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Data Analytics for IT Networks

Developing Innovative Use Cases

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Cisco Press

effect exists in their minds. However, before these people delivered successful outcomes that biased your hindsight to see them as innovative geniuses, who would have invested in their farfetched solutions?

Interestingly, this bias can be a great thing for you if you figure out how to set up innovative experimenting and "failing fast" such that you can try a lot of things in a short period of time. If you get a few quick wins under your belt, the halo effect works in your favor. If something is successful, then the hindsight bias may kick in. Sometimes called the "I-knew-it-all-along" effect, hindsight bias is the tendency to see past events as being predictable at the time those events happened. Kahneman also describes hindsight and outcome bias as "bias to look at the situation now and make a judgment about the decisions made to arrive at this situation or place."

When looking at the inverse of this bias, I particularly like Kahneman's quote in this area: "Actions that seemed prudent in foresight can look irresponsibly negligent in hindsight." I'd put it like this: "It seemed like a good idea at the time." These results bring unjust rewards to "risk takers" or those who simply "got lucky". If you try enough solutions through your innovative experimentation apparatus, perhaps you will get lucky and have a book written about you. Have you read stories and books about successful people or companies? You probably have. Such books sell because their subjects are successful, and people seek to learn how they got that way. There are also some books about why people or companies have failed. In both of these cases, hindsight bias is surely at play. If you were in the same situations as those people or companies when they made their fateful decisions, would you have made the same decisions without the benefit of the hindsight that you have now?

Summary

In this chapter, you have learned about cognitive biases. You have learned how they manifest in you and your stakeholders. Your understanding of these biases should already be at work, forcing you to examine things more closely, which is useful for innovation and creative thinking (covered in Chapter 6). You can expand your own mental models, challenge your preconceived notions, and understand your peers, stakeholders, and company meetings better. Use the information in Table 5-1 as a quick reference for selected biases at play as you go about your daily job.

Table 5-1   *Bias For and Against You*

Bias	Working Against You	Working for You
Anchoring, focalism	Stakeholders have an anchor that is not in line with yours.	Question and explore their impressions, their anchor values, and compare to yours.
Priming	Inadequate detail and negative connotation exist about where analytics help.	Understand their priming. Prime your context where your solution works best.
Imprinting	Things happen the same as they always have.	Find and present data and insight proving that change is possible.

Bias	Working Against You	Working for You
Narrative fallacy	This involves initial impressions about how things are and connecting unconnected dots.	Find and explain the correlations that are not causations. Find the real causes
Mirroring	You assume people see things as you do and do not correct your course. There is a communications gap.	Seek first to understand and then to be understood.
Availability	People rely on their LIFO first impressions.	Uncover and understand the reasons for their impressions. Learn their top of mind.
Recency, frequency	People have top-of-mind impressions based on recent events.	Find the statistics to prove whether it is or is not the norm.
Correlation is not causation	Co-occurrence of things triggers human pattern recognition and story creation.	Share the ice cream story, find the true causes, show that base-rate information also correlates.
HIPPO, authority	You work on things not critical to the success of your chain of command.	Take some time to learn the key players and learn what is important from the key players.
Confirmation, expectation, congruence	You torture the data until it shows exactly what you want to show.	Take another perspective and try to disprove what you have proven.
Experimenter's bias	You do not test enough to validate what you find. Others call that out.	Test the alternative hypothesis and take the other side. Try to prove yourself wrong.
Belief	As Occam's razor says, the simplest and most plausible answer is probably correct to people.	Research and find facts and real data from the problem domain to disprove beliefs.
Context	Current, top-of-mind conditions influence thinking.	Understand their perspective and context and walk a mile in their shoes.
Frequency illusion	It's crashing all the time now.	Create a new frequency. You are always coming up with cool new solutions.
Base-rate neglect, law of small numbers	Stakeholders observe an anomaly in a vacuum and take that to be the norm.	Find out where the incorrect data originated and bring the full data for analysis.
Survivorship bias	All systems seem to be just fine.	Include systems that were not included in the analysis for a complete picture.

