

## Foreword

It's the start of the twenty-first century and the innovation buzz is deafening. It commands the attention of everything—from mainstream media and popular culture to scientific journals. Innovation is now the driver of economies and the key to retaining a competitive edge. In its simplest form, innovation seems to have become an all-encompassing term for anything new which creates value or is simply cool and popular.

Given its importance, it's clear why people want to write about innovation. But what more could really be said?

Well, actually a lot. Of the many books focusing on the topic, from failing fast to managing innovation in firms, there always seem to be two parts missing:

- What are the best innovation tools to reduce risk?
- How one can I best exploit such tools?

In my book, *Innovation Tools – The most successful techniques to innovate cheaply and effectively*, I answer these questions. There are six comprehensive chapters covering a wide range of techniques and in this sample I present an abridged version of one of them. Get your copy at <https://amzn.com/B01F3NDLP4>.

### Choosing A Winner The 21st Century Way

Richard and Mike sit opposite each other in a small room on a university campus. They have just spent the last 15 minutes listening to a rather unkempt man in casual dress explain the rules of a game they will voluntarily play together. It is an unusual game but it seems lucrative: a simple auction where either of them might walk away with ten dollars for nothing!

The game begins. Richard starts and puts in a bid of one cent for the ten dollars. A great deal, pay one cent, get ten dollars. But he's doubtful that he'll walk away with the ten dollars because Mike will surely bid higher. As expected, Mike throws in a bid of two cents.

Richard knows he can't leave it there. According to the rules of the game, both players have to pay their final bid no matter who wins. So if our newly minted gambler stops now, he'll get nothing, but will have to pay one cent. Not bad, but not as good as walking out with a profit of \$9.97 if he simply wagers three cents. So he does just that.

However, Mike doesn't hesitate and shoots back with four cents. Annoyed, Richard bets five cents and before he has finished computing his win, Mike has already bet six. Richard ups the ante—fifty cents. That will show Mike that he's serious and hopefully he'll leave the game licking his wounds with a minor loss of six cents.

One dollar. That wasn't part of Richard's plan but now the betting pendulum is oscillating quickly. One dollar-fifty. Two dollars. Three dollars. Five! Richard is sweating. No matter what happens now he needs that ten dollars. A five dollar loss is a day's lunch at the cafeteria, but Mike is aware of that too.

Nine dollars. Richard gasps. If he gives up now he loses five dollars but if he can clinch the win, at least he walks out with something. So he bets nine dollars-fifty, confident that Mike will give up. Before he can relax, Mike bets nine dollars-ninety! Richard scratches his head. There's only a ten cents win left in the game, but if he loses he's out of pocket for two day's lunch. Nine dollars ninety-five. At least he can take home five cents profit.

Then comes the crunch. Mike bets ten dollars. From now on, both know they are losing money. They look nervously at the auctioneer who just grins back. They shoot a glance at each other, knowing who the real winner is. Richard doesn't want to be the biggest loser and decides to cut his losses. Ten dollars and five cents. Surely Mike will give up now.

Eleven dollars. Twelve. Thirteen. Fifteen. Stop! At this point the supervisor stops the auction before it gets out of control. Richard's face is red and he can feel his pulse beating in his neck. His hands are sweaty and he's breathing heavily. This was supposed to be a game. A simple game. An easy ten dollars...

The story above is an example of a famous experiment called the "dollar auction." It is a classic game from game theory, first published by Martin Shubik in 1971. It has been played all over the world with the above results coming up repeatedly. As they progress in the game, the players' behavior invariably becomes more and more irrational, at least according to traditional game theory. Players keep increasing their losses by betting higher and higher.

It may seem like a bit of fun, but sometimes the fun can get out of control. During one executive MBA course, a \$20 auction like the one above was held. What were the final winning and losing bids? \$100? \$200? Try \$2,000 and \$1,950! The "loser" ended up faring better than the "winner."

According to behavioral economists, what we see here is completely normal. Well, completely expected. Behavioral economists like to focus on how people's decision making deviates from what they would expect from "perfect" decision makers. According to classical economics, a "perfect" decision maker is one who rationally weighs up all the options, decides which gives the optimal outcome, and acts upon it. In considering deviations from "perfect" decision making, one normally looks at those specific behaviors which lead people to deviate from how they "should" behave.

In the dollar auction, players become involved in the so-called escalation of commitments, which is driven (at least in part) by the so-called sunk cost bias. This common bias encourages participants to dig themselves an even deeper hole to get out of than the one they are already in. However, before we delve further into the bias, let's have a look at this pioneering area of economics that tries to explain how human beings really behave.

