Cutter IT Journal

The Journal of Information Technology Management

Vol. 27, No. 9
September 2014

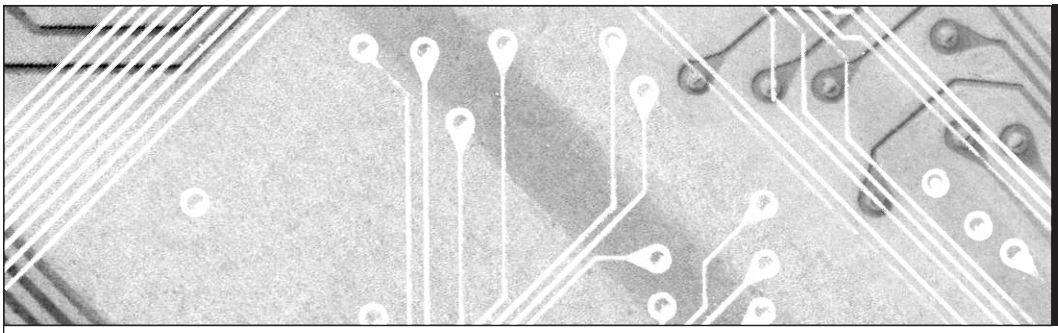
"Our decision making appears to improve when we increase awareness and communication about decisions and the principles we're using to make them. Establishing a method and criteria and laying out the alternatives allow us to critique and learn — both from our successes and from our failures."

— HIllel Glazer, Guest Editor

Decision Making:

Art, Science, or Alchemy?

CUTTER CONSORTIUM



Cutter IT Journal

About Cutter IT Journal

Part of Cutter Consortium's mission is to foster debate and dialogue on the business technology issues challenging enterprises today, helping organizations leverage IT for competitive advantage and business success. Cutter's philosophy is that most of the issues that managers face are complex enough to merit examination that goes beyond simple pronouncements. Founded in 1987 as *American Programmer* by Ed Yourdon, *Cutter IT Journal* is one of Cutter's key venues for debate.

The monthly *Cutter IT Journal* and its companion *Cutter IT Advisor* offer a variety of perspectives on the issues you're dealing with today. Armed with opinion, data, and advice, you'll be able to make the best decisions, employ the best practices, and choose the right strategies for your organization.

Unlike academic journals, *Cutter IT Journal* doesn't water down or delay its coverage of timely issues with lengthy peer reviews. Each month, our expert Guest Editor delivers articles by internationally known IT practitioners that include case studies, research findings, and experience-based opinion on the IT topics enterprises face today — not issues you were dealing with six months ago, or those that are so esoteric you might not ever need to learn from others' experiences. No other journal brings together so many cutting-edge thinkers or lets them speak so bluntly.

Cutter IT Journal subscribers consider the *Journal* a "consultancy in print" and liken each month's issue to the impassioned debates they participate in at the end of a day at a conference.

Every facet of IT — application integration, security, portfolio management, and testing, to name a few — plays a role in the success or failure of your organization's IT efforts. Only *Cutter IT Journal* and *Cutter IT Advisor* deliver a comprehensive treatment of these critical issues and help you make informed decisions about the strategies that can improve IT's performance.

Cutter IT Journal is unique in that it is written by IT professionals — people like you who face the same challenges and are under the same pressures to get the job done. *Cutter IT Journal* brings you frank, honest accounts of what works, what doesn't, and why.

Put your IT concerns in a business context. Discover the best ways to pitch new ideas to executive management. Ensure the success of your IT organization in an economy that encourages outsourcing and intense international competition. Avoid the common pitfalls and work smarter while under tighter constraints. You'll learn how to do all this and more when you subscribe to *Cutter IT Journal*.

Cutter IT Journal®

Cutter Business Technology Council: Rob Austin, Ron Blitstein, Tom DeMarco, Lynne Ellyn, Israel Gat, Vince Kellen, Tim Lister, Lou Mazzucchelli, Ken Orr, and Robert D. Scott

Editor Emeritus: Ed Yourdon
Publisher: Karen Fine Coburn
Group Publisher: Chris Generali
Managing Editor: Karen Pasley
Production Editor: Linda M. Dias
Client Services: service@cutter.com

Cutter IT Journal® is published 12 times a year by Cutter Information LLC, 37 Broadway, Suite 1, Arlington, MA 02474-5552, USA (Tel: +1 781 648 8700; Fax: +1 781 648 8707; Email: citjeditorial@cutter.com; Website: www.cutter.com; Twitter: @cuttertweets; Facebook: Cutter Consortium). Print ISSN: 1522-7383; online/electronic ISSN: 1554-5946.

Subscription rates are US $485 a year in North America, US $585 elsewhere, payable to Cutter Information LLC. Reprints, bulk purchases, past issues, and multiple subscription and site license rates are available on request.

Opening Statement

by Hillel Glazer, Guest Editor

It should come as no surprise that decision making in some flavor or another is at the heart of nearly every business book, method, conference, and article. After all, especially in business, what are we trying to learn from the past if not the answer to "Why?" or "How did they do that?"

Looking at any project or process technique, any analysis, any case study on nearly any topic, ultimately what we're after is making sense of the means and the ends. Any metric, measure, or indicator is — when used properly — merely a trigger, tripwire, forecast, or estimate of something moving us in one direction or another. All of training, organizational development, and even Lean and Agile techniques can be distilled down to some facet of either distributing or consolidating decision-making powers.

Clearly this is a complex topic, and one we're probably never going to get a satisfying answer on. In a recent three-part series of Cutter *Executive Updates*,[1] I took on decision making from a deterministic vs. probabilistic perspective. I suggested that deterministic decision making — decision making based on analysis of and logic applied to older data — is overused and slows down innovation, among other problems. I argued that many operations would do well to identify places where probabilistic decision making would save time and effort and produce better results, while eliminating a host of issues deterministic methods induce.

However, whether or not to use probabilistic decision making isn't the only aspect of decision making to consider. There are matters of culture, bias, management techniques, empowerment, and autonomy. There's collective, centralized, and distributed decision making. There's decision making from the individual perspective, at the national or global level, and everything in between. There are issues of motivation, influence, and social pressures. Truly, there is no end to the topic.

If the topic is as vast and unending as it seems, how could we do it justice?

We don't. Here, we concede defeat.

By this, I don't mean that we're defeated because we can't definitively "solve" the decision-making "problem." Rather, we must all accept that decision making is (to borrow terms from David Snowden's Cynefin complexity framework) beyond *complicated*; it's *complex*, if not *chaotic*.[2] We know decision making is not simple, yet we see so many attempts to simplify it. We know that a room full of experts doesn't always come up with the best decision, but we often try that too and stop further investigation when they come up with a pearl of wisdom. We also know that the power of numbers doesn't always yield better insights than a roll of the dice, and yet we prefer the former method to the latter one. Or do we?

We didn't put this issue together to ruin your week. We put it together to arm you with insights.

It turns out that, sometimes, all of our decision-making exertions are still not much better than rolling dice because we all too frequently leave something important out. Just as often we put too much emphasis on less relevant information or define the context poorly. In this issue we will be asking a lot of questions. Is our decision-making approach truly robust? Can we look back on our prior (not great) decisions and be honest about what was lacking that led us toward the missed step? Are we relying too much on past history? Are we not seeing the best information? Are we blind to how culture plays a role? Do we know what's really driving our decisions?

Our goal in this issue is not to put a finite point on decision making but to expose ourselves to the vast array of decision-making complexities. All of this issue's articles give us more to think about, as well as practical tools. We didn't put this issue together to ruin your week. We put it together to arm you with insights.

We are confident that readers will store some of the ideas we deliver here somewhere in the backs of their minds and that this information will be triggered at an appropriate time.

Be sure to note the detailed table. There will be a quiz.

IN THIS ISSUE

In this edition of *Cutter IT Journal*, our authors offer us five distinct perspectives on decision making. We kick things off with Paul Clermont's humanistic take on the salient themes involved in making decisions. Clermont looks at several of the most common decision-making pitfalls, both in general and as they particularly relate to IT and its management. The relatively straightforward "failure to verify supposedly factual information" and "failure to learn from history" are points we can deal with immediately, whereas "confirmation bias" (and many other biases) and failure due to "flawed analogies" are entire fields of research unto themselves. Clermont pokes well-deserved holes in many decision-making modes, including the illogic of sticking with established policies, processes, or plans even in the face of a reality that no longer plays along with our outdated thinking. Near his close, Clermont provides us with interesting vignettes and historical perspectives that demonstrate practical decision-making applications in a number of situations. Be sure to keep an eye out for the ways in which IT can hinder good decision making as much as it can help.

Jim Benson, well-known for his work in Lean and Personal Kanban, comes at decision making from the fundamental perspective of processing the information on which we base our decisions. Benson looks at how information is presented to us, arguing that our ability to make decisions is strongly driven by how hard we have to work in order to understand and use what we're given. When information is presented visually, we can make sense of it more easily, and our decision making is more effective as a result. Benson describes and depicts (with figures — no surprise) how a simple kanban board is rich with decision-making power, and he presents three strong case studies to help us see how such visualization supports decision making. In one, he explains how middle managers in the heart of a century-old institution are able to find better ways of working together. In the next, he explains how deep skepticism and learned helplessness were reversed. And in the last, he explains how visualization enabled customers to play a part in getting delivery problems to become "unstuck."

Staking a bit of an edgier position, Martin Bauer questions whether we can really do anything to improve our decision making. He brings out many well-researched points about the nature (or nurture) of making decisions and explains that, much of the time, our decisions may be rendered irrelevant by the many factors we can't control. Among these are the human susceptibility to irrationality (which manifests itself in unthinking risk aversion, "anchoring," and more) and the entirely uncontrollable impact of random events. Not that Bauer's contribution is all hand-wringing, though. Forewarned is forearmed, after all, and Bauer offers strategies for combating irrationalities — whether our own or those of others — and tips for effective "Plan B-ing" should randomness strike.

In our fourth article, decision making goes global, as researcher Sharon Glazer and practitioner Tamas Karpati take on the incredibly deep topic of culture's effect on decision making. In this issue's most thoroughly endnoted submission, the authors craft a primer to school us on just a few aspects of culture that influence how decisions are not only made, but also on how they are *received*, which is often governed as much by the way decision making is conducted as by the decisions themselves. The notion of corporate culture, national culture, and the values these cultures impart

UPCOMING TOPICS IN CUTTER IT JOURNAL

OCTOBER

Dave Rooney

Agile in the Real World

NOVEMBER

Ron Zahavi and Alan Hakimi

The IoT: Technologies, Opportunities, and Solution

DECEMBER

Sebastian Hassinger

Mobile Security: Managing the Madness

play no small role in the overall decision-making ecosystem. It's validating to see terms many readers are familiar with from Daniel Pink's book *Drive*[3] — such as "autonomy," "harmony," and "mastery" — appear in frameworks taken from the original research. Of course, this is only a fraction of the important ground covered in Glazer and Karpati's rich piece. If you think this article has little to do with you, consider the lesson to have begun. Be sure to note the detailed table. There will be a quiz.

We close this issue with Sachin Mahajan's hypothetical case narrative about a year in the life of a decision maker. The story quickly shifts to a tutorial in which Mahajan dissects decision making into quantitative and qualitative approaches. He provides detailed analyses of each approach and looks at why we need both — in nearly every decision. Mahajan also strongly argues that we must never assume our decision-making processes are static; they need to evolve as our businesses and IT operations evolve. Mahajan's detailed diagrams are a gift to consultants. One could create a workshop around each of them! Short of that, readers can use his detailed explanation of the underlying currents flowing within decisions to take a deep look at the makeup of a particular decision and to understand the dynamics at play. Often, these dynamics are entirely overlooked — which explains many of the not-so-great conclusions people draw when making decisions. No, I didn't give away the ending. This story's end is not in the "end," it's in the process of getting there. You need to read Mahajan's piece to see everything along the way.

PARTING THOUGHTS

These five articles demonstrate the wide range and the many depths of decision making. As is so often the case, context appears to be the single common thread. No one approach will work for everything. No one set of attributes will apply across the board. If nothing else, we must be clear about the need for making a decision. We must know what we are trying to achieve and which characteristics of the outcome are important to us. We have to account for the many attributes and many stakeholders involved.

Our decision making appears to improve when we increase awareness and communication about decisions and the principles we're using to make them. Establishing a method and criteria and laying out the alternatives allow us to critique and learn — both from our successes and from our failures. When we must roll the dice, knowing that rolling the dice is our only option is better than rolling the dice while ignoring more obvious and better choices.

When we must roll the dice, knowing that rolling the dice is our only option is better than rolling the dice while ignoring more obvious and better choices.

We hope this issue of *Cutter IT Journal* will serve as a reference the next time a major decision comes up and you want some expert advice in your back pocket. But please, don't keep your need to make a decision a secret or think you're all alone in making it. For your greatest chance of success, our authors would urge you to be as obvious and transparent about the decision as your culture will allow. Having said that, a little luck never hurts.

ENDNOTES

[1]Glazer, Hillel. "You're Doing It Wrong: Parts I-III." Cutter Consortium Business Technology Strategies *Executive Update*, Vol. 17, Nos. 3, 5, and 7, 2014.

[2]Snowden, David J., and Mary E. Boone. "A Leader's Framework for Decision Making." *Harvard Business Review*, November 2007.

[3]Pink, Daniel H. *Drive: The Surprising Truth About What Motivates Us*. Riverhead, 2009.

Hillel Glazer is a Senior Consultant with Cutter Consortium's Agile Product & Project Management *practice. He is founder, Principal, CEO, and all-around Performance Jedi of Entinex, Inc., a company with global reach that focuses on generating powerful results for high-performance operations among companies motivated to be Lean, Agile, and achieve world-class levels of operational excellence.*

Mr. Glazer's work in Lean and systems thinking began in 1991, and since then he has become the world's leading authority on bringing Lean and Agile values and principles into highly regulated industries that demand compliance and governance while in pursuit of excellence and profits. Leveraging his education and experience as an aerospace engineer, he solves hairy, complex business problems with the same creativity and discipline used to put people on the moon and grandparents at graduations. By seeing clearly into complex problems, Mr. Glazer finds the root of difficult business operational issues, exposes what's going on, and then works with companies to find, design, and implement simple, elegant solutions to lower costs, raise profits, foster innovation, and improve quality and speed responsivity to the market. His book High Performance Operations: Leverage Compliance to Lower Costs, Increase Profits, and Gain Competitive Advantage *lays out exactly how he does it. He can be reached at hglazer@cutter.com.*

When You Must Make Hard Choices

by Paul Clermont

Decisions, decisions. We may dread having to make them, but we know we'll feel a sense of relief once they're made … unless we don't, when doubts (aka "buyer's remorse") intrude. We'll feel satisfaction when our decisions turn out to have been good ones, and we'll grind our teeth when they don't, but how much do we learn from either outcome? Some of us — who tend to be leaders — almost enjoy making decisions, but are such people better decision makers than others who are more deliberate? Not necessarily. Decisiveness is generally considered a virtue, but being decisive for its own sake can be as dangerous as protracted vacillation.

Some decisions are made in an information-rich environment, where the quality of a decision is directly related to our ability to process that information. The game of chess is the ultimate example; once computers got powerful enough, they could blow away grand masters. But few real-world decisions of consequence are like that. Most are more like poker, where there is a limited amount of hard information available, and success depends on making inferences from softer information like others' betting and squishy factors like reading your opponents (are they for real or bluffing?) while making yourself as unreadable as possible. Decisions in business — at least those that are not purely technical — share poker's need for going well beyond cool, rational analysis of hard data. Decisions in government invariably do, especially in a democracy.