Bias	Working Against You	Working for You
Group attribution error	This type of device has nothing but problems, and we need to replace them all.	Find the real root causes of problems.
WYSIATI (What You See Is All There Is)	Based on what we saw in our area, the network behaves this way when issue X happens.	Explore alternatives to the status quo. Show differences in other areas with real data and analysis.
Curse of knowledge	Key stakeholders tune you out because you do not speak the same language.	Technical storytelling to nontechnical audiences is a skill that will take you far. Learn to use metaphors and analogies.
Similarity	You leave important people out of the conversation and speak to technical in-group peers only.	Use analytics storytelling to cover both technical and nontechnical audiences. Listen.
Dunning-Kruger	Inexperienced people steer the conversation to their small area of knowledge. You lose the room.	Include the inexperienced people, teach them, and make them better. Learn new perspectives from their "left field" comments that resonate.
IKEA, not invented here, endowment	People fight to keep analysis methods and tools that they worked on instead of accepting your new innovations.	People you include in the process will feel a sense of ownership with you.
Pro-innovation	People are more excited about what they are inventing than about what you are inventing.	People you include in the process will feel a sense of ownership with you.
Status quo, sunk cost fallacy	Some people just do not like change and disruption, even if it is positive. They often call up sunk costs to defend their position.	Be prepared with a long list of benefits, uses, and financial impacts of your innovation.
Empathy gap	You are an engineer, and often the technology is more exciting to you than are the people.	Read and learn this section of the chapter again to raise awareness of others' thinking and reasoning.
Outcome bias, hindsight bias	Many companies have historically spent a lot of money on analytics that did not produce many useful models.	Highlight all the positive outcomes and uses of your innovation, especially long after you begin working on the next one.
Halo effect	Because you are new at data science, you don't have a halo in this space.	Build and deploy a few useful models for your company, and your halo grows.

Innovative Thinking Techniques

There are many different opinions about innovation in the media. Most ideas are not new but rather have resulted from altering atomic parts from other ideas enough that they fit into new spaces. Think of this process as mixing multiple Lego sets to come up with something even cooler than anything in the individual sets. Sometimes this is as easy as seeing things from a new perspective. Every new perspective that you can take gives you a broader picture of the context in which you can innovate.

It follows that a source of good innovation is being able to view problems and solutions from many perspectives and then choose from the best of those perspectives to come up with new and creative ways to approach your own problems. To do this, you must first know your own space well, and you must also have some ability to break out of your comfort zone (and biases). Breaking out of a "built over a long time" comfort zone can be especially difficult for technical types who learn how to develop deep focus. Deep focus can manifest as tunnel vision when trying to innovate.

Recall from Chapter 5, "Mental Models and Cognitive Bias," that once you know about something and you see and process it, it will not trip you up again. When it comes to expanding your thinking, knowing about your possible bias allows you to recognize that it has been shaping your thinking. This recognition opens up your thought processes and moves you toward innovative thinking. The goal here is to challenge your SME personality to stop, look, and listen—or at least slow down enough to expand upon the knowledge that is already there. You can expand your knowledge domain by forcing yourself to see things a bit differently and to think like not just an SME but also an innovator.

This chapter explores some common innovation tips and tricks for changing your perspective, gaining new ideas and pathways, and opening up new channels of ideas that you can combine with your mental models. This chapter, which draws on a few favorite techniques I have picked up over the years, discusses proven success factors used by successful innovators. The point is to teach you how to "act like an innovator" by discussing the

common activities employed by successful innovators and looking at how you can use these activities to open up your creative processes. If you are not an innovator yet, try to "fake it until you make it" in this chapter. You will come out the other side thinking more creatively (how much more creatively varies from person to person).