### **Behavioral Economics**

The field of behavioral economics looks at the real decisions human beings make, in particular the economic ones. Unlike classical economics, which creates models of what the ideal economic agent would do, the focus of behavioral economics is on how less-than-ideal economic agents (i.e. normal people) make decisions in real life. Specifically, how we deviate from a normative model of perfectly rational people. It basically includes all the dirty, non-rational bits, such as emotional, social and other factors, which play an important role in

our decision-making. It is these aspects that muddle and spoil the clean mathematical analysis desired by classical economists.

The model of a perfectly rational person has the individual making decisions by sitting down, finding all possible courses of action, comparing the benefits of the different choices and then choosing the one that maximizes either pleasure, wealth or whatever else the person desires most.

The biggest issue with this model for the behavioral economist is not whether the information required for perfect analysis can be acquired, or even whether the eventual choice is right, but the core assumptions about the decision making process. The main problem they have is the hypothesis that people are perfectly rational and able to optimally compute the best possible outcomes for themselves. Behavioral economists on the other hands ask themselves, do people really carefully analyze all options in detail, or do they use potentially suboptimal shortcuts or other tricks to cut through the whole process in making a decision? And they answer this question with a resounding, “Yes, they do!”

Finding and documenting these deviations from rationality has been a major challenge for economists of the twentieth and twenty-first centuries. Each bias demonstrates a type of behavior that strays from the economic optimal, and usually arises from a shortcut or trick to simplify decision-making. Ever since this new field of economics was started, inserting a long tally of biases after a researcher’s name has been a hobby of many academics.

In 1979, while this area was still quite new, a landmark paper was published by Daniel Kahneman and Amos Tversky that laid out a theoretical framework on why decisions deviate from perfect rationality. It wasn’t the first paper in the field, but it was definitely one of the most important. In it, the authors established the groundwork for a new model of understanding decision-making, as well as naming and demonstrating some of the first acknowledged biases in behavioral economics. This got the game of bias hunting rolling.

Essentially, the two psychologists outlined a number of common cognitive behavioral biases, which they then used to build a more accurate description of how people make decisions when risk is involved. The two main biases they examined were the certainty effect and the isolation effect. These predispositions were part of an argument that showed traditional utility theory (a theory about how people compare and assess the utility of their actions) was significantly flawed in describing people’s actual behavior. One of their more famous results was demonstrating that people are more risk adverse when deciding how to achieve gains than when trying to avoid losses of the same value.

As behavioral economics continues to achieve significant successes in both the academic and real world, more and more attention is naturally being focused on it. Behavioral study techniques and ideas are spreading to other fields, where these evidence-based insights into human behavior are revolutionizing more than just economics. The one area where this is not just important for scholars, or particular groups, but society as a whole, is innovation.

Decision makers with innovation on their agenda need to comprehend something about those aspects of human perception and of our cognitive processes that can lead us astray. They need to understand something about the psychology of choice and its effects on innovation. And it is here that two exciting fields of research have collided and out of them has arisen behavioral innovation.

## **Behavioral Innovation**

In this context, I use the term behavioral innovation to mean the study of the way we make decisions about innovation. It relies heavily on the concepts and biases developed by behavioral economics but is now wrapped in an innovation mantle. The new science looks at the way we assess our innovation investments and make choices, whether that be an investment of effort, time or money, in our own or other people's ideas. In this chapter, we will look at ways we can improve the decisions we make about the innovations we invest in.

It's important not to confuse this new branch of science with other similar fields. Areas such as cognitive innovation, creativity analysis and the like investigate the actual creativity process itself. The focus here is not on how we create ideas, since I will assume that you have a smorgasbord of ideas to choose from already (if you don't there are many books which can help you with this). What this chapter will help with though, is understanding the biases standing in the way of successful innovation by better recognizing good ideas and how to prudently invest your time and money in them.

For example, one could be considering a portfolio of startup investment options and deciding when to invest in an idea, either as a first time or repeat investor: whether from the perspective of a venture capitalist, an angel investor, or simply your own money or time. Here, you will learn about the general behavioral principles that can unconsciously and adversely, or positively, affect our innovation decision making.

If you have ever invested in someone else's idea, then you will know that making completely detached and shrewd decisions are difficult. It is exactly this challenge the current chapter wishes to address. If you don't think you've ever had this problem, then it is even more important that you read on as you have just clearly demonstrated a potentially detrimental bias!

