any area of human experience. But in the process of application, the designer must discover or invent a particular subject out of the problems and issues of specific circumstances. This sharply contrasts with the disciplines of science, which are concerned with understanding the principles, laws, rules, or structures that are necessarily embodied in existing subject matters. Such subject matters are undetermined or under-determined, requiring further investigation to make them more fully determinate. But they are not radically indeterminate in a way directly comparable to that of design."

3. George Soros. Soros was heavily influenced by Karl Popper from whom he derives both his notion of "reflexivity" and the name of his foundation, "Open Society". For him, finance is a "wicked problem". Italicized sections are about his notion of reflexivity, taken from a talk he gave at M.I.T.

The Theory of Reflexivity by George Soros

Delivered April 26, 1994 to the MIT Department of Economics World Economy Laboratory Conference Washington, D.C.

When Rudi Dornbusch invited me to speak at this conference, he gave me a totally free hand in deciding what I wanted to talk about. Well, I want to discuss a subject which fascinates me but doesn't seem to interest others very much. That is my theory of reflexivity which has guided me both in making money and in giving money away, but has received very little serious consideration from anybody else. It is really a very curious situation. I am taken very seriously; indeed, a bit too seriously. But the theory that I take seriously and, in fact, rely on in my decision-making process is pretty completely ignored. I have written a book about it which was first published in 1987 under the title *The Alchemy of Finance*; but it received practically no critical examination. It has been out of print for the last several years but demand has been building up as a result of my increased visibility, not to say notoriety, and now the book is being re-issued. I think this is a good time to get the theory seriously considered.

I was invited to testify before Congress last week and this is how I started my testimony. I quote: "I must state at the outset that I am in fundamental disagreement with the prevailing wisdom. *The generally accepted theory is that financial markets tend towards*

equilibrium, and on the whole, discount the future correctly. I operate using a different theory, according to which financial markets cannot possibly discount the future correctly because they do not merely discount the future; they help to shape it. In certain circumstances, financial markets can affect the so-called fundamentals which they are supposed to reflect. When that happens, markets enter into a state of dynamic disequilibrium and behave quite differently from what would be considered normal by the theory of efficient markets. Such boom/bust sequences do not arise very often, but when they do, they can be very disruptive, exactly because they affect the fundamentals of the economy.” I did not have time to expound my theory before Congress, so I am taking advantage of my captive audience to do so now. My apologies for inflicting a very theoretical discussion on you. . .

Classical economics was modeled on Newtonian physics. It sought to establish the equilibrium position and it used differential equations to do so. To make this intellectual feat possible, economic theory assumed perfect knowledge on the part of the participants. Perfect knowledge meant that the participants' thinking corresponded to the facts and therefore it could be ignored. Unfortunately, reality never quite conformed to the theory. Up to a point, the discrepancies could be dismissed by saying that the equilibrium situation represented the final outcome and the divergence from equilibrium represented temporary noise. But, eventually, the assumption of perfect knowledge became untenable and it was replaced by a methodological device which was invented by my professor at the London School of Economics, Lionel Robbins, who asserted that the task of economics is to study the relationship between supply and demand; therefore it must take supply and demand as given. This methodological device has managed to protect equilibrium theory from the onslaught of reality down to the present day.

I don't know too much about the prevailing theory about financial markets but, from what little I know, it continues to maintain the approach established by classical economics. This means that financial markets are envisaged as playing an essentially passive role; they discount the future and they do so with remarkable accuracy. There is some kind of magic involved and that is, of course, the magic of the marketplace where all the participants, taken together, are endowed with an intelligence far superior to that which could be attained by any particular individual. I think this interpretation of the way financial markets operate is severely distorted. That is why I have not bothered to familiarize myself with efficient market theory and modern portfolio theory, and that is why I take such a jaundiced view of derivative instruments which are based on what I consider a fundamentally flawed principle. Another reason is that I am rather poor in mathematics.

It may seem strange that a patently false theory should gain such widespread acceptance, except for one consideration; that is, that all our theories about social events are distorted in some way or another. And that is the starting point of my theory, the theory of reflexivity, which holds that our thinking is inherently biased. Thinking participants cannot act on the basis of knowledge. Knowledge presupposes facts which occur independently of the statements which refer to them; but being a participant implies that one's decisions influence the outcome. Therefore, the situation participants have to deal

with does not consist of facts independently given but facts which will be shaped by the decision of the participants. There is an active relationship between thinking and reality, as well as the passive one which is the only one recognized by natural science and, by way of a false analogy, also by economic theory.