What is the link between innovation and bias? In simplest terms, *bias* is residual energy. For example, if you chew a piece of mint gum right now, everything that you taste in the near future is going to taste like mint until the bias the gum has left on your taste buds is gone. I believe you can use this kind of bias to your advantage. Much like cleansing the palette with sherbet between courses to remove residual flavors, if you bring awareness of bias to the forefront, you can be aware enough to know that taste may change. Then you are able to adjust for the flavor you are about to get. Maybe you want to experiment now with this mint bias. Try the chocolate before the sherbet to see what mint-chocolate flavor tastes like. That is innovation.

Acting Like an Innovator and Mindfulness

Are you now skeptical of what you know? Are you more apt to question things that you just intuitively knew? Are you thoughtfully considering why people in meetings are saying what they are saying and what their perspectives might be, such that they could say that? I hope so. Even if it is just a little bit. If you can expand your mind enough to uncover a single new use case, then you have full ROI (return on investment) for choosing this book to help you innovate.

In their book *The Innovator's DNA: Mastering the Five Skills of Disruptive Innovators*, Dyer, Gregersen, and Christensen describe five skills for discovering innovative ways of thinking: associating, questioning, observing, experimenting, and networking. You will gain a much deeper understanding of these techniques by adding that book to your reading list. This chapter includes discussion of those techniques in combination with other favorites and provides relevant examples for how to use them.

Now that Chapter 5 has helped you get your mind to this open state, let's examine innovation techniques you can practice. "Fake it till you make it" does not generally work well in technology because technology is complex, and there are many concrete facts to understand. However, innovation takes an open mind, and if "acting like an innovator" opens your mind, then "fake it till you make it" is actually working for you. Acting like an innovator is simply a means to an end for you—in this case, working toward 10,000 hours of practicing the skills for finding use cases so that you can be an analytics innovator.

What do you want to change? What habits are stopping you from innovating? Here is a short list to consider as you read this section and Chapter 7, "Analytics Use Cases and the Intuition Behind Them":

- Recognize your tunnel vision, intuition, hunches, and mental models. Use them for metaphoric thinking. Engage Kahneman's System 2 and challenge the first thought that pops into your head when something new is presented to you.

- Challenge everything you know with *why* questions. Why is it that way? Can it be different? Why does the solution use the current algorithm instead of other options? Why did your System 1 give that impression? What narrative did you just construct about what you just learned?

- Slow down and recognize your framing, your anchoring, and other biases that affect the way you are thinking. Try to supply some new anchors and new framing using techniques described in this chapter. Now what is your new perspective? What "Aha!" moments have you experienced?

- Use triggering questions to challenge yourself. Keep a list handy to run through them as you add knowledge of a new opportunity for innovation. The "five whys" engineering approach, described later in this chapter, is a favorite of many.

- Get outside perspectives by reading everything you can. Printed text, audio, video, and any other format of one-way information dissemination is loosely considered reading. Learn and understand both sides of each area, the pros and the cons, the for and the against. What do the pundits say? What do the noobs say? Who really knows what they are talking about? Who has opinions that prompt you to think differently?

- Get outside perspectives by interactively talking to people. I have talked to literally hundreds of people within Cisco about analytics and asked for their perspectives on analytics. In order to develop a common talking model, I developed the analytics infrastructure model and began to call analytics solutions *overlays* for abstraction purposes. In many of my conversations, although people were talking from different places in the analytics infrastructure model, they were all talking about areas of the same desired use case.

- Relax and give your creative side some time. Take notes to read back later. The most creative ideas happen when you let things simmer for a while. Let the new learning cook with your old knowledge and wisdom. Why do the best ideas come to you in the shower, in the car, or lying in bed at night? New things are cooking. Write them down as soon as you can for later review.

- Finally, practice the techniques you learn here and read the books that are referenced in this chapter and Chapter 5. Read them again. Practice some more. Remember that with 10,000 hours of deliberate practice, you can become an expert at anything. For some it will occur sooner and for others later. However, I doubt that anyone can develop an innovation superpower in just a few hundred hours.

Innovation Tips and Techniques

So how do you get started? Let's get both technical and abstract. Consider that you and your mental models are the "model" of who you are now and what you know. Given that you have a mathematical or algorithmic "model" of something, how can you change