The first class of biases we will consider is so well-known that it requires no introduction and can be pithily termed "the self-delusion biases." However, there are many other well-known and established biases I want to round up under this term. Basically they are all about our instinctual need to create a much better picture of ourselves than the facts warrant. In short, overestimating our abilities and being unduly overconfident.

### **That Sinking Feeling**

During the 1980s, IBM was the poster child of the American corporate world. It had just launched the PC, which was revolutionizing the home computer experience. The computing giant had also closed a fantastic looking deal with a little known startup called Microsoft, to provide it with an operating system. Together they created a PC with the MS-DOS operating system, which became an icon for the era.

MS-DOS was a command line based interface, which meant no pretty windows or mouse controls. Users had to type what they wanted the computer to do, in plain text on a black screen. Despite their commercial partnership being the envy of other computer producers such as Apple, IBM saw more long term potential in developing their own operating system. They thought they would take off and leave the scraps to the rabble at Microsoft.

Although financially successful, the hardware-software pair weren't winning their customers based on functionality and ease of use. This accolade soon went to Apple with its fancy graphical interface controlled by a mouse. The Microsoft/IBM duo, however, conquered the market on price. IBM had created a highly modular computer architecture for which Microsoft could build a cheap operating system.

Despite its commercial success, by the mid to late 80s, both parties in the partnership saw the need for a new visual interface. In the ensuing years, Microsoft had been busy quietly developing another operating system. At the same time, IBM had Microsoft help them with an operating system by enlisting their expertise to build and release the OS/2 operating system in 1987.

The OS/2 software was a significant improvement over earlier IBM operating system versions, however, it lacked what people wanted most: a Windows-style graphical user interface. Unfortunately for IBM, at the end of 1987 Microsoft released Windows 2.0—with much better graphics. This became the turning point for IBM because it marked the beginning of a decline into what would become a financial decision-making fiasco for the PC maker.

As people started moving to Windows *en masse*, IBM scrambled to get out an operating system with a Windows (or more accurately, Apple) style appearance. A year later in October 1988, IBM fulfilled expectations and released OS/2 version 1.1. Everything was looking promising for IBM, until it was discovered you couldn't print with it. Instead of saving themselves, they put another, of what would be many, expensive nails in the OS/2 coffin.

In a quick succession of releases, Windows continued to produce new operating systems, which were simply eating up IBM's market share. At the same time, startups such as Dell and Compaq began beating IBM on its own hardware turf. The real innovation in IBM's PC had been the open modular design. Computer chip makers such as Intel had capitalized on this and built a range of processors that could be easily used to put together a computer. This in turn opened up the market to other low cost competitors for IBM, such as Dell and Compaq.

Determined to stay in the game however, IBM marched bravely on and launched more and more versions of OS/2. In 1992, in spite of clear warning signs of impending disaster, IBM launched OS/2 version 2.0. Coincidentally, just as the company started to hemorrhage cash, it was well into a partnership with Apple to develop yet another operating system called Taligent. In retrospect, this was a strange decision, but for IBM it was to be the operating system to end all operating systems. Unfortunately for IBM, it didn't end that way.

In 1992, IBM choked and coughed up a nearly \$5 billion loss. But their ailment had just begun. In 1993, they topped their 1992 loss with another \$8 billion withering away. Big Blue's CEO John Akers was swiftly given the axe as they belatedly realized that continuing to spend so much money to keep a dead business model alive was only killing the company faster.

What happened to this pillar of the American corporate world? IBM management had fallen for one of the greatest bias traps around; the sunk costs fallacy. As they committed themselves further to one bad operating system after another, they blinded themselves to the objective reality that their product was just not working. They didn't want to pull the plug on the losing product they had already invested so much in. Instead, they let more money sink

down the drain as a result of their bad decisions and spent far too long pursuing what they refused to see as a lost cause.

The sunk cost fallacy is driven by previous investments, whether they were good or bad. It causes us to justify future investments on the basis of our past ones. This can be bad news if it leads us to deepen our cash contributions to a startup or idea only because of earlier commitments and not because of merit. This can be especially dangerous if we are reinvesting to prop up our struggling fledgling. You don't want to be the only one sitting in a deck chair on a sinking Titanic trying to get the most value out of your ticket.