I call the passive relationship the “cognitive function” and the active relationship the “participating function,” and the interaction between the two functions I call “reflexivity.” *Reflexivity is, in effect, a two-way feedback mechanism in which reality helps shape the participants’ thinking and the participants’ thinking helps shape reality in an unending process in which thinking and reality may come to approach each other but can never become identical. Knowledge implies a correspondence between statements and facts, thoughts and reality, which is not possible in this situation. The key element is the lack of correspondence, the inherent divergence, between the participants’ views and the actual state of affairs. It is this divergence, which I have called the “participant’s bias,” which provides the clue to understanding the course of events. That, in very general terms, is the gist of my theory of reflexivity.*

The theory has far-reaching implications. It draws a sharp distinction between natural science and social science, and it introduces an element of indeterminacy into social events which is missing in the events studied by natural science. It interprets social events as a never-ending historical process and not as an equilibrium situation. The process cannot be explained and predicted with the help of universally valid laws, in the manner of natural science, because of the element of indeterminacy introduced by the participants’ bias. The implications are so far-reaching that I can’t even begin to enumerate them. They range from the inherent instability of financial markets to the concept of an open society which is based on the recognition that nobody has access to the ultimate truth. The theory gives rise to a new morality as well as a new epistemology. As you probably know, I am the founder—and the funder—of the Open Society Foundation. That is why I feel justified in claiming that the theory of reflexivity has guided me both in making and in spending money....

4. Gillian Tett, author of *Fools’ Gold*, an account of the invention of the credit derivatives, particularly the credit default swap. She is assistant financial editor of the *Financial Times* and has a Phd. in social anthropology from Cambridge University. She did her field work in Tajikistan. *Fools’ Gold* tells the story of the invention of the credit default swap as a creative financial innovation, which was thought to have a socially useful function in that it would free up bank balance sheets so that banks could make more loans to deserving people, such as mortgages for the poor; credit default swaps were basically insurance against default and as such would relieve the need for banks to have reserves to cover losses. Tett’s book can be read as a thick description of the design of a financial innovation, its circulation, dissemination, and ultimate backfiring as credit derivatives play a major role in the ongoing global financial crisis.

Some interview quotes on anthropology and finance:

"But the other thing is, if you come from an anthropology background, you also try and

put finance in a cultural context. Bankers like to imagine that money and the profit motive is as universal as gravity. They think it's basically a given and they think it's completely apersonal. And it's not. What they do in finance is all about culture and interaction."

www.guardian.co.uk/.../creditrunch-gillian-tett-financial-times

"(W)hat is crystal clear is that if you want to understand which banks will emerge as winners from the current mess, it is no longer enough to look at their computer systems and balance sheets. Now, more than ever, investors need to understand a bank's culture too - and the degree to which it is tribal. As I said, a training in Tajik anthropology is suddenly looking very useful."

http://www.antropologi.info/blog/anthropology/2008/anthropologist_investors_need_to_understand

From *Fools' Gold*

"The J.P. Morgan derivatives team was engaged in the banking equivalent of space travel. Computer power and high-order mathematics were taking finance far from its traditional bounds, and this small group of brilliant minds was charter the outer reaches of cyber-finance. Like scientists cracking the DNA code or splitting the atom, the J.P. Morgan swaps team believed their experiments in what bankers refer to as "innovation"—meaning the invention of bold new ways of generating returns—were solving the most foundational riddles of their discipline. "There was this sense we had found this fantastic technology which we really believed in and we wanted to take to every part of he market we could... There was a sense of mission."

5. Frank Knight, *Risk, Uncertainty, and Profit*

"Uncertainty must be taken in a sense radically distinct from the familiar notion of Risk, from which it has never been properly separated.... The essential fact is that 'risk' means in some cases a quantity susceptible of measurement, while at other times it is something distinctly not of this character; and there are far-reaching and crucial differences in the bearings of the phenomena depending on which of the two is really present and operating.... It will appear that a measurable uncertainty, or 'risk' proper, as we shall use the term, is so far different from an unmeasurable one that it is not in effect an uncertainty at all."