GOOD DECISIONS: A MIX OF SCIENCE AND ART (WITH A TOUCH OF ALCHEMY)

The objective of any decision is to achieve the best possible outcome based on what we can reasonably be expected to have known and understood at the time we made the decision. What do we need in order to decide? Beginning with the *science* part first, we need:

- **Facts**, obviously, but they must be carefully distinguished from opinions, beliefs, assumptions, conventional wisdom, and hopes. Not that those aren't sometimes useful, but we need to recognize them for what they are and treat them accordingly. Specific facts we need include details of the situation, our options, risks, rewards, and constraints, as well as the urgency of the situation and the consequences of inaction.
- **Insights** developed from personal experience and comparison with historical analogs and precedents.
- **Logic** and **reasoning** are essential in making sense of how the things we know, believe, and assume interrelate and apply to the situation at hand. Game theory, a branch of mathematics, can be helpful in cases where a number of options are available and you want, for example, to minimize how bad the worst case would be, which is not necessarily the same as maximizing how good the best case could be.

These ingredients are necessary but not sufficient for good decision making, and this is where *art* gets into the mix. Emotions matter, our own and those of others. There's a reason Captain Kirk was in charge of the *Enterprise* rather than Mr. Spock.

We need to know *ourselves* — our tendencies, style, biases, self-image, and the image we want to project — plus our own culture's beliefs, norms, and expectations and how those factors may affect our decisions for good or ill.

We need to understand our environment — the *people* whom our decision will affect, the *cultures* in which those people live and work, and the *politics* (i.e., stakeholders who may or may not be willing to influence people and nudge culture).

Judgment is what good decision makers use to bring all these ingredients (calling them "tools" suggests they're more mechanistic than they actually are) together in the right proportion. The critical element is pragmatism, which comprises both science and art. Inquisitiveness and healthy skepticism are essential in making judgments. Like art, which it is, good decision making is hard to teach. Some fortunate people are naturals at it. Others can learn from mentors, examples, and mistakes. Still others never quite get the knack.

Unfortunately, an optimally made decision is not enough to guarantee a good outcome. There's also *luck*. Some well-made decisions inevitably prove wrong for reasons that could not have been anticipated, and some badly

made ones back their way into fortuitous success. Both present "teachable moments" if we let them. Too often we punish those responsible for well-made decisions that don't pan out and reward the alchemists lucky enough to have gold paint spill on their lead. (Clairvoyance can be safely dismissed as an explanation for success!)

Adaptation and Flexibility

A decision is made at a given time, but few decisions once made are truly irrevocable in the face of changing circumstances and new information. While a U-turn without a compelling reason can be politically difficult, there is usually wiggle room for modifying goals and milestones and even approaches. Charging ahead regardless may seem heroic, but it is usually costly and futile. When things are not going as planned, the immediate question is what to do differently. For example, should we change the relative attention paid to the various ingredients? Do we need more rigor or formality in the analyses?

Course corrections are also teachable moments. Could we reasonably be expected to have anticipated the new circumstances, and if we could have, why didn't we? Is there a pattern of analysis or behavior that could be improved for the future?

THE ROLE OF IT

People made decisions for many millennia without the benefit of IT, and it's not self-evident that we make our really big decisions in the computer age consistently better than before. Smaller decisions, in relatively information-rich situations, are another matter. But IT, properly used, has become and will continue to be important to decision makers in critical ways:

- IT is really good at collecting, storing, retrieving, and analyzing facts and making them instantly available everywhere. The more heavily a good decision requires and relies on facts and rigorous analysis versus the other ingredients noted above, the more helpful IT can be.
- By shortening the time between when decisions are made and when their results can be seen (so that decision makers can analyze and act on them), decisions can become much smaller in scope, thus limiting their risk. While many more such decisions are needed, the sheer volume of data collected can help decision makers improve their rules and guidelines. (See sidebar "Zara: Shortening the Decision Cycle.")
- IT can help identify in a timely way when decisions are needed, for example, by early detection of problems and trends through dashboards, executive support systems, and business intelligence.

It should be obvious, but it bears repeating in view of the recent scandals that have rocked US veterans' hospitals: the information upon which decisions are based *must be accurate*! There's no room for fudges, and a culture that tolerates them (or even encourages them with a nudge and a wink) has to change. So the more information that can be gathered and transmitted directly, without the opportunity for creative massaging along the way, the better. (Zara has done this.)

ZARA: SHORTENING THE DECISION CYCLE

Zara is a ubiquitous (in Europe) chain of clothing shops catering to young women who want to be fashionable but have only a limited clothing budget. This is not an easy clientele. Their tastes can be very fickle, and some seemingly inspired ideas just don't catch on. Most retailers in that space cannot afford to have garments made in high-wage Europe, so they rely on China and other low-wage countries for their production. While this lowers the unit costs, the lengthy supply chain stretches the turnaround times for changing the mix of products — styles, cuts, colors, sizes — and the markets to which they're sent. Thus, the stakes of these product decisions are high, and the error rate in making them is reflected in the prevalence of clearance sales with markdowns of as much as 70%-80%. And what never makes it to the financial statement is the opportunity loss when an item is an unanticipated hot seller and the retailer can't get it to the shops before the customers move on.

Zara had a different idea.[1] They made their products in Spain, their home country, in small workshops close to their distribution facility. How could they afford this? They used IT to reduce the scope, and thus the risk, of their product decisions. By capturing extensive product data at the point of sale, transmitting it in near real time to headquarters, and analyzing it quickly and thoroughly, they could very rapidly change work orders and production runs to increase the supply of what sold well and decrease or eliminate production of what didn't. They could also quickly reallocate products from one market to another if, for example, Dutch women liked something German women didn't. The result was a near absence of clearance sales. Everybody won. Customers got what they wanted, Zara made money, and Spaniards got good jobs.

[1]McAfee, Andrew, Anders Sjoman, and Vincent Dessain. "Zara: IT for Fast Fashion." HBS Case Study No. 604081-PDF-ENG. Harvard Business School, 25 June 2004.

HOW DECISION MAKING GOES WRONG

It is hard to generalize what makes someone a good decision maker, other than having the intelligence, wisdom, and temperament to avoid common pitfalls. Some pitfalls are not IT-specific, although they can apply to IT. Others relate to decisions that apply broadly but particularly bedevil the work of IT people. Most important are pitfalls that IT itself can mitigate or amplify.

General Pitfalls That Also Apply to IT Management

- **Failure to verify supposedly factual information.** If you put garbage into your decision making, you'll get garbage decisions out. Managers in some US veterans' hospitals concealed critical information about their performance from executives in Washington, who never knew there was a problem until they were blindsided by its revelation. And just because IT can make information look highly authoritative, replete with clever graphics, it doesn't make that information any more intrinsically reliable than a scribble on the back of an envelope. As US President Ronald Reagan famously said, "Trust but verify."
- **Failure to challenge received opinions, assumptions, and beliefs,** whether our own or those of others. Examples of this failure could fill several books — and have — but here are a few specific cases: the infamous weapons of mass destruction that weren't in Iraq, Microsoft's failure to recognize the central importance of the Internet even as late as 1995,[1] and intelligence fiascos like the Bay of Pigs.[2] Another example is the failure of America's big three automakers to even try to comprehend why drivers began flocking to imports. In the mid-1980s, I interviewed a number of US auto industry executives. While they knew their respective companies had serious problems, they professed (and probably even believed) that their products were the best in the world, and that their declining market share was due to those devious foreigners planting doubts in American minds.
- **Confirmation bias,** which occurs when we subconsciously screen out information that doesn't agree with what we believe to be true. This is a particularly insidious form of the previous pitfall, because we're typically not even aware that we're doing it. Nobody is immune; the only countermeasure is constant examination and reflection to sort what we really know from what we or others *think* is true.
- **Closing off options by deciding prematurely (or tardily).** Decisive people fear tardiness much more than the opposite, making prematurity their more likely pitfall. We've all done things that have gone wrong and then said, "If only I'd known." Too often we *could* have known but did not want to take the time to learn more, or perhaps at some level we didn't want to learn something that would dissuade us from making the decision we wanted to make — a conscious form of confirmation bias. Again, the US invasion of Iraq comes to mind, where the haste to have the war over before the brutal Iraqi summer arrived caused the premature cessation of the UN inspection, which had up to then revealed no weapons of mass destruction (as in reality none existed).

  In 1993, a client of mine had to choose between Windows and IBM's OS/2, when it was still unclear which one would dominate desktops. Since a great deal of reengineering and business analysis for this project needed to be thought through, the company could have postponed the operating system decision by a few months, which would have revealed a lot. But it chose OS/2, just to get that particular decision behind them.

  In contrast, the phrase "overtaken by events" describes the situation where options fall off the table before a decision is made, sometimes to the point where the decision is made for you. If it's not the decision you would have wanted, well …
- **Going too countercultural.** If the best decision we can conjure up is one that the culture will actively resist or passively undermine, it's not the right decision. For example, even many proponents of abortion rights now admit that the US Supreme Court's 1973 *Roe v. Wade* decision may have been too far ahead of its time, occurring before the political process could gain traction. It provoked a furious reaction across the US that persists to this day. By contrast, most other western countries, even ones at least nominally Catholic, moved later on legalizing abortion, and their protests are insignificant. An IT example would be installing a production and inventory control system that depends on timely, accurate input in a fudge-tolerant culture without first having implemented a serious change management program.
- **Failure to learn from history.** "This time it's different," we're often told. Few endeavors suffer as much as IT from optimism uninformed by bitter experience. "Yes, we've had our problems with previous initiatives, but this time we're using Agile techniques,[3] so not to worry."
- **Overlearning from history with flawed analogies.** How often do we hear that "we tried that back in '03, and it didn't work"? Nuances matter. Sunday morning talking heads are quick to invoke Munich[4] or

Vietnam as facile shorthand according to whether they are, respectively, for or against US action in some international trouble spot. It's a convenient way to avoid having to think through the nuances.

- **Getting caught up in events** and losing sight — until it's too late — of options to go our own way. A sterling example is the way Europe's great powers lurched into the bloodbath of World War I. (See sidebar "Exactly a Century Ago.") As things start to go wrong in an IT project, the project can go into a death spiral when nobody stops to look at the bigger picture instead of just "staying the course."
- **Machismo,** or making decisions quickly to demonstrate strength and *cojones*. Bullying and browbeating are often involved, as the decision maker exercises political clout to force his or her will, declaring that "failure is not an option."
- **Groupthink.** Participants get caught up in mutually reinforcing enthusiasm, drowning out questions and voices of caution.
- **Doubling down.** There's a saying that when you find yourself at the bottom of a hole, stop digging. Too often we switch to a bigger shovel (e.g., responding to a troubled project by adding staff who will only trip over one another) rather than understanding and adapting to the new reality.
- **Freezing up in the face of seemingly overwhelming disaster.** The hyper-urgent actions taken to keep the financial system from imploding in 2008[5] were nothing the principals would want to do, or ever dreamt of doing, but they emerged as the least awful alternatives. Near equivalents in IT are events like natural disasters that take down vital infrastructure or cyber attacks that steal data, where organizations don't have the luxury of time for figuring out the ideal solution.
- **Overly rigid adherence to abstract principles or standard procedures.** The words "always" and "never" can be dangerous when taken too literally. This is particularly true in dire situations, where "I did it by the book" is no defense for letting a disaster get worse. As boxer Mike Tyson said, "Everybody has a plan until they get punched in the face."
- **Making decisions too close to the vest** even when secrecy is not critical, thus losing out on potential sources of knowledge and insight as well as reducing the scope of ownership. In IT projects, it's almost always a mistake to try to work around a difficult person who wields political clout that could affect the project's success.
- **Death by a thousand cuts** is where there is no one disastrous big decision, but rather a pattern of badly made small ones reflecting a dysfunctional culture. General Motors' recently revealed problems with ignition switches and the cavalier treatment this deadly defect received for years is an example. In the IT world, it could be a culture of tacitly allowing scope creep, missed deadlines, empty promises, or shading of the truth when reporting progress.
- **Letting long-term success blind us** to changing realities so that we don't see the need for decisions. In IT, this could apply to security. Just because we've fended off cyber attacks and hackers for years doesn't mean there aren't some very talented criminals out there on the track of our inevitable vulnerabilities.

EXACTLY A CENTURY AGO

Bosnia and Herzegovina, a province of the Austro-Hungarian Empire, was home to a substantial number of ethnic Serbs, some of whom wanted to become part of the neighboring Kingdom of Serbia. One such person was Gavrilo Princip, a member of an underground movement covertly supported by the Serbian government, who assassinated Archduke Franz Ferdinand (crown prince of Austria-Hungary) and his wife in Sarajevo on 28 June 1914. Serbia's response was deemed inadequate by the Austrians, who declared war. Serbia was allied with Russia, who was in turn allied with France and the UK. Meanwhile, Germany and the Ottoman Empire were allied with Austria-Hungary. Instead of finding a way to defuse the crisis, the nations in question invoked these alliances, and most of Europe ended up at war by the end of the summer. Assigning blame for this catastrophe has occupied historians ever since, but the point here is that nobody important had enough perspective to halt the lunacy.

Pitfalls That Apply Particularly to IT Management

- **Letting perfection get in the way of improvement.** There is a natural tendency, particularly in IT projects, to load on features, which results in bloat and budget- and schedule-busting complexity.
- **Failure to recognize the probabilistic (rather than deterministic) nature of events,** which leads to inadequate risk analyses and failure to develop contingency plans. No IT function lacks horror stories about projects going terribly wrong when tasks proved more

difficult than anyone could have imagined, products did not meet expectations, vendors and contractors failed to deliver, or intended users did not effectively communicate their needs, any of which can derail a project. All the promises may have been made in good faith, with nobody's head belonging on a pike, except possibly that of the decision maker who assumed the suspension of Murphy's Law. One of my clients tried to portray reality by showing a "worst case" scenario that went 20% over budget. I shouldn't have needed to point out that IT projects that come in "only" 20% over budget are usually occasions for high-fives.

- **Not anticipating the reactions of those who are affected by a decision** but were not a party to it, and thus feel no ownership. IT functions have rich experience in this as well. So many IT-based innovations have fallen short or failed outright due to insufficient consultation with the intended beneficiaries, an oversight that is often compounded by insufficient preparation and training. This is mostly not IT people's fault, except insofar as they failed to insist on more rigorous change management and introduction processes. (Of course, that would not be politically easy in most environments.)

Pitfalls in the Use of IT for Decision Making

- **Letting quantitative analyses crowd out the qualitative.** The use of surrogate or indirect measures is appropriate when direct measures are impossible or impractically expensive. The problem comes from using them as the only measures, especially for high-stakes decisions. It's even more problematic when the surrogate measures can be gamed by people who will be impacted by them. (See sidebar "Measurement Gone Wrong.")

MEASUREMENT GONE WRONG

Early skeptics about the No Child Left Behind program to improve US public education predicted that teachers would begin to "teach to the tests" as opposed to educating students more broadly. Of course that happened, but it got even worse. Because the stakes were high — not showing yearly progress as measured by standardized tests could result in school closures and loss of funding and jobs — there was a strong incentive to cheat. Massive fraud was uncovered in Atlanta, where teachers "corrected" students' exam sheets in some low-performing schools. Tacit approval from above has left teachers and highly placed administrators with ruined careers and possibly facing prison time.

- **Insufficient skepticism about numbers.** Numbers convey a level of exactness that can become an intellectual shortcut, obscuring the need for more in-depth understanding of just how they are derived and what they do and don't tell us. (As Mark Twain said, "There are lies, damned lies, and statistics.") Why should we believe they capture the essentials we need to support good decisions? What possibly essential information is not captured? Measurement of social systems is as much or more art than science. How we phrase the question or describe what we want measured can profoundly influence the quality and usefulness of the information we receive. Just ask any political pollster about this.
- **IT's great strength can be its weakness.** Because IT is so good at manipulating and presenting information in a way that just seems so credible, it amplifies our tendency toward overreliance on it.
- **Big data can easily become big misinformation.** "Data scientist" is an impressive new job title, but like science practiced at a laboratory bench, there's a lot of janitorial work involved. As reported recently in the *New York Times*, "Data scientists, according to interviews and expert estimates, spend from 50% to 80% of their time mired in this more mundane labor of collecting and preparing unruly digital data, before it can be explored for useful nuggets."[6] As anyone who has ever tried to merge different coding schemes or scrub a mailing list knows, this kind of work is painstaking, frustrating, and a bit boring. Since "done" is not unambiguously definable, it's easy to take shortcuts in response to business pressure. Sometimes that's necessary and appropriate, but never without caveats.
- **Analysis paralysis** is aided and abetted by IT's ability to produce endless scenarios for us to analyze and compare.

TACKLING A QUINTESSENTIALLY HUMAN CHALLENGE

Decisions can affect the next five seconds or the next five centuries. Decision-making techniques, using that term loosely, range from carefully crafted algorithms to "seat of the pants"; each approach has its role. Since the ability to decide is what makes us human, decision making showcases every human foible. Our lives and the world we live in have been shaped for good or ill by an infinity of decisions. As long as humankind exists, people will analyze and try to improve how we make decisions. And while some of us — those in powerful positions, we hope — should gradually get better at it, progress won't be monotonic, and there is no endpoint.

Nevertheless, we must chip away, trying to learn from past mistakes — our own and those of others. We can do that by reading history, psychology, and classic stories. (See sidebar "A Rich Subject.")

Here are four guidelines that apply to decision makers at all levels:

1. **Be inquisitive.** Ensure you really understand the nature of the decision and its ramifications. Asking lots of questions is a sign of wisdom, not a confession of ignorance.
2. **Be skeptical.** Don't just accept answers at face value.
3. **Be diligent.** Making good decisions is not easy; tools and techniques can help, but only if their limitations are understood. If not, they're dangerous.
4. **Be humble.** Nobody is immune to mistakes, and surrounding oneself with yes-people greatly increases the likelihood of going wrong. The destruction caused by hubris over the millennia is incalculable.

ENDNOTES

[1]Bill Gates' book *The Road Ahead*, published that year, barely mentioned it.

[2]In 1961, the CIA was sure that a small-scale invasion of Cuba would topple Fidel Castro. The force, such as it was, landed at the Bay of Pigs and was ignominiously defeated. Allen Dulles, the long-time CIA director Kennedy inherited, was consequently ousted.

[3]This is not to single out Agile. There is a long history of promising techniques that didn't deliver all they promised.

[4]In 1938, Britain, France, and Nazi Germany made an agreement in Munich to let Germany annex predominantly German-speaking parts of Czechoslovakia. Prime Minister Chamberlain said that the pact would assure "peace in our time."

[5]Geithner, Timothy. *Stress Test: Reflections on Financial Crises*. Crown Publishers, 2014.

[6]Lohr, Steve. "For Big-Data Scientists, 'Janitor Work' Is Key Hurdle to Insights." *The New York Times*, 17 August 2014.

Paul Clermont has been a consultant in IT strategy, governance, and management for 30 years. Before going into individual practice, he was a Principal with Nolan, Norton & Co., a boutique consultancy that became part of KPMG. His clients have been primarily in the financial and manufacturing industries, as well as the US government. Mr. Clermont has spoken and written and taught executive MBA courses on the challenges of getting significant and predictable value from IT investments. Before joining Nolan, Norton & Co., he directed IT strategy at a major Boston bank and launched its IT executive steering committee. His undergraduate and graduate education at MIT's Sloan School of Management was heavily oriented toward operations research. Mr. Clermont is based in San Francisco and can be reached at clermontconsulting@gmail.com.

A RICH SUBJECT

The literature on decision making is plentiful. Here are three terrific books that have influenced my own thinking profoundly:

1. *Thinking, Fast and Slow*,[1] by Daniel Kahneman, examines a wide variety of cases in which we quickly and almost instinctively think and act in ways that don't make sense when subjected to slower, more deliberate thinking. Kahneman is a psychologist with a Nobel Prize for his ground-breaking work in behavioral economics.
2. *The Best and the Brightest*,[2] by David Halberstam, dissects how some of the US's most brilliant and respected statesmen, generals, analytical thinkers, and politicians got the country into the Vietnam War.
3. *Stress Test*,[3] by Timothy Geithner, recounts from the inside how a collapse of the world's financial system was narrowly averted in 2008. It dramatically shows how important it is when every option has terrible downsides to keep one's head and home in on the least bad choice, even though it is guaranteed to elicit slings and arrows from the sidelines.

Also, Barbara Tuchman's view of history as more shaped by screw-ups than brilliance is a rich source of examples, particularly *The March of Folly*,[4] which examines four big ones:

1. The Trojans' decision to move the Greek horse within the walls of their city
2. The refusal of Renaissance-era Popes to arrest the growing corruption of their church, thus leading to the Protestant secession
3. Misrule that cost England 13 of her American colonies
4. America's mishandling of the conflict in Vietnam (again)

Finally, classic tales from the Old Testament and Homer and tragedies from the Greeks and Shakespeare show us how little human nature has changed over the ages.

[1]Kahneman, Daniel. *Thinking, Fast and Slow*. Farrar, Straus and Giroux, 2011.

[2]Halberstam, David. *The Best and the Brightest*. Random House, 1972.

[3]Geithner, Timothy F. *Stress Test: Reflections on Financial Crises*. Crown Publishers, 2014.

[4]Tuchman, Barbara W. *The March of Folly: From Troy to Vietnam*. Knopf, 1984.

How to Stop Making Decisions in the Dark

by Jim Benson

Our brains are highly developed to process visual information. Yet we manage our projects blind. We make decisions blind.

Books and articles about ways to visualize work abound, but few of these actually allow us to build a working model of our projects. They are, at best, snapshots. With kanban boards, teams can build working real-time visual models of projects that show past, present, and future states, real-time personnel assignments, who is starved for work, who is overloaded, where projects are bogged down, the true level of completion, unplanned work, and more. In short, with kanban, companies are creating full-scale management systems that benefit everyone from the individual contributor, to the team leads, to the middle managers, to C-level executives.

The fact that this is a visual model is extremely important. Other systems tend to hide information and context. To illustrate, what if you asked me "What does Seattle look like?" and I listed for you:

- Seattle
- Bellevue
- Mercer Island
- Ballard
- West Seattle
- Magnolia
- Puget Sound
- Lake Union
- University District
- Lake Washington
- I-5
- I-90
- SR-520

You can already see this long list of information is devoid of context, takes a while to read, and leaves us with more questions.

Currently, this is how we plan and execute most projects. Therefore, this is how we make most decisions. We receive the data, but we don't get the picture.

In contrast, take a look at Figure 1, which shows a map of the Seattle area. Even if you have never been to Seattle and know nothing about it, a simple glance at the map shows you where the water is, where the major roadways are, where neighborhoods are, and the names of a few suburbs. You get a much better sense of how it all comes together.

All our plans, all our forecasts, and much of our work happens in our heads. We may write it down, but much of it remains tacit knowledge. We manage through vague understandings and stories that happen in our heads.

If our work is not visible, we miss much of its depth. Our brains can't grasp how our projects are unfolding. Nuances or even gross metrics go unchecked until it is too late.

Perhaps we should actually see our work.

Figure 1 — A map of greater Seattle. (Source: Google Maps.)

THE ANATOMY OF A KANBAN BOARD

The goal of a kanban board is to see work and gain insights into how to make work better. To achieve this goal, we need to ask the following questions:

- What is our current value stream (how does our work flow)?
- What types of work do we currently have?
- Who is doing the work?
- What does a complete task look like?
- What do we want to prove with our kanban?

Whether this board is for an individual, a group, or an organization, we need to ask these questions early and often. Kanban allows us to move at the true speed of our ability to produce; therefore, we do not need to wait for arbitrarily spaced retrospectives to improve the board. At each stand-up meeting, team members should be asking themselves how the board can be improved.

Structure

> I've never drawn the same kanban twice.
>
> — Corey Ladas, author of *Scrumban* and Kanban pioneer

I've traveled the world helping teams optimize their kanban boards. Many may start out the same, but few remain that way. Every team, every project, and every company has its own unique optimization of workflow. Optimization changes as conditions change. Therefore, the structure outlined here is generic and should be taken as such. The goal here is not to manage work — it's to manage *your* work.

This is important: if you want to make real decisions from your kanban, it needs to truly reflect what is happening to you.

The Value Stream

The value stream is the path through which work will flow. In order to provide you with information with which to make decisions, it needs to accurately reflect your true work — warts and all. When we draw value streams with clients, the initial drawing of the value stream takes minutes. Arguing over what *really* happens takes days.

Work Items

Your intents, projects, features, user stories, tasks, and so on will be the "work" that flows through your system. The granularity of this information dictates how quickly tickets move. If your board granularity is too large, metrics will be anemic. If your granularity is too small, you'll constantly be moving tickets and have no time to work. Sometimes finding the sweet spot requires some experimentation.

Workflow

Observe how work moves through the system you're building. Most work should flow fairly linearly through your value stream. However, you will witness some work items exhibiting strange behaviors. They might spawn defects, get stuck in editing loops, or become bogged down by bureaucracy. These nonconformant tasks provide vital information. You need to find out if their variation from expectations is caused by your system or by the nature of the tasks themselves.

These tasks may truly exhibit these behaviors, in which case they are not suffering from variation, they just have their own unique workflow. You can alter the board to suit their behavior; for example, giving them their own swim lane with a unique value stream.

On the other hand, some tasks may be suffering from variation actually caused by your system. For example, you might be funneling some work through a specific team member who becomes a bottleneck. You can improve your systems to normalize the behavior of systemic issues — in this case, you could funnel that work to multiple team members and alleviate the bottleneck.

Limiting WIP

This topic is deep enough that my coauthor Tonianne DeMaria Barry and I wrote an entire book about it.[1] We tend to overload our people, our teams, and our companies with work. There are so many potential rewards that we have trouble limiting our work to what our system can reasonably process. Your kanban *must* have work in progress (WIP) limits. Otherwise, it's just a Scrum board and will only show you how you are failing.

Decision-Making System

Decisions come from observable systems, and systems require healthy constraints to promote healthy operations. The value stream constrains the number of directions in which your work can conceivably flow. The WIP limits constrain the amount of work you put into your system. The results of this are manifold. Below is a short list of these results, how they function, and their impacts on decision making:

- **Flow.** WIP limits create a regular movement of tickets (you have to finish something to start something else).
  - *Function.* Flow allows you to measure normal completion times and to see how work is handed off,

where external resources are engaged, and other aspects of completion and process.

  - *Impact.* Decisions benefit from copious real-time, historic, and contextual information that is less prone to interpretation errors due to holes in individual understanding.

- **Laboratory.** The system invites not just interaction, but observation.

  - *Function.* Observable systems allow you to make decisions based not just on numeric evidence, but on pattern recognition and anomalies.

  - *Impact.* Decisions are now made as issues arise.

- **Socialization.** System governance and direction become a shared (social) function.

  - *Function.* The value stream and definitions of work are now explicit, updated, and shared by the group. Understanding is likewise shared, leading to fewer gaps or overlaps in effort and greater collaboration.

  - *Impact.* Decision making is greatly aided by multiple informed participants in the process. Individual necks leave the chopping block.

- **Transparency.** Work in all states is common knowledge.

  - *Function.* The kanban shows work, who is doing it, what is done, what is anticipated, what work is imperative, what work is optional, and so forth. Work is shown in a framework that rewards completion, meaning that it is always interpreted and scheduled according to value.

  - *Impact.* Political issues, hidden work, fiefdoms, and other common cultural anti-patterns decrease. Previous decisions required to deal with the anti-patterns abate, leaving increased capacity for more value-added decision making. Decisions no longer require lengthy meetings to provide status or alignment. When decisions need to be made, participants already have and understand that information because it is visible on the kanban.

- **Focus.** Limited WIP allows individuals, the team, and the organization to focus on work being done.

  - *Function.* Focus is the opposite of distraction. Being able to focus and flow gives you more insight into issues when they arise and provides the clarity of mind to resolve them quickly.

  - *Impact.* Decisions are directed toward completion and quality. When emergencies arise, teams are not overloaded and can focus on making real-time decisions to resolve the crisis.

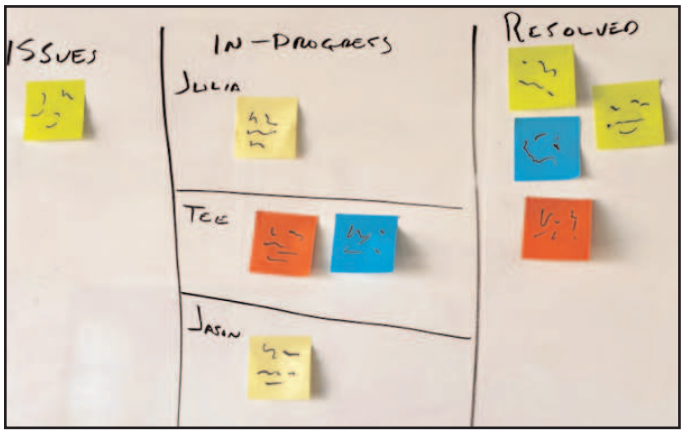


Figure 2 — A Personal Kanban board belonging to a group of middle managers at an Australian bank.

The interaction of all these elements creates a system designed to achieve a state of continuous improvement, which is akin to continuous decision making. You want your kanban to be a decision-making tool. It should show you which decisions to make and give you data to help make them.

THREE CASE STUDIES

You might still have some preconceived notions of what a kanban looks like and therefore limit how it might help you. So let's look at a few kanban or Personal Kanban[2] case studies to see the range of the tool and the work visualization it enables.

Meeting of the Mid-Managerial Minds

One shocking and brilliant group I personally witnessed was in an unlikely place: a 103-year-old bank in Australia. After a day of reviewing the work visualizations of this company (there were many), the last visit was to a group of middle managers who met weekly in front of a board. Their management Personal Kanban looked something like the one in Figure 2.

These managers were fairly siloed. Their work didn't necessarily impact the other managers. They were all in IT, but they had their own budget allotments and focuses. Some of these middle managers were in areas of technology that were being phased out. Others, like the mobile middle manager, had copious expansion on his plate. Their problems were different.

In almost every other company, these managers would be the generals of, if not warring, at least tensely bordered countries. They would guard their secrets and vie for funding.

Yet here, at this board, they would meet each week and talk about their problems. These were issues they needed to solve that could damage their ability to deliver. The issues would go on the board along with at least one action item for the week. Then, at the next meeting, the other middle managers would ask how it went.

These managers not only held each other accountable, they gave support and helped brainstorm solutions. When possible, they actually lent resources or provided connections within their respective departments to help solve their colleagues' problem.

In fact, this weekly meeting was so collegial and open that at one point an individual contributor on a team somewhere else in the company stopped in and gave a friendly, but clear, warning that an upcoming release was going to impact server performance. The middle managers reacted calmly and set up a time to have a cross-disciplinary meeting to deal with the issue.

The kanban visualization gave continuity to the meeting, provided a focal point that allowed a social system to evolve for usually isolated middle managers, and *rewarded* (!) participation. This means that at this bank, middle managers have peers who provide support, leadership, and guidance. Problems are discussed and dealt with. Solutions and decision making no longer take place in a vacuum, but with a diverse and supportive group.

See It to Believe It

One large financial services firm my colleagues and I worked with saw endless potential in what their IT department could create. They found so much potential, in fact, that they utterly overloaded IT with requests of highly urgent work. Every developer was working on four to eight projects — all of which were allegedly critical to the success of the company.

Each development team held a daily stand-up. Each team had delivery dates. And each person was on four to eight teams. That meant that, every day, people were going to multiple stand-ups, multiple planning meetings, and, after a while, multiple meetings to discuss why projects were behind schedule.

No one was getting work done on time because they were spending so much time discussing the work they weren't doing. Every project was important. People were staying late. Deadlines were made only under duress. Escaped defects were painfully numerous.

When I suggested that people focus on one project at a time, complete it, and move on to the next, there was no support for this in the organization. Stakeholders were convinced they'd never get any product at all, management didn't want to fight the political battles, and individual contributors had serious fears that their hard work would never see the light of day.

Everyone in the organization had become convinced that delivery was not something IT did.

The people in this IT group were dedicated, brilliant, and had deep domain knowledge. But they were suffering from *learned helplessness* — a condition in which people are exposed to failure and the inability to cure it for so long that they adopt the failure state as the status quo and make no efforts to improve it.

Each team had a very logical, clean kanban that looked something like the one in Figure 3. To highlight the impacts overwork was having on completion and quality, we simply started tracking the "ambient work" that people on each team had. Ambient work included all tasks being done on other projects or otherwise being undertaken by project staff. For each project, that looked something like the board shown in Figure 4.

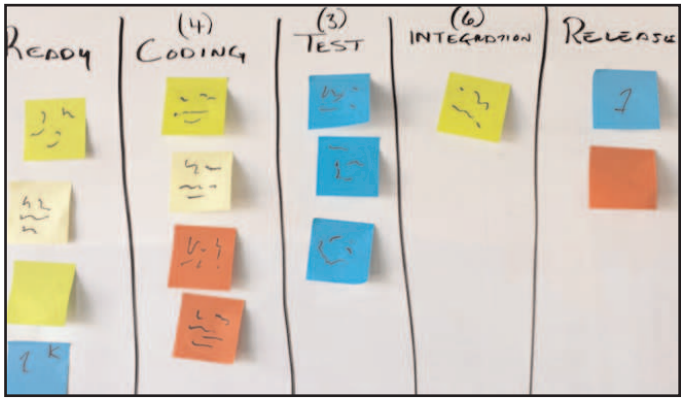


Figure 3 — One of the "very logical, clean" kanban boards at a large, multitasking financial services firm.

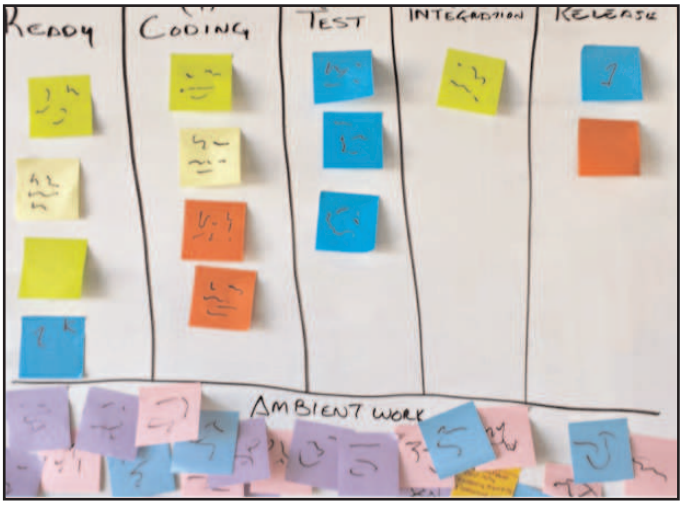


Figure 4 — The same kanban board with the "ambient work" displayed.

The obscene number of tickets along the bottom made everyone realize the real toll multiple projects had. Telling them this conceptually did not work. They needed an epiphany. Showing them visually made the case elegantly and quickly.

Decision making is greatly aided by visual systems because we can't ignore a huge physical artifact that is showing us a need for change or action. In this case, no one could possibly work on a project with several hundred Post-it Notes at the bottom of the board.

Proof Is in Completion

A midsized company in the midwestern US had a small group of speed coders. They were dedicated to taking small requests for added functionality and augmenting legacy systems. Before creating their kanban board, they used a ticketing system that hid upcoming work and allowed people proposing work to include anything at any time. There was no prioritization system, other than the priorities labeled by those who were requesting the work. Of course, everything was of utmost priority.

For important or insistent stakeholders, the team would start work and allow clients to take as long as they wanted to accept completed work. This meant that many projects were in flight, progress was slowed by constant calls asking "Where's my stuff?" and customers would take months to OK work or send it back for revision.

When the team adopted a kanban board, they were not only visualizing work for themselves, they were visualizing it for their customers. The new visualization became the system through which new requests were made. The team drastically limited their WIP.

The team also called all their customers and said, "We're adopting a new system and dumping the old one. If you want us to do something, please come up and put it on the board." Instantly, the group lost about 60% of the items in their backlog — the items had either aged out or were not actually important.

In the new system, new work requests are made at the team's morning stand-up meeting. The first few meetings were chaotic, but they quickly calmed down.

The team also pulls new work into the "Doing" column as a team. They have begun to swarm on each ticket, whereas before they would work as individuals. They have found that, for most tickets, their time to completion has gone from months to a few hours.

The team gave customers a deadline for acceptance testing, but soon that proved to be unnecessary because people are receiving the results of their requests in a few days rather than a few months. The completed work is still fresh, and stakeholder acceptance is much easier to achieve.

Decisions in this visualized and WIP-limited environment are made with the customer either at the time of request submittal or quickly thereafter. New work decisions are made by a team that also decides how to quickly and effectively complete the work. As noted above, the smoother flow of work means fewer decisions need to be made to remedy stalled or broken projects. The kanban simply will not tolerate such events. If a project is stalled or broken, it is immediately rectified or discarded.

WHAT THIS MEANS

With the kanban board, software development and IT teams have an unprecedented opportunity to show visually how projects are actually operating and make course corrections as necessary. Work and decisions about work happen in real time.

The board shows us project context. Political, financial, procedural, social, and managerial elements are all present, as are the relationships between them. This context enhances decision making about all aspects of a project, with a much deeper understanding of current and future state.

ENDNOTES

[1]Benson, Jim, with Tonianne DeMaria Barry. *Why Limit WIP: We Are Drowning in Work*. Modus Cooperandi Press, 2014.

[2]Benson, Jim, and Tonianne DeMaria Barry. *Personal Kanban: Mapping Work | Navigating Life*. Cooperandi Press, 2011.

Jim Benson, CEO of Modus Cooperandi (moduscooperandi.com), specializes in Lean project management and the management of knowledge work. He is the creator of Personal Kanban and, with Tonianne DeMaria Barry, coauthored the book Personal Kanban, *which won a Shingo Research Award for Excellence in 2012. He is the 2012 winner of the Brickell Key Award for excellence in Lean thinking.*

For the past two decades, Mr. Benson has worked at uncovering ways for groups to find clarity in unpredictable and amorphous knowledge work environments. Since starting Modus, he has helped the World Bank, NBC Universal, the United Nations, Spotify, Riot Games, Comcast, R.W. Baird, and others improve their kanban systems, implement collaborative solutions, identify and implement improvements, and create more innovative cultures. He can be reached at jim@moduscooperandi.com.

Decision Making: Logic or Luck of the Draw?

by Martin Bauer

As a project manager, I like to believe it's a skillful combination of logic, insight, and experience that makes my projects successful. At times that might be the case, but what this explanation fails to take into account is that I am — as are all project managers — susceptible to the errors in judgment, irrationality, and randomness that are a part of being human.

But who wants to admit that they have made irrational decisions, been biased, or, perhaps worse, been successful on a particular project through luck rather than skill? I certainly don't. Unfortunately, numerous studies on decision making make for chilling reading. They show that often we believe we are using logic to make a decision, when it's really an unconscious bias that's driving our choice.

When making decisions, there are three main areas we need to pay careful attention to:

1. Our human tendency toward irrationality
2. The impact of randomness
3. The power of intuition

OUR MINDS AT WORK: SYSTEM 1 AND SYSTEM 2 THINKING

To understand how we make decisions, it's important to understand how the mind works. Daniel Kahneman, psychologist and Nobel Prize winner in economics, argues that the mind has two modes of operation: System 1 and System 2 thinking.[1]

System 1 thinking is automatic and effortless, requiring little conscious effort. While this mode is quick to respond, there's a lot of complexity within System 1 thinking, some of which is unconscious. System 1 is unable to think statistically, though, which can lead us to irrational responses, illogical biases, and a lack of appreciation of the impact uncertainty and chance have on the world around us.

System 2 is very different; it's slow, deliberate, and considered. It requires effort. It's the part of our mind that allocates attention to complex calculations, and it is associated with choice and concentration.

While System 1 thinking can quickly create complex patterns of ideas, only System 2 can create ordered, logical steps. It can act as a gatekeeper for System 1, overruling impulses that aren't fully considered.

For example, if I show you a picture of a smiling baby and ask what mood the baby is in, you'd be able to answer instantly, without even thinking about it. That's System 1 thinking.

The underlying problem is that we believe we are more logical than we really are.

If I ask you what 27 x 43 is, unless you're a math whiz, you'd probably have to think about it for a while before giving me an answer. It would take concentrated mental effort to work out the answer, and any distractions would make the task even harder.

The underlying problem is that we believe we are more logical than we really are, that System 2 is in control while, in reality, we mostly operate under System 1. We only call on System 2 when needed for complex, logical thought processes, as it takes a lot more effort — or to stop System 1 from doing something we'd regret. For example, if someone accidentally steps on your toes, the impulse of System 1 might be to shout obscenities at the offender. This is where System 2 can keep System 1 in check, preventing you from screaming at a random stranger for what was a simple accident.

Because we mainly operate under System 1, we are far more vulnerable to inherent biases that lead to illogical or irrational decisions than we want to believe. It's worse for project managers, because we are called upon to make decisions all the time, and we may use System 1 thinking when it's System 2 thinking that's needed.

IRRATIONALITY REARS ITS BIASED HEAD

No project manager would deliberately make an irrational decision. The issue arises when we use System 1

thinking and mistakenly believe we are making a rational decision when in fact it's a biased one. The following examples are just a few of the unconscious biases that can potentially lead to irrational decisions.

Risk Aversion

People have a tendency to avoid risk, as was described by Swiss mathematician Daniel Bernoulli[2] in 1738. Bernoulli's view was that people don't evaluate options by their monetary outcomes, but rather by the expectation of the subjective values of the outcomes.

Imagine you're managing a project that's currently on track. One of your developers tells you she's found a new technology that has a 60% chance of reducing the build time for a feature from 10 to five weeks, but she won't know if it will work until she's spent two weeks evaluating the technology. The options are:

- Invest two weeks for a 60% chance of saving of five weeks.
- Stick to the original plan of 10 weeks.

It's no longer about logic; it's about how you feel about gains and losses.

My natural instinct (based on System 1 thinking) would be to stick to the original plan. As nice as saving time might be, I wouldn't want to risk investing in the new technology to find out it doesn't work and put the project behind by two weeks.

Let's now say the same project is already a month behind schedule. The same developer tells you about the new technology and a 60% chance of saving five weeks. The options are:

- Take a 60% risk to gain five weeks.
- Stick with the original plan, currently four weeks behind.

Since the project is already behind schedule, I'd be tempted to take a risk on the new technology, as it could get the project back on track, even though it could make things worse if it doesn't work out.

The two scenarios have the same potential loss or gain. In the first scenario, most people would be risk-averse and avoid the potential loss. In the second scenario, because there's already a loss, most people would take the risk to get the potential gain. It's no longer about logic; it's about how you feel about gains and losses. Even the framing of the options can sway the decision one way or another.

In project management, we often have to choose between options our teams present to us that have different levels of risk. Knowing that by nature we are risk-averse when there's a potential gain and risk-taking when there's a known loss can help us to think twice before making a decision one way or another.

Anchoring

Another common form of irrationality that can have a significant impact is anchoring. Every project manager knows that once an estimate has been uttered out loud, it's difficult to shift that number from the client's mind. A wise project manager will avoid giving any estimate without ensuring it's well informed. However, we all know the feeling of being put on the spot and being asked to provide a "ballpark" figure that the client promises we won't be held to. The problem is that once the anchor has been set, its effect is difficult to reverse.

Anchoring applies in almost every field where numbers are used. Dan Ariely, a professor of psychology and behavioral economics at Duke University, illustrated the impact of anchoring when he asked a group of his students to bid on some items.[3] Before the bidding started, the students were asked to write down the last two digits of their Social Security number (SSN) on the top right corner of the bidding sheet. After the bidding was done, the sheets were collected, the results correlated, and the winning bidders announced.

When the students were asked if writing down the last two digits of their SSN had any influence on their bids, the answer was categorically no. However, the results told a different story. Students with SSNs ending in 80-99 bid on average between 216% and 346% more than students with SSNs ending in 0-19.

In project management, we deal with numbers all the time, whether they be dates, estimates, percentages, costs, or what have you. And we rely on these numbers to inform the decisions we make. But how often do we consider the effect of anchoring and how it can unconsciously affect choices?

The Influence of Mood

Our moods can affect our decisions as well as the people around us whether we are conscious of them or not. Another experiment Ariely conducted[4] illustrates how much mood can impact decision making.

In the experiment, Ariely wanted to see if individuals could predict whether their mood would affect their decisions. A number of students were asked a series of questions on how they would behave or act in different states of sexual arousal. All of the students, prior to participating in the study, believed they wouldn't change their answers regardless of their state of arousal. When the study was completed, the results showed the students massively underestimated their actual responses during an aroused state compared to how they predicted they would react.

To quote Ariely, "In every case, our bright young participants answered the questions very differently when they were aroused from when they were in a 'cold' state.… When aroused, they predicted that their desire to engage in a variety of somewhat odd sexual activities would be nearly twice as high as (72% higher than) they predicted when they were in a cold state."[5]

While arousal is an extreme example, Ariely points out that we can assume the same of other emotional states such as anger, fear, hunger, and jealousy.

What does this mean for project managers when making decisions? I know from the feedback of people I've worked with that when I'm in a bad mood, I'm far less likely to listen to suggestions from my team; I will fail to give them due consideration and reject options that I think are risky. When I'm in a good mood, I'm more likely to be open to suggestions, take on other people's points of view, and worry less. The problem is that I'm not always conscious of the impact of my mood on my decision making. Like the students in Ariely's experiment, I'd be likely to deny that my emotional state would have any effect on my decision making, when in reality I'm no different to anyone else.

It's important to acknowledge that, whether we like it or not, our emotional state will have an influence on our decision making. We may believe that we'll always act in a calm, considered manner, but the evidence shows otherwise. If we suspect our mood could be influencing us, whether positively or negatively, it's a sign to take a step back and wait until we are in a calm state before making that decision.

Honesty

At times when I'm talking to developers and clients, I suspect I'm not always getting the full picture. I was brought up to believe honesty is the best policy, yet there are also instances when I decide to keep certain aspects of a project to myself. I justify these decisions by asking myself if the other party "needs to know" something. I don't lie — there is a line I won't cross — but sometimes there are details that have led me to a particular decision that I don't reveal.

These small acts of deception are more common than we think. Ariely has conducted numerous studies of cheating and dishonesty that show people will often embellish their statements rather than being outright dishonest. They will cheat, but only to a certain degree — often estimated at about 10%.

It's an unfortunate reality that project managers — who have to rely on the views, estimates, and answers of people we work with to make decisions — must also make practical allowances for cheating and exaggeration.

Are We All Irrational?

In the view of standard neoclassical economics, human decisions are rational. We make the effort to be fully informed and understand the benefits a particular decision or choice will deliver.

Behavioral economists view things differently. As Ariely puts it, "People are susceptible to irrelevant influences from their immediate environment, irrelevant emotions, short-sightedness, and other forms of irrationality."[6]

This applies to all of us. The good news is that awareness gives us the opportunity to avoid falling into the obvious traps and hopefully forces us to put System 2 thinking into action, thereby enabling us to see through the flaws in thinking, the distractions, and the impact of emotional states — and through that, to make better decisions.

RANDOMNESS TAKES ITS CHANCES

Things happen, sometimes when we least expect them; no amount of foresight will let us predict an unexpected event. Knowing this, I put a bit of buffer into any estimate or timeline that I provide. I do this mainly to account for errors made by the people providing the information I'm relying on. Yet what I rarely take into account is the effect of randomness.

I'm not alone in this. According to physicist Leonard Mlodinow,[7] we routinely misjudge the role of chance in our lives, with the unfortunate result that we end up making decisions that go against our best interests. There are two specific ways in which this can happen:

1. We rely on expert opinions because of an expert's good track record.
2. We assume someone's previous run of success is purely due to skill.

In the world of financial investment, we naively assume that if particular investors have a good track record, then they will continue to predict accurately, and thus we are likely to follow their advice. As Mlodinow states, there's a long tradition of guru analysts who get paid handsomely for their advice, while there is much evidence that the performance of stocks is random.[8] Another example is a study conducted in 1995 showing that eight of the highest-paid Wall Street superstars merely matched the market.[9]

We want to believe that a previous pattern of success is evidence of future performance, yet time and again, case studies have proven this not to be true, and not just in the financial market. In the world of project management, a particular project manager may have the good fortune of having successfully delivered several projects on time and on budget. The risk here is that the individual project manager may start to believe the success he has experienced is predominantly due to his own skill, which can lead to overconfidence, one of the hallmarks of System 1 thinking. As Kahneman points out, "Overconfidence is fed by the illusory certainty of hindsight."[10]

For project managers, relying on the advice of an expert or a personal run of success can fool us into believing that there's a pattern that will continue, when in fact it may be a random streak of good luck rather than skill. Basing decisions on previous success can easily lead us astray, just as following the advice of a Wall Street superstar.

It's not surprising that randomness is not something we understand or handle well. According to Mlodinow, "Many studies point to a close connection between the parts of our brain that make assessments of chance situations and those that handle the human characteristic that is often considered our prime source of irrationality — our emotions."[11] What is difficult to comprehend, he continues, is "how much of what happens to us — success in our careers, in our investments, in our life decisions, both major and minor — is as much the result of random factors as the result of skill, preparedness, and hard work."[12]

It shouldn't be difficult to understand that randomness can and does have a significant impact on projects. The question is, how can project managers take that into account in their decision making? If there's one lesson project managers can learn from Mlodinow's work, it is the need to be wary of relying on the past to predict the future. Don't assume that making the same decision will achieve the same result. While we can't help learning from our experiences, we should nevertheless consider each project as unique and the decisions made to be those uniquely suited to that project.

Illusions of Control

Logically, if events are random, then we can't be fully in control, and what we do may not make any difference at all. As a project manager, I find that a very difficult concept to accept. I'm not alone in this conundrum.

According to psychologist Ellen Langer, "While people may pay lip service to the concept of chance, they behave as though chance events are subject to control."[13] Langer has shown repeatedly through experiments that our need for a sense of control interferes with the accurate perception of random events. For example, subjects were more confident of success when playing a card game (which was determined purely by chance) if their rival was awkward and nervous.

What's worse is that when we falsely believe we have control over a situation, we will look for evidence to support our beliefs and rarely look for evidence that would prove otherwise, a phenomenon psychologists call "confirmation bias." We may even mistake random patterns as further proof if they align with our beliefs. We fool ourselves into believing we are in control, as the alternative is not something we are ready, willing, or able to accept.

It would be impossible to take randomness into account in every decision we make while managing a project, but that doesn't mean we should ignore it altogether. The mindset I adopt in decision making is to hope but not assume each decision I've made will pan out as expected. I'll often think about what I call "Plan B" and ask my team, "What happens if [insert random event]?"

There are two things that project managers should take from this discussion of the impact of randomness. The first is to always be ready to adapt, improvise, and make quick decisions when a random event occurs. The second is to never assume the decisions you make are the only factors that lead to success.

INTUITION

While we are human and prone to err, we also have an intelligent unconscious that we rely on to help make intelligent decisions without complex consideration. We call this intuition.

How Does Intuition Work?

According to German psychologist Gerd Gigerenzer, there are four elements of intuition:[14]

1. Rules of thumb produce gut feelings.

2. Gut feelings are what we experience.

3. **Evolved capacities** are the basis of rules of thumb.
4. **Environmental structures** dictate how well a rule of thumb will work.

When we have a strong feeling that's based on a rule of thumb formed from an evolved capacity, it can be exceptionally powerful. The key is knowing when to trust that gut feeling.

As a project manager, I have many rules of thumb that I rely on. If I'm working with a team I've worked with before, I already know how much buffer to put on estimates from particular team members and know whom I can rely on. When I meet a new client, depending on how they react to particular questions or suggestions, I'll get a sense of how easy or difficult a project will be.

Rules of Thumb

It may seem counterintuitive, but relying on rules of thumb can often lead to better results than having more information to hand. It's been shown in many environments. Gigerenzer tells the story of Dan Horan, a police officer at the Los Angeles airport, who is often able to successfully spot a drug courier without being able to articulate exactly what tipped him off. The same applies to many experts; they are successful in their field due to their intuition but are often unable to articulate in detail how their intuition enables them to reach the correct decision.

Gut Feelings

In order to know when to rely on a gut feeling, we need to know it is more than just a lucky guess.

The hallmarks of a gut feeling are:

- It comes to mind quickly with little effort.
- We are not fully aware of the underlying reasons at the time it surfaces.
- It's strong enough for us to act upon.

Following a gut feeling can seem too simplistic an approach in a complex discipline such as project management. Knowing all the facts should theoretically give project managers a greater chance at making the best decision. It turns out that's not necessarily the case.

Gigerenzer illustrates this through a decision a father has to make regarding which of two schools his son should attend. The father, Simon, gathers as much information as possible about each school (e.g., dropout rates, attendance rates, writing scores, social science test scores) and quickly develops a gut feeling that one school is better. Simon uses his previous experience to rate the factors and then picks the school that does better in what he views as the most important factor, attendance rate. This approach is called "Take the Best" heuristic.[15]

To confirm Simon's decision, Gigerenzer took the complex approach of analyzing each factor and weighing them, after which he came to the same conclusion Simon did. Simon's approach of basing his decision on a single factor, based on his intuition, was more effective (insofar as it came to the same conclusion with less effort) than a complex calculation.

In order to know when to rely on a gut feeling, we need to know it is more than just a lucky guess.

Another example comes from Malcolm Gladwell's book *Blink*, which discusses work done by John Gottman on predicting the success of marriages. Gladwell writes, "To make an accurate prediction about something as serious as marriage — indeed, to make a prediction of any sort — it seems that we would have to gather a lot of information and in as many different contexts as possible."[16] However, Gottman shows that this is not the case. He is able to eavesdrop on a couple's conversation in a restaurant and make an assessment of their marital stability in just a few minutes using what he calls "The Four Horseman":[17] defensiveness, stonewalling, criticism, and contempt. Of these, Gottman says contempt is the most important factor in predicting divorce. In the same way that Simon used a single factor (attendance rate) to select a school for his son, Gottman can assess the health of a marriage using a single factor (contempt).

Gigerenzer points to a number of reasons why less information can lead to better decisions, such as:

- Too many options can make it harder to make a decision.
- Our brains have inbuilt mechanisms to protect us from too much information.
- In an uncertain world, simple rules of thumb can predict complex phenomena as well as or better than complex rules.
- Too much information can be counterproductive.

In each of these situations, Gigerenzer argues that regardless of whether it's an expert or lay person involved, additional time, information, and choices would not guarantee a better decision, and the time

and effort taken could lead to a worse decision than following one's gut feeling.

The concept of using intuition as a basis for decision making may appear to support relying on System 1 thinking over System 2 thinking. Intuition, however, is much more than System 1 thinking. It takes time, effort, and experience to develop the evolved capacities, rules of thumb, and gut feelings that make intuition work — and that make it a superior method for decision making.

The next time you are faced with making a decision, consider whether taking the time to gather all the information available is going to lead to a better decision than relying on your intuition. In many cases, it won't.

NO SIMPLE ANSWER

As project managers, the decisions we make can, and will, have an impact on the outcome of our projects (even taking into account the effect of randomness). Therefore, it's our responsibility to take care that our decisions are considered and will offer the greatest chance of success for our projects.

There is no simple answer to decision making in project management. It comes down to striking the right balance among exercising logic, avoiding the biases of System 1 thinking, leveraging intuition, and sometimes just being lucky.

ENDNOTES

[1]Kahneman, Daniel. *Thinking, Fast and Slow*. Farrar, Straus and Giroux, 2011.

[2]Bernoulli, Daniel. *Hydrodynamica*, 1738.

[3]Ariely, Dan. *Predictably Irrational*. HarperCollins, 2008.

[4]Ariely (see 3).

[5]Ariely (see 3).

[6]Ariely (see 3).

[7]Mlodinow, Leonard. *The Drunkard's Walk: How Randomness Rules Our Lives*. Pantheon, 2008.

[8]Malkiel, Burton G. *A Random Walk Down Wall Street*. W.W. Norton & Company, 1973.

[9]Desai, Hemang, and Prem C Jain. "An Analysis of the Recommendations of the 'Superstar' Money Managers at Barron's Annual Roundtable." *Journal of Finance*, Vol. 50, No. 4, September 1995.

[10]Kahneman (see 1).

[11]Mlodinow (see 7).

[12]Mlodinow (see 7).

[13]Langer, Ellen J. "The Illusion of Control." *Journal of Personality and Social Psychology*, Vol. 32, No. 2, August 1975.

[14]Gigerenzer, Gerd. *Gut Feelings: The Intelligence of the Unconscious*. Penguin, 2007.

[15]Gigerenzer, Gerd, and Daniel G. Goldstein. "Reasoning the Fast and Frugal Way: Models of Bounded Rationality." *Psychological Review*, Vol. 103, No. 4, October 1996.

[16]Gladwell, Malcolm. *Blink: The Power of Thinking Without Thinking*. Little, Brown and Company, 2005.

[17]Gladwell (see 16).

Martin Bauer is the Program Manager for BigDataPartnership, London's leading consultancy for big data solutions. With over 15 years' experience in project management, Mr. Bauer is the first certified Feature-Driven Development project manager and an advocate of Agile development. He also is a qualified lawyer and has had extensive experience in implementing content management and digital solutions. He can be reached at martin@martinbauer.com.

The Role of Culture in Decision Making

by Sharon Glazer and Tamas Karpati

Decision making is an act of processing information related to a problem (or problems) and a situation (e.g., external demands and key stakeholders) in order to arrive at a judgment. The information to be processed is based on what is salient and objectively presented, as well as the context in which the information is extracted. Together, the salient information and contextual factors activate schemas[1] that guide how people think through the decision dilemma. The fact that researchers even study decision-making processes suggests that decision making can be controlled, that it is boundedly rational, and that people can learn to be more efficient and effective decision makers.[2] Most commonly, a boundedly rational economic model influences the decision-making process. Arriving at a decision requires the decision maker to weigh the risks and benefits of various options and derive a decision that compares potential losses against potential gains.[3]

For the most part, people in the West tend to think of decision making as a linear process that takes the decision maker from a point of problem perception, identification, and formulation, through to actions that include searching for and evaluating alternatives, and finally to making the best choice from among those alternatives given the information available.[4] This view is quite appealing to IT professionals, who have been trained to methodically plan, design, develop, test, and maintain complex systems following a well-established structured pattern. However, decision making is actually not so clear-cut. Numerous factors, including the availability of choices, the extent of the decision maker's accountability, relationships among stakeholders (e.g., who is affected by the decision, how important the decision is to a person's reputation), recognition of familiar patterns, and how people construct the narrative (i.e., explain a situation to themselves), are all consciously or unconsciously considered.[5-7] Moreover, cultural context shapes the degree to which these additional factors affect the decisions made, whether or not a person acknowledges that culture plays a role in decision making. Together, such factors influence how people make sense of events.

SENSEMAKING

Sensemaking is a process in which a person strives to understand and give meaning to experiences.[8] A person's past experiences, the extent to which he identifies with the event, and cultural values all influence the meaning he imposes on a situation.[9] In an organizational context, an individual makes sense of events on the basis of organizational goals; the person's position, tenure, and education; expectations that others have of the decision maker; past communications with others in the organizational setting; observations of the consequences of others' decisions; and how other decision makers make decisions. Decision makers also attend to that which is *not stated*, and cultural context often dictates the meaning of what is not said. By identifying both what is addressed and what is not, it is possible to infer a culture, including an organization's culture.

For example, it is easy to detect when an organization has a low tolerance for ambiguity, because people at all levels will be asking many questions or discussing potential alternative choices before coming to a decision. The challenge lies in identifying the cultural attribute when no questions are asked, particularly if discourse is through computer-mediated communication. Is it a sign of high tolerance for ambiguity? IT professionals may have experienced this type of challenge when interacting with their counterparts in other countries or foreign nationals within their own company. It's difficult to know whether these counterparts simply tolerate ambiguity, the situation is not at all ambiguous for them, or they simply don't ask questions when others are in the vicinity. Perhaps they prefer to ask for clarification individually so as not to cause either party to lose face.

WHAT IS CULTURE?

Culture is a catchall term that has different meanings for different people. For the purposes of this article, culture refers to the character of a group of people who share a common history and perception of appropriate normative behaviors, values, and beliefs. The shared

features of culture are passed down from one generation to the next via the structures and systems people in the culture have created. Numerous entities have cultures, including nations, societies, organizations, gender/sex groups, families, departments, and so on. This article specifically considers national cultures and focuses on these cultures' values and beliefs.

Like values, a culture's social axioms provide a foundation for understanding the underlying assumptions that guide people's behaviors, feelings, and interpretations of events.

A nation's cultural values represent desired principles that guide individuals' behaviors, feelings, and thinking. They explain why we observe artifacts (e.g., organizational processes) or experience events (e.g., someone's late arrival to a meeting — disrespectful, no big deal, or a sign of authority?) as we do. Like values, a culture's social axioms — that is, high-level abstractions of generalized beliefs people hold about the way people interact with each other or with things around them[10] — provide a foundation for understanding the underlying assumptions that guide people's behaviors, feelings, and interpretations of events. Social axioms represent what people believe to be causal or correlational truths (e.g., "Good things come to those who wait") and help people interact with their environment (e.g., protecting an historic building through a silent sit-in) and other people (e.g., not speaking in a meeting until you are called upon). Both cultural values and social axioms are likely to shape what people attend to when gathering information about a situation that requires a decision, how they interpret the information, and the kinds of explanations people give to justify their decisions.

Cultural Values

Hofstede's Framework

Dutch social psychologist (and former IBM employee) Geert Hofstede's[11] seminal work on cultural values presents five cultural values, which he derived from survey responses of over 100,000 IBM employees across more than 40 nations.[12] They are:

1. **Individualism vs. collectivism.** An individualistic culture emphasizes the individual's uniqueness in relation to the social group. The individual is rewarded for taking "me time" and having freedom of choice. In contrast, a collectivist culture emphasizes that group needs supersede the needs of any individual and that each individual is an integral part of the group. Such cultures reward interdependence and group actions.
2. **Power distance (PD).** High-PD cultures reinforce strict hierarchy-based relationships between subordinates and supervisors, such that supervisors are ultimately and solely responsible for making decisions. Low-PD cultures prefer to view people as equally important contributors, and decision makers consider the information they hold to be as important as that of any other person.
3. **Masculinity vs. femininity.** Masculine cultures emphasize achievement and wealth, resolution of conflict through force, and distinct roles for men and women. They often view leaders as the most important decision makers in a work situation. In contrast, feminine cultures emphasize environmental welfare, egalitarianism, and nurturing, developing, and maintaining social networks. They favor group decision making through open dialogue and consensus building.
4. **Uncertainty avoidance (UA).** High-UA cultures emphasize the use of rules, structures, policies, and normative practices to govern work processes. Low-UA cultures are more tolerant of ambiguity and open to creativity, and people may be less "stressed" at work.
5. **Long-term vs. short-term orientation.** Long-term-oriented cultures believe that it is important to plan and save for the future. Short-term-oriented cultures reinforce immediate gratification and live for the moment.

Schwartz's Framework

Another cultural framework that has received growing attention is the cultural values derived by Hebrew University social psychologist Shalom Schwartz,[13] based on a cross-cultural evaluation of teachers and college students' value priorities across over 65 cultural groups. Schwartz's cultural framework identifies seven cultural values:

1. **Intellectual autonomy.** Intellectual autonomous cultures emphasize independent efforts to fulfill desired goals, creativity in thoughts and actions, independent decision making, and contractual (vs. obligatory) relationships.
2. **Affective autonomy.** Affective autonomous cultures reinforce a person's control over changing the status quo and pursuing exciting experiences.
3. **Conservatism.** Conservative cultures place importance on maintaining the status quo, preserving modesty, and fulfilling role expectations, including

maintaining the traditional order among people. These cultures view people as mutually obligated, and thus decision makers will strive toward decisions that benefit the group, as the group (not the individual) is the salient stakeholder. If a decision maker does not consider the implications of decisions for the group, then order is disrupted, which could cause the decision maker to lose face.

4. **Harmony.** Harmonious cultures emphasize cooperative relationships and fitting in with the environment. For this reason, decision makers tend to make decisions that maintain harmony as much as possible.
5. **Mastery.** Mastery cultures emphasize control over situations, the environment, and others. These cultures encourage dominance; decision makers are supposed to be in control and are thus solely responsible for being agents of change. Consultation with others will often be seen as a sign of weakness in these cultures.
6. **Egalitarianism.** Egalitarian cultures emphasize equality and opportunities for all people. Decision makers will consider how their decisions affect the welfare of others.
7. **Hierarchy.** Like high-PD cultures, hierarchical cultures emphasize status differences and respect for people in authority roles. Emphasis is placed on differentiation of power, roles, and resources. Decision makers in hierarchical cultures are ultimately responsible for decisions. When a culture is both mastery- and hierarchy-oriented, there is little concern over the impact of decisions on other people. When a culture is both conservative and hierarchical, decision makers are encouraged to make decisions for the perceived benefit of the whole group.

It is important to highlight here that no country reinforces only one of these cultural values. Like a person's personality profile, cultures have cultural profiles. Thus, even if the US and France rank high on individualism, they are still quite different with respect to other cultural values, thus creating their own unique cultural character. Table 1 presents the cultural values identified by Hofstede and Schwartz, practices that indicate where each cultural value is prominent, countries in which the various values dominate, and how the different values influence how managers are expected to behave.

Social Axioms

Just as mathematical axioms serve as starting points for reasoning, social axioms "are basic premises that people endorse and use to guide their behavior in daily living."[14] Knowing that a culture endorses hierarchy (as opposed to egalitarianism) could explain why a person's title is important, and this knowledge would guide proper etiquette in intercultural interactions. For example, in a hierarchical culture, it would be important to refer to someone using their formal title (e.g., Dr. Wallace) rather than by an informal use of their given name (e.g., Sam), a practice that would likely be observed in an egalitarian culture. An understanding of social axioms is helpful in training managers to navigate cross-cultural boundaries with greater ease.

APPLYING CULTURE IN DECISION MAKING

Researchers have revealed several cross-cultural differences in decision-making styles. For example, French managers, following Descartes's reasoning model and emphasis on intellectualism, may think through every possible alternative and try to anticipate the implications of decisions to near 100% certainty before coming to a decision. In contrast, Danish managers, much like US managers,[15] may make decisions based on a sampling of information coming from various sources, but within a specified timeline.[16] The Danish take a pragmatic, functional approach to decision making and evaluate alternative solutions according to the resources available to realize them. In contrast to both French (intellectual) and Danish (pragmatic) decision makers, Greek decision makers may take a more inductive approach to making a decision, with particular emphasis on an Aristotelian-influenced view of moral virtues (i.e., making the right decision for the right reason and sticking with it).[17] German decision makers may be rational, too, but they also rely on their status in an organization's hierarchy to guide decision making.[18] Hungarians take on an autocratic decision-making style, as evidenced by several speeches given by current Prime Minister Viktor Orbán, who reminded his people that they must put their trust in him to make decisions for the good of the country.[19] In China, subordinates likewise follow their superiors' formal authority and even prefer that final decisions be unambiguously made at the top.[20, 21]

While all these differences are helpful in recognizing various decision-making styles, they do not explain why the styles differ. Knowing the values and beliefs underlying the culture's preferred decision-making approach is necessary for successfully engaging in intercultural business interactions. For example, if you are an IT manager who wants to outsource work, it will be important to consider whether your project requires developers to toggle between multiple aspects of the project or to concentrate on one task at a time. If the former, then you should consider outsourcing to a country that is low on uncertainty avoidance and high

Table 1 — Cultural Values, How to Spot Them, Where They Occur, and How They Impact Managerial Decision Behaviors

Cultural Value (Hofstede/ *Schwartz*)	Example Indicators	Countries with High Scores on the Value[1-4]	Expected Managerial Behavior[5-6]
Individualism/ *Affective Autonomy*	A person is assigned a task and is solely responsible for its successful completion.	US Australia UK Netherlands	There is a task-oriented managerial style, with reliance on personal experiences. Bilateral decisions are common, as people with certain information will be consulted. Managers take control of situations and feel good about achieving goals.
Collectivism/ *Conservatism*	A group is assigned a task, and all take responsibility for its successful completion.	Guatemala Pakistan Indonesia Taiwan	There is a task- and person-oriented managerial style, with greater reliance on unwritten rules and colleagues. Consultative and consensus decision making is preferred.
High Power Distance/*Hierarchy*	A superior dictates down a chain of command the tasks that need to be completed, assigning them to groups or individuals.	Malaysia Philippines Mexico China	Superiors' guidance is sought; formal rules are not sought.
Low Power Distance/ *Egalitarianism*[7]	Supervisors and subordinates are equal contributors to developing solutions, and both would voice opinions. There is limited value to a chain of command.	Austria Israel Denmark New Zealand	Subordinates' input is sought. A manager is often a facilitator of a team interaction. A consultative management style is preferred.
Masculinity/ *Mastery*	There is a clear division of roles on a team, and each individual knows what is expected with regard to his or her contribution.	Japan Hungary Austria Venezuela	Reliance on one's own experience and explicit rules is typical. If one needs assistance, advice is sought from superiors and never subordinates.
Femininity/ *Egalitarianism*	Division of roles is "fuzzy," as all people are invited to participate in all aspects of developing solutions.	Sweden Norway Netherlands Denmark	Unwritten rules have some influence on managerial decisions.
High Uncertainty Avoidance	Managers will justify their decisions on the basis of clearly delineated written policies and procedures.	Greece Portugal Guatemala Uruguay	Managers will follow formal rules, procedures, and policies. They will not refer to their own experience or intuition, but to documented policies.
Low Uncertainty Avoidance/ *Intellectual Autonomy*	Brainstorming sessions or "free time" for creative thinking is desired. Organizations invest in resources to engage in extreme innovation (e.g., skunkworks projects).	Jamaica Denmark Hong Kong India	Managers take risks and engage in creative thinking to identify innovative solutions.
Long-Term Orientation	Traditionally, workers stay with their organization for life. Employers and employees protect each other under all circumstances.	China Hong Kong Taiwan Japan	Organizations plan for the long term. Managers will take the blame for a poor decision in order to save a younger, less experienced individual.
Short-Term Orientation	Companies traded on the stock market must work toward immediate fulfillment of investors' needs.	Sierra Leone Philippines Norway UK	Organizations aim for immediate solutions without considering long-term implications. An under-performing contributor will be dismissed from his or her job.
Harmony	Corporate social responsibility is a dominant feature. Public transportation and social welfare are emphasized, but so might be corruption in the form of protectionism for family and friends.	Slovenia Italy Estonia Finland	Managers will solicit advice from specialists and communicate decision choices with subordinates to gain buy-in. To protect relationship harmony, managers might hire family and friends.[8]

[1]Hofstede, Geert. *Culture's Consequences: International Differences in Work-Related Values*. Sage, 1980.

[2]"Long-Term Orientation." Clearly Cultural (www.clearlycultural.com/geert-hofstede-cultural-dimensions/long-term-orientation).

[3]Schwartz, Shalom H. "A Theory of Cultural Values and Some Implications for Work." *Applied Psychology: An International Review*, Vol. 48, No. 1, January 1999.

[4]Bond, Michael Harris, et al. "Culture-Level Dimensions of Social Axioms and Their Correlates Across 41 Cultures." *Journal of Cross-Cultural Psychology*, Vol. 35, No. 5, September 2004.

[5]University of Sussex Professor Peter Smith and colleagues addressed culture's influence on the type of guidance managers would seek and how that relates with managers' performance on work events. The hypotheses were only posed for the individualism-collectivism, power distance, masculinity-femininity, and uncertainty avoidance values; see: Smith, Peter B., Mark F. Peterson, and Stephanie J. Thomason. "National Culture as a Moderator of the Relationship Between Managers' Use of Guidance Sources and How Well Work Events Are Handled." *Journal of Cross-Cultural Psychology*, Vol. 42, No. 6, August 2011.

[6]Smith, Peter B., Mark F. Peterson, and Shalom H. Schwartz. "Cultural Values, Sources of Guidance, and Their Relevance to Managerial Behavior: A 47-Nation Study." *Journal of Cross-Cultural Psychology*, Vol. 33, No. 2, March 2002.

[7]Egalitarianism positively correlates with both low power distance and femininity, as discussed in Smith et al. (see 5).

[8]Smith et al. (see 5).

on intellectual autonomy, because these cultures are open to change and stimulation. In contrast, if the latter approach is taken, you should consider outsourcing to a country that values conservatism and mastery, because these cultures reinforce maintaining balance and control.

Most cross-cultural research on decision making has focused on the individualism-collectivism values to explain cultural differences in decision-making processes. These studies have shown that collectivistic cultures encourage cooperation and manage conflict by ensuring that everyone has a chance to voice his or her opinion. People in these cultures tend to be respectful and open to discussing diverse views as a way of enabling the manager to reach a decision.[22] Furthermore, among negotiators from collectivistic societies, being held mutually accountable influences greater cooperation among the negotiators. Among negotiators from individualistic cultures, however, a competitive approach to negotiations becomes prominent.[23] That said, the individualism-collectivism values alone do not sufficiently explain why certain decisions are made. It is not enough to say, "A culture is collectivistic, and therefore [fill in the blank]."

Decisions can best be understood when considering other cultural values as well. For example, in a simulated team negotiation situation, the desire to maintain harmony is one explanation for why a Taiwanese team failed to achieve its negotiation goals compared to a US team.[24] In individualistic cultures, decision making is ultimately not seen as integrative. A lead negotiator will enter into a negotiating situation prepared in advance to promote her organization's interests and to anticipate possible counterarguments. Arguments from the opposing team that do not fit the negotiator's schema for how team negotiations should occur will be rejected, and the negotiator will strive to fulfill the goal she originally set out to accomplish. In the US, we might refer to this phenomenon as "escalating commitment," a situation in which a negotiator will often take unilateral decisions. In contrast, when in a team negotiating scenario, a Taiwanese decision maker will have a harder time achieving negotiating goals because he will consider teammates' perspectives and look to reach consensus in an effort to maintain harmony. Not that decision makers from individualistic cultures have it all figured out, of course. Because individualism reinforces independent goals, and individuals strive to differentiate from others, decision makers may be "closed-minded … and ineffective."[25]

Let's consider another example. In the US, decision makers do not typically have large social networks to fall back on when taking risky decisions, and thus people are regularly encouraged to behave conservatively with financial matters. In fact, when financial institutions took large risks with other people's money, precipitating the financial crisis of 2008, those who suffered from the fallout were often left homeless. Because large social networks are more common in China, people tend to feel they have a safety net that will help out if they make a risky decision that turns out to be incorrect.[26] Chinese managers are more likely to report trust in others than US managers because, for them, both friendship or family links and economic support are tied together, whereas in the US, mixing family or friends with business is not as common.[27] In fact, adages such as "Money and friends don't mix" reveal beliefs that influence US managers' thinking about decisions they have to make (and influence laws to prevent nepotism). Still, it is important to remember that despite large social networks, China is a masculine and high-PD culture. Therefore, the extent to which risky decisions are made will be a function of a contributor's role in a hierarchy.

In a collectivistic and high-PD culture, there is a chance for dialogue to shut down. Yet when people from collectivistic cultures are perceived to be following the decision maker's judgment, it should not be assumed that it is blind following, but quite possibly an informed and consensual following after having already held cooperative dialogue about a situation. Keen observation regarding the relationships between people who work together will reveal whether the cooperative or the hierarchical aspects of collectivism are driving decision-making processes.

Unlike high-PD and collectivistic cultures, cultures that are low on UA, high on mastery, and high on intellectual autonomy values may be more open to innovative and creative ideas and thus make riskier decisions. Israel is an example of a nation with this cultural profile, which partly explains why Israel has the highest rate of new start-up companies per capita compared to other countries.[28] These cultural values reinforce Israel's focus on growth and novelty. The lesson here for the IT professional is that when working with Israelis, expect creative, out-of-the-box thinking and a fully engaged work ethic.

Understanding how cultural values and beliefs influence decision making enables IT professionals, who cross cultural boundaries, to shift their cultural lens to understand and interact with others more fluidly.

CULTURE IN THE MIND OF A PERSON

People attend to and frame their understanding of situations around previously experienced scenarios, and these understandings are shaped by culture.[29] Depending upon the frequency of certain kinds of experiences and how recently the experiences occurred, individuals will be able to access and retrieve relevant information to make sense of events.[30] Most events are coated in cultural signals, and thus different symbols, structures, interactions, or words can trigger different expectancies. In this way, cultural norms shape how individuals construct and impose meaning on a situation.[31, 32]

Through experiments, researchers have been able to cue people to access different networks of understanding, influencing their thinking from a different cultural lens. Cuing people to think from a different cultural lens is known as cultural priming. Cultural primes take the form of situational cues and cultural symbols (e.g., semantic or associative primes, such as "I" vs. "we" or the symbol of the Statue of Liberty, respectively) that influence people to frame their perception and interpretation of events. Most people are exposed to different kinds of experiences that cause their identities to shift, and thus most people are able to switch between cultural frames. For example, in a professional setting surrounded by a large group of people, a subordinate would refrain from giving her opinion, but behind closed doors with three to four people, she would voice her opinion readily without being asked to speak.

Cognitive research has consistently confirmed that priming changes how people respond to the same situation. For example, people from both individualistic and collectivistic cultures, when presented with symbolic or associative cultural primes reflecting collectivism (e.g., reading stories in which a general chose a family member vs. the most qualified person to be sent to the king; circling pronouns related to "we," "our," or "us" in a passage; viewing a picture of yin-yang; or viewing a picture that depicts group processes), tend to become more "collectivistic-minded," as evidenced by changes in their responses to the same test measures. (Likewise, primes reflecting individualism prompted study subjects to become more "individualistic-minded.") Recent neuropsychological studies are also demonstrating that cultural priming stimulates different neural pathways in the brain.[33] Together these types of studies provide evidence that culture influences our decisions and judgments. Moreover, because priming can modify people's cultural perspectives, it has the potential to aid managers in making better decisions by clearly delineating various cultural factors that must be considered when engaging in a decision-making process, particularly the host culture's dominant values and beliefs. For example, if cued on group cohesion and unity, a US decision maker may be prompted to ask for others' thoughts and deliberate on potential options before deriving a decision that is informed by other participants. Such an inclusive process would prompt the respect of his Japanese counterparts and reinforce a perception that the US decision maker is thinking about the betterment of the group.

SEEING BOTH SIDES

In a global setting, culture is an important facet of the decision-making process. To become a great decision maker, it behooves an individual to become educated about practices, values, and beliefs that are dominant in a culture and to understand others' frames of mind before making a decision. This recommendation inevitably suggests adopting an interdependent mindset. Ironically, by paying attention to a dominant cultural value or belief, the decision maker may learn she has to make decisions independently, without consulting others. Alternatively, the decision maker might learn that consulting with others is desired.

The point is to take cultural values and beliefs into consideration and to become more self-aware of the influence of one's own cultural values in approaching a decision dilemma. By understanding cultural values and beliefs, managers are a step closer to identifying, predicting, and shaping how they make decisions (whether unilaterally, bilaterally, through consensus, or consultation), as well as how people in the host environment in which they are operating will perceive their decisions.

ENDNOTES

[1]Weber, Elke U., and Michael W. Morris. "Culture and Judgment and Decision Making: The Constructivist Turn." *Perspectives on Psychological Science*, Vol. 5, No. 4, August 2010.

[2]Lipshitz, Raanan, Gary Klein, and John S. Carroll. "Introduction to the Special Issue — Naturalistic Decision Making and Organizational Decision Making: Exploring the Intersections." *Organization Studies*, Vol. 27, No. 7, July 2006.

[3]Tversky, Amos, and Daniel Kahneman. "Advances in Prospect Theory: Cumulative Representation of Uncertainty." *Journal of Risk and Uncertainty*, Vol. 5, No. 4, October 1992.

[4]Angie, Amanda D., et al. "The Influence of Discrete Emotions on Judgement and Decision-Making: A Meta-Analytic Review." *Cognition and Emotion*, Vol. 25, No. 8, December 2011.

[5]Angie et al. (see 4).

[6]Lipshitz et al. (see 2).

[7]Weber and Morris (see 1).

[8]Korotkov, David L. "The Sense of Coherence: Making Sense Out of Chaos. In *The Human Quest for Meaning: A Handbook of Psychological Research and Clinical Applications*, edited by Paul T.P. Wong and Prem S. Fry. Erlbaum, 1998.

[9]Osland, Joyce S., and Allan Bird. "Beyond Sophisticated Stereotyping: Cultural Sensemaking in Context." *Academy of Management Executive*, Vol. 14, No. 1, February 2000.

[10]Leung, Kwok, et al. "Social Axioms: The Search for Universal Dimensions of General Beliefs About How the World Functions." *Journal of Cross-Cultural Psychology*, Vol. 33, No. 3, May 2002.

[11]Hofstede, Geert. *Culture's Consequences: International Differences in Work-Related Values*. 2nd edition. Sage, 2001.

[12]As Hofstede's study was conducted in one organization (IBM), it holds many cultural variations constant, and naturally its definitions of cultural values reflect concepts prominent in workplace relationships.

[13]Schwartz, Shalom H. "A Theory of Cultural Values and Some Implications for Work." *Applied Psychology: An International Review*, Vol. 48, 1999, pp. 23-47.

[14]Bond, Michael Harris, et al. "Culture-Level Dimensions of Social Axioms and Their Correlates Across 41 Cultures." *Journal of Cross-Cultural Psychology*, Vol. 35, No. 5, September 2004.

[15]Nørreklit, Hanne, and Lennart Nørreklit. "Danish Versus US Management Control: The Ideological Dimension." Paper presented to the *18th Scandinavian Academy of Management (NFF) Meeting*, Aarhus, Denmark, August 2005.

[16]Schramm-Nielsen, Jette. "Cultural Dimensions of Decision-Making: Denmark and France Compared." *Journal of Managerial Psychology*, Vol. 16, No. 6, August 2001.

[17]Tzoanou, Marilena. "Values and Ethical Decisions at Work: An Aristotelian Study of Greek Managers." Doctoral dissertation, University of Central Lancashire, May 2013.

[18]Khairullah, Durriya H.Z., and Zahid Y. Khairullah. "Cultural Values and Decision-Making in China." *International Journal of Business, Humanities and Technology*, Vol. 3, No. 2, February 2013.

[19]"Prime Minister Viktor Orbán's Speech at the 25th Bálványos Summer Free University and Student Camp." Tusnádfürdo (Baile Tusnad), Romania, 26 July 2014.

[20]Lipshitz et al. (see 2).

[21]Ralston, David A., et al. "Differences in Managerial Values: A Study of US, Hong Kong, and PRC Managers." *Journal of International Business Studies*, Vol. 24, No. 2, 1993.

[22]Tjosvold, Dean, Peiguan Wu, and Yi Feng Chen. "The Effects of Collectivistic and Individualistic Values on Conflict and Decision Making: An Experiment in China." *Journal of Applied Social Psychology*, Vol. 40, No. 11, November 2010.

[23]Weber and Morris (see 1).

[24]Gelfand, Michele J., et al. "Toward a Culture-by-Context Perspective on Negotiation: Negotiating Teams in the United States and Taiwan." *Journal of Applied Psychology*, Vol. 98, No. 3, May 2013.

[25]Tjosvold et al. (see 22).

[26]Weber and Morris (see 1).

[27]Weber and Morris (see 1).

[28]Senor, Dan, and Saul Singer. *Start-Up Nation: The Story of Israel's Economic Miracle*. Twelve, Hachette Book Group, 2009.

[29]Weber and Morris (see 1).

[30]Oyserman, Daphna. "Culture as Situated Cognition: Cultural Mindsets, Cultural Fluency, and Meaning Making." *European Review of Social Psychology*, Vol. 22, No. 1, 2011.

[31]Oyserman (see 30).

[32]Weber and Morris (see 1).

[33]Glazer, Sharon, et al. "Priming of Relational Models and Intercultural Training." In *Handbook of Intercultural Relations Neuroscience*, edited by Jason E. Warnick and Dan Landis. Springer, forthcoming.

Sharon Glazer is a Professor and Chair of the Division of Applied Behavioral Sciences at the University of Baltimore and Adjunct Research Professor at the University of Maryland (Dept. of Psychology and Center for Advanced Study of Language). She is also the Editor for the International Journal of Stress Management*, Treasurer for the International Association for Cross-Cultural Psychology, and a member of the Advisory Board for the Institute for Cross-Cultural Management at Florida Institute of Technology. Under the auspices of an Erasmus Mundus third country scholar award, Dr. Glazer was a visiting professor to the University of Bologna and Rene Descartes University in Paris, France. She also taught at the University of Valencia, University of Barcelona, University of Victoria in Wellington, and was a Fulbright scholar at the Technical University of Budapest. Dr. Glazer's research revolves primarily around cross-cultural issues in organizational behavior, specifically occupational and organizational stress, leadership, global virtual teams, meaningfulness in life, social support, organizational commitment, values, and temporal orientation. Currently, she is leading a study of leadership and stress across cultures. Finally, Dr. Glazer has engaged in leadership consulting to such organizations as PricewaterhouseCoopers, Ameritech, the US Customs Service, and various US Department of Defense agencies. She can be reached at sglazer@ubalt.edu.*

Tamas Karpati is currently a Senior Associate of Technology Solutions at IMPAQ International, focusing on health IT research solutions from conception through implementation. Prior to that, Mr. Karpati worked in IT for 15 years, leading private industry projects in healthcare, finance, e-commerce, and various other sectors. His core competencies are in product and program management, business analysis, and international expansion. Mr. Karpati has managed several systems development efforts involving Web and mobile application development for clients such as eBay, AT&T, Blue Cross/Blue Shield, and Alere. He has a MEd from Xavier University, an MBA from San Jose State University, and a BS in economics from the Budapest University of Economic Studies. He can be reached at tamas@karpi.com.

The Science of the Art of Decision Making

by Sachin Mahajan

Decision making is something akin to breathing; we have done it and are doing it and have to do it every second of our life. Decision making ruled the first step we took, the school we went to, the courses we took, the career we got into, and the organizations we work for. Just as an individual's personal, social, and financial status is a sum total of the decisions taken by him- or herself and others, an organization's success, growth, market share, and so on are all linked to the accuracy of decisions made by the organization and how well those decisions stood the test of time.

When decision making is recognized as a critical skill, and organizations spend millions on data mining, data analytics, and business intelligence, why is history full of companies that have disappeared due to decisions they made that didn't turn out to be right? Organizations like Netscape and Digital Research, which were at the peak late in the last century, have more or less disappeared in the first decade of this one. Similarly, Nokia — the unchallenged king of the cell phone market until some years back — has more recently been in a struggle for survival, while newer organizations that started from a dorm room or tiny office space (e.g., Google, Facebook) have been growing by leaps and bounds. So, does this mean that there is more to decision making than data crunching analytics algorithms?

When organizations spend millions on data mining, data analytics, and business intelligence, why is history full of companies that have disappeared due to decisions they made that didn't turn out to be right?

This article will explore the mechanics behind various decision-making models and examine the boundaries and use cases for each. It discusses the qualitative value that experience or intuition can add to data-driven quantitative analysis, thereby providing the best approach to decision making. It is an attempt to understand the science of the art of decision making.

OUR DECISION MAKER, JOHN

Before we take a deeper dive into this subject, let's meet John, the sales manager of a firm that specializes in manufacturing niche construction materials.

John's Big Day

John is extremely excited about his first meeting today with Mr. C, the CEO of a large construction firm that is about to start a huge construction project. Mr. C is perceived to be extremely open to new and innovative ideas that can bring efficiency to his operations, more value to his customers, and profitability to his stakeholders. If the meeting is successful, John should exceed his sales targets and get promoted. He has pinned his hopes on a new, more efficient cementing material just invented by his company's R&D department. Even though the tests for the new cementing material are still in progress, considering John's past experience with R&D's successful products and the magnitude of this opportunity, John decides to move forward.

The Good News

John is excited; Mr. C has called. The cementing material John suggested a year back has significantly reduced the construction timelines and saved several million dollars for Mr. C's firm. Mr. C has doubled his existing order. Apparently, John's decision to ignore the tests for bonding and durability was correct after all.

John's Expansion Plans

After his recent promotion, John has been working furiously on a large bid in Country X. His trusted team has done detailed feasibility analysis using the most advanced BI tools, and every slicing and dicing of data shows tremendous profitability. Interestingly, for the first time in John's experience, top local firms in Country X have not bid for this supposedly highly profitable contract. Something doesn't feel right. However, confident of the detailed analysis his team has done, John shrugs off his seemingly "baseless" thoughts and starts pre-hiring staff and buying offices in Country X.

The Not-So-Good News

John picks up his desk phone. The government of Country X has put the contract on hold due to high levels of corruption and fraud detected by an independent investigative agency in the bidding process. Since John's firm was the top (and only) bidder, and won the contract with a huge profit margin, it has received legal notice and will have to undergo financial scrutiny by government agencies. The news is out, and losses are expected to be in the millions of dollars. Not only may John get fired, but his firm may have to declare bankruptcy.

Decision-Making Hero or Goat?

John's story is a common one among executives who have to make big decisions riddled with future uncertainties, unknowns, and limited visibility. The expectation with every decision is that it will yield the desired results and stand the test of time year after year.

Based on the example above, was John right in making the first decision about an untested material that eventually proved to be successful? Should he be reprimanded for the highly calculated decision he made that ended up bankrupting his firm? Should he have trusted his intuition instead, or is there something else?

THE ANATOMY OF A DECISION

The *Oxford Dictionaries* define a decision as "a conclusion or resolution reached after consideration." It's a process of selecting the best option(s) with the expectation of producing the desired outcome(s). This section describes the process of making a decision in more detail.

Decision Incubation

Decision incubation can be defined as a stage when a gap between the current and the desired situation is observed and consecutively an objective is defined to address that gap. Decision incubation has the following four key phases:

1. **Decision trigger or objective.** A decision trigger is a well-qualified need or necessity to make a decision.
2. **Decision data element (DDE).** A DDE can be considered similar to a software variable with two key attributes — visibility and weightage (described next). The value of a DDE impacts the decision in either a negative or a positive way. For example, when John decides to propose the new construction material to Mr. C, one of the key DDEs was the risk associated with using an untested cementing material. This DDE carried high weightage due to risk and low visibility until the test results were out. Figure 1 depicts a DDE and its key attributes.

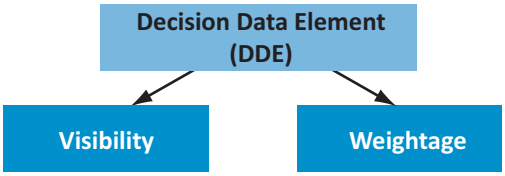


Figure 1 — Decision data element.

   - *Visibility* is the amount of factual information available for a particular DDE to help the decision maker make a decision. Decisions with a shorter shelf life (as described in the next section) mostly have DDEs that have more factual data available and consequently less dependency on assumed data.
   - *Weightage* can be defined as the relative importance of the DDE value; it is driven by the DDE's alignment to the decision objective. The greater the alignment of a DDE with the decision objective, the greater its weightage. Figure 2 shows lists of possible DDEs by category (personal, organizational, external). Table 1 presents the DDE risk matrix, which shows the interplay between various values of visibility and weightage and the associated value of risk.

The expectation with every decision is that it will yield the desired results and stand the test of time year after year.

3. **Decision processing/analysis engine.** Processing and analysis of the DDEs involves prioritization and alignment of DDEs with the decision trigger/objectives. The processing engine may include any combination of human intelligence and IT-enabled analytics engines used for analysis.
4. **Output options.** Every decision may result in several output options and corresponding strategies and implementation roadmaps. Each of the options has its respective implementation time frame and a varying degree of impact on the decision objectives.

Once a decision has been incubated, the decision execution lifecycle begins.

Figure 2 — Examples of DDEs.

Table 1 — DDE Risk Matrix

DDEs		Derived Risk	Comment
Visibility	Weightage		
Low	Low	Medium	Low visibility into a DDE would imply that the impact of the DDE and its weightage are not yet understood; hence, risky.
Low	High	High	Risky situation due to high weightage and low visibility; difficult to initiate risk mitigation.
High	Low	Low	High visibility ensures that the weightage doesn't change later; therefore, low risk.
High	High	Low	High visibility and high weightage ensure that all possible risk-mitigating actions are being taken.

Decision Execution Lifecycle

The *decision execution lifecycle* (see Figure 3) is defined by the phases after decision incubation that a decision goes through for execution:

1. **Inception** is the point at which the execution of a decision — made after going through the decision incubation phases — starts. At inception, the decision has high potential value and is most viable.
2. **Maturation** is when the investments made for a decision have yielded results, as signified by a positive ROI.
3. **Expiration** occurs when the decision has yielded a return and is no longer viable. The context that made the decision feasible at the inception point and thereafter is no longer relevant due to changes in DDEs and an increase in uncertainties.

Table 2 presents the decision execution lifecycle matrix, which shows the values of various decision elements at each of the three stages.

The time frame within which the decision is valid and has a viable proposition is known as the *decision shelf life*, which is similar to the expiration date or warranty

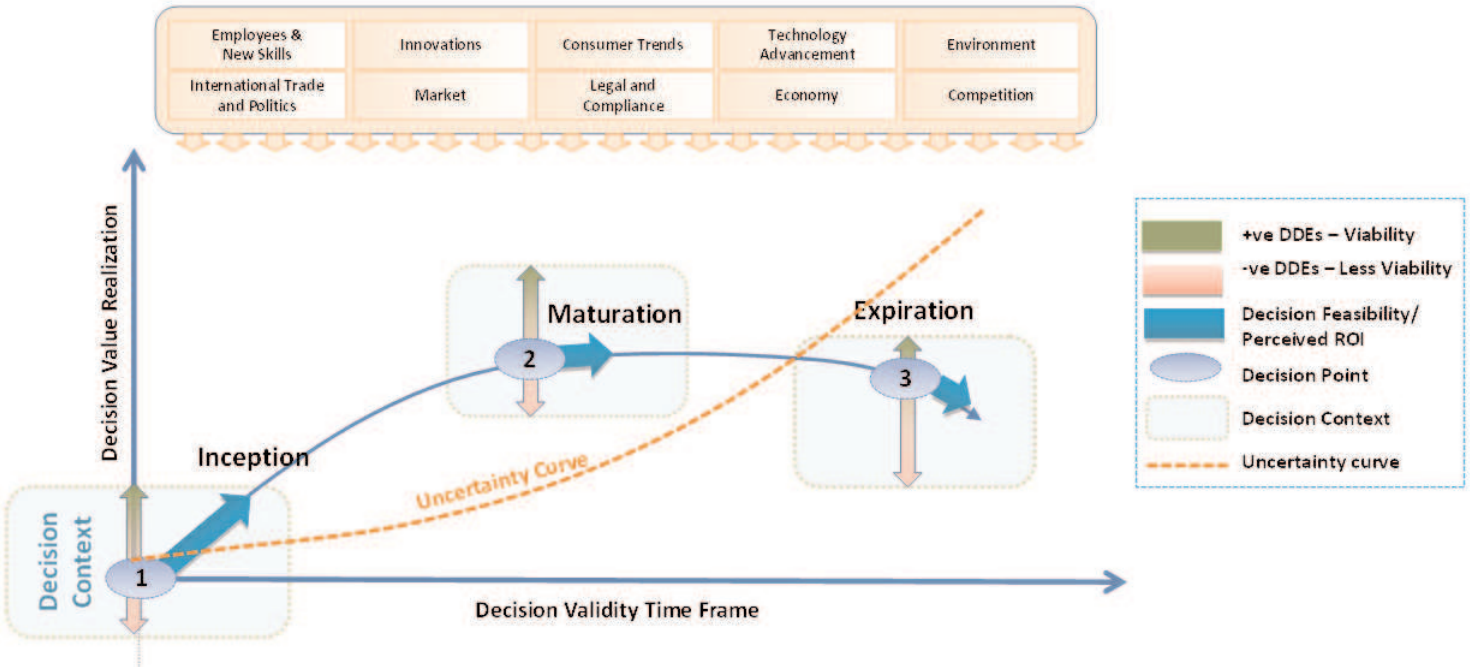


Figure 3 — Decision execution lifecycle.

Table 2 — Decision Execution Lifecycle Matrix

	Inception	Maturation	Expiration
Potential value	High	Low	Low
Kinetic value	Low	High	Low
ROI	Negative/growing	Positive/stagnant	Low/receding
DDE Assumptions	High	Low	Low
DDE Alignment	More positive than negative	More positive than negative	More negative than positive

period of a consumer product. The amount of value that the investment made in a decision is yielding at any given point of time is known as the *decision value realization*. An incepted decision is based on some factual/highly visible DDEs and other not so visible/assumed DDEs. The growth of uncertainties with the passage of time may result in less weightage for older DDEs, which were more relevant in the past, while some newer DDEs more relevant to the current context may appear and gain more weightage. The impact of this is represented by the dotted-line curve known as the *uncertainty curve*.

Once a decision is executed, it needs to be maintained at regular intervals to keep the decision's viability high. Maintenance requires analyzing the context of a decision and making changes, just as an IT department maintains a software product deployed in an organization by making regular hardware and software updates to keep its viability high. Unless maintained, a decision may lose its viability faster.

Decision Context (DC)

Decision context (DC) is a snapshot of a decision point at a given instance in time and contains instantiated values for:

- Visibility and weightages for relevant DDEs
- Decision processing/analysis engine
- Weighed output options

A DC is analogous to a software object that has been instantiated and has certain values for each of the variables in the software class. Figure 4 shows decision context.

QUANTITATIVE FINITE DECISION MODEL

A DDE-driven decision model for which two key external inputs — DDEs and a set of rules/conditions — reside within a well-defined system/decision boundary is known as a *quantitative finite decision model*. An automated IT application deployed within an organization where all the ingredients for making a decision are available within the boundary is an example of such a model. This type of system is characterized by complete control of all aspects: problem domains (sets of problems the system is expected to solve), DDEs, and the processing engine/rules. Figure 5 presents a quantitative finite decision model.

A quantitative finite decision model in its ideal state of purity should require no human intervention. The frequently conducted automation initiatives in IT or IT

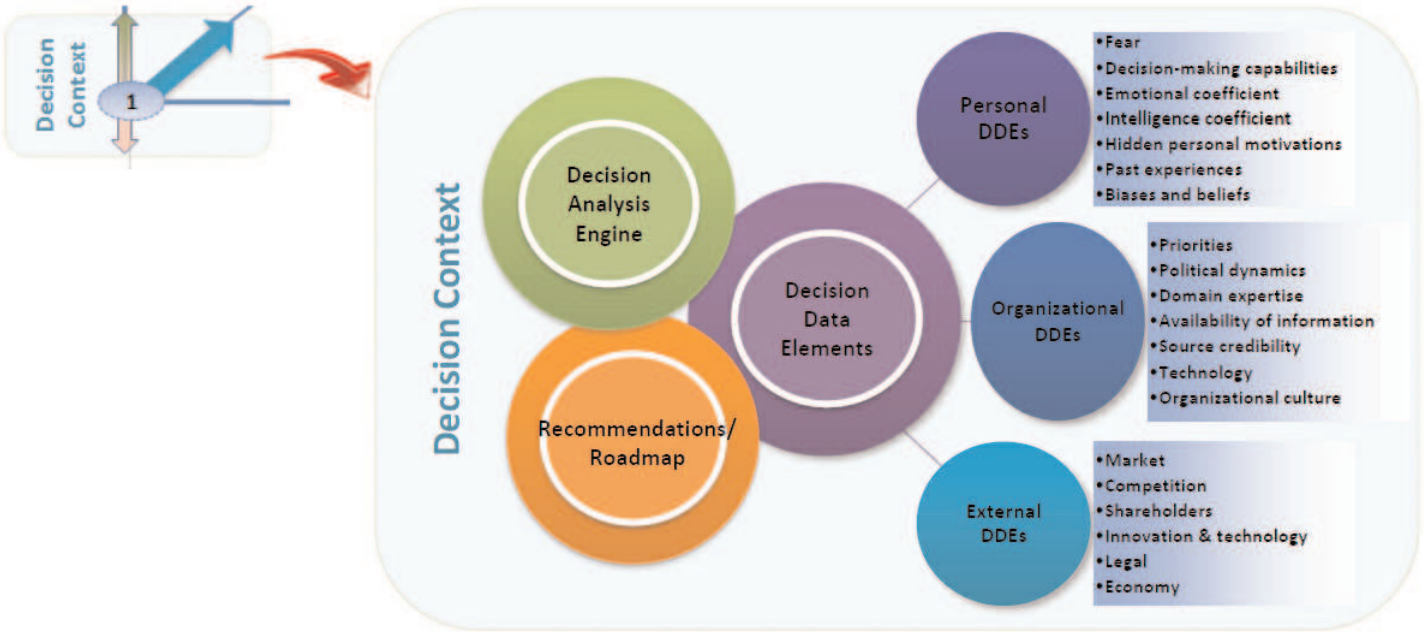


Figure 4 — Decision context.

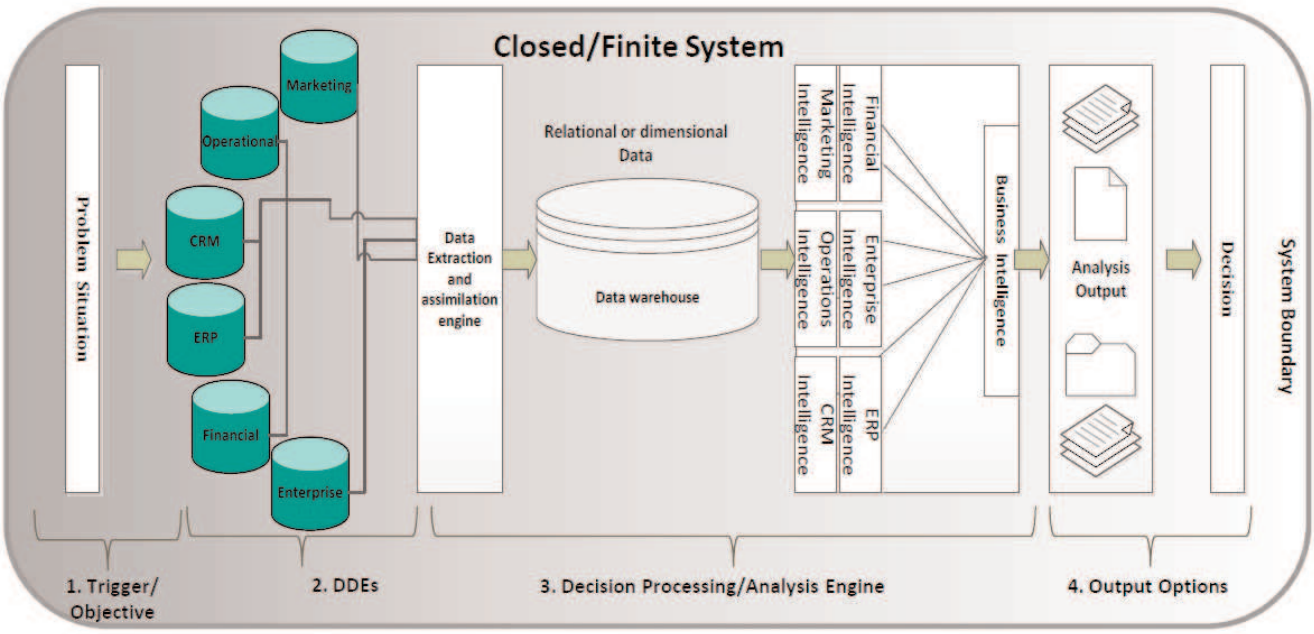


Figure 5 — Quantitative finite decision model.

systems deployed internal to an organization are some examples; likewise, some large-scale implementations that encompass all the digitally enabled organization functions (e.g., marketing, operations, CRM, ERP, financial systems). The most successful use cases for a quantitative finite decision model are those where:

- It's easy to reproduce a set of situations through a set of data.
- The system is closed and has defined, finite boundaries.
- Actors' choices and actions are finite and are expected to act in a predetermined way.
- Output options and recommendations have a defined, limited set.
- Management and/or decision makers are less experienced in the particular decision domain.

For example, within the digitally enabled domain of the enterprise, operational expenditure reports gave good insights into the areas where maximum expenditure occurred and, combining it with the product sales and profitability data, provided meaningful insights into investments, expenditures, and the key areas in the organization with maximum return on investment. Random data started revealing trends, and organizations received insights into data like never before.

"Great! That's amazing! That's just what we need!" the world must have thought. But is this system of decision making perfect? Or is there more to it?

There are some inherent disadvantages to the quantitative finite decision model approach. For example, this approach is aligned to a closed and finite environment, and thus impacts or variations due to most external/real-world factors like weather, buying trends, seasonal variations, and so on are not considered. It provides insights into past data by finding patterns using pre-fed rules and prioritization attributes, but it doesn't necessarily predict future trends. Also, the analysis engine is only as accurate as the data, which could be based on undocumented and unaccounted assumptions that affect accuracy. As a result of these deficiencies, the *quantitative semi-finite decision model* was born.

QUANTITATIVE SEMI-FINITE DECISION MODEL

The next level of evolution — the quantitative semi-finite decision model — includes two major elements: (1) DDEs based on historical trends, and (2) more real-world DDEs based on events such as weather, world politics, news, the market index, and the like. For example, most consumer product organizations have developed fairly accurate decision/simulation models of demand fluctuations based on holidays and weather, and they optimize resources accordingly. Several shipping and logistics organizations are incorporating third-party weather and currency fluctuation information into shipping and container routing decision models in order to automatically select the best and most economic route for shipping containers. Decision makers appreciate the improved accuracy and near-real-life, model-based predictive outputs.

"Great! That's amazing! That's just what we need!" the world must have thought yet again. But is there more?

While the finite and semi-finite decision models have helped organizations introduce greater accuracy to decision making, the real world is still miles away from its closest digital counterpart. The question is how to incorporate DDEs that mimic real-world situations with respect to visibility and priority, thereby turning the finite and semi-finite decision models into an infinite open decision model. One response is that until the real world manifests a digital copy of itself, it's not possible. There will always be countless unknown real-world DDEs that introduce an element of uncertainty and have a significant potential to impact the decisions. This would make them nonviable, unless the organization continuously steers and counter-steers the decision through continuous additional planning and investments. So, must executives wait until the digitization of the world is complete and available to decision models, or is there a possible alternative?

Maybe there is. It's the oldest pattern recognition–based predictive intelligence analysis model known to humankind, and it's commonly called *intuition* or *experience*. We can define intuition as the ability of an individual to predict future events without seemingly relying on any structured information, or the individual's ability to predict the future viability of a decision option based on historical precedents. Some individuals are inherently good at this and some are not, and that's what makes it more of an art specific to individuals than a scientific discipline that can be learnt and mastered by everyone. Maybe that is the reason intuition/experience has traditionally been rated low among decision-making approaches, as it is considered to be based on unstructured information, riddled with biases, and influenced by emotional characteristics. More than that, intuition doesn't work according to the corporate model of developing consensus on a decision by sharing the underlying data and logic, and so it is categorized as irrational. But is that really so? The following section

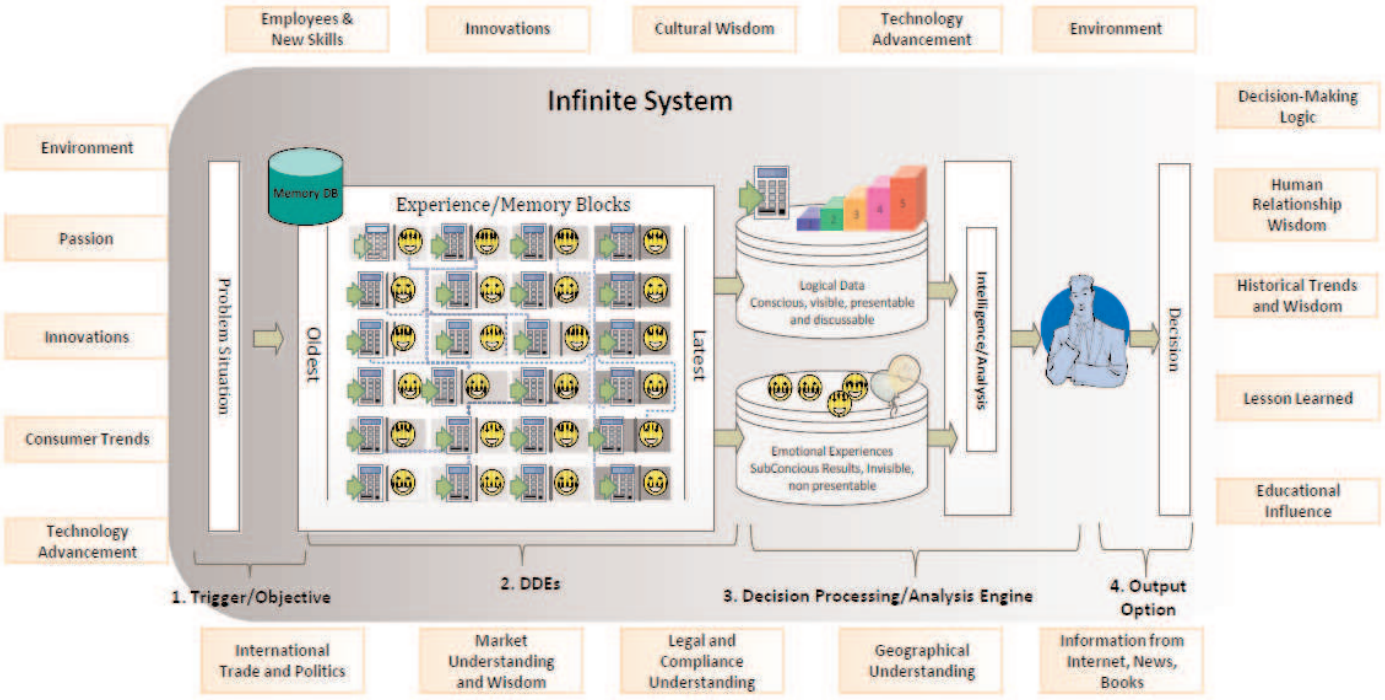


Figure 6 — Qualitative infinite decision model.

describes the *qualitative infinite decision model* (based on experience and intuition) in detail (see Figure 6).

QUALITATIVE INFINITE DECISION MODEL

The process of intuition relies on the complicated patterns formed by the brain between different memory blocks commonly known as experience. Memory blocks can be visualized as an