Another bias called the endowment effect also contributes to our inability to let go of a bad idea. This bias makes us value or appreciate more what we have done or put effort into than an equivalent amount of work done by someone else. For example, we want more money for our own hard work than we would be willing to pay if someone else offered the same service to us. When combined with the sunk cost fallacy, it means we will keep on investing in what we already have an investment or contribution in, and this effect is strengthened by the fact that whatever investment there already is, we will subjectively overvalue it. The end effect makes us think that what we already have is worth more than the value given to it by the rest of the market. Unfortunately, the market is actually the determiner because it is the one paying for the final product via a merger, an acquisition or a floating on the stock exchange.

The endowment effect can stop us from realizing appropriately and at the right time that what we are really dealing with has little value. It makes us overvalue something and hang onto it longer than what may seem reasonable, throwing more gold into the coal furnace. Typical examples of this can be seen in many startups. We invest our time, effort and money, and then hold onto them sometimes a lot longer than is reasonable. Whereas an outsider, who doesn't have the same bias, would say "I give up," many an entrepreneur continues in an untenable situation only to fall harder than they would have if he or she had given up earlier.

Another major factor contributing to the habit of throwing good money after bad is the loss aversion bias as discussed earlier; people try to avoid the same value losses more than they will try to make the same value gains. This means they are more willing to take larger risks to avoid a loss than to achieve an identical gain. So as people lose more and the stakes increase, they are willing to bet more to gamble themselves out of a loss, à la IBM.

It seems that when we are in a bad situation our intuition and biases try to help us out by giving us the proverbial posterior boot. Big help! These biases, which probably helped save our ancestors in situations of life or death, now end up killing our financial judgment. It's not that these biases are completely useless, just that when faced with innovation decisions, if we end with a worthless innovation investment on our hands, our biases will make it harder to drop the lump of coal.

The critical thing to recognize is that the successful fruition of an innovation does require investment. Whether it be time or money, there are always decisions to be made as to how much and when. So it is important to be on top of the sunk cost fallacy, endowment effect and loss aversion when looking at reinvesting, whether in startups, new ideas, or simply your own business.

### **Strategies to beat this**

In the venture capital industry, companies and startups need to reach specific milestones before being given more money. If they don't, then they are mercilessly weaned off their funding teat. Having strict investment criteria like this can prevent you from even allowing yourself the possibility of reinvesting in bad eggs, because you already have fixed rules in place to stop it.

As easy as it may sound, this has its downside. Such a method prevents over-investing in lost causes, but what if the product or service you are developing is only one step away from a breakthrough. Is it not better to put in the last few cents to see it over the line? The uncertainty caused by this can make the previous strategy difficult to implement.

The fundamental strategy to beat the previous biases is to try to limit potential damage. This can be approached from the venture capital perspective above, but you can also achieve this by limiting the possible amounts you can lose via things such as diversification. So even if one innovation experiment fails, you have others to prop you up. In addition, investing in one idea is then always compared to others. So if you only have a fixed budget, then the opportunity cost of each investment decision will be weighed up and so if you necessarily cut a company off just before its critical breakthrough, then you can be happy knowing that the other opportunity you chose was better anyway. The final advantage is that spreading your bets also limits the amount you can invest in any one idea and if more money is necessary, it will force you to find others to share your investments. This may diminish your gains but also your losses.

Another way of dealing with the previous biases, like the sunk cost fallacy or endowment effect, is to forget what we've invested in. That is, every time we want to invest more in something (an asset), we need to study the investment like it was the first time we ever heard about the project. This allows us to assess innovation targets on their merits, irrespective of whether we have invested in them or not. A practical way of achieving this could be to ask someone else to do a blind review of the case without knowing the current investments in it. This can also be done to avoid the endowment effect in relation to things we own (think of a problematic car). Again a trusted, competent, independent opinion can be very valuable.

Strategies to beat the sunk cost fallacy and endowment effect can be summed up in a single sentence: save yourself money by saving yourself money! And there is no better way to lower the risk of your innovation investments than by limiting your financial losses.

## **Conclusion**

Improving our ability to make unbiased decisions will clearly reduce the level of risk involved in our innovations. It will stop us from overinvesting, provide us with a more logical valuation of our investments and grant us perspective when we need it most. If, however, we still find ourselves succumbing to intuition, gut feelings and other shortcuts to avoid longer considerations in our more commercial decisions, at least we can console ourselves that when stranded in a life or death situation on the savannahs of Africa, this skill would probably serve us better than a behavioral innovation optimized one!

*This was a sample of a chapter of the book, *Innovation Tools* by Evan Shellshear, get your copy today at <https://amzn.com/B01F3NDLP4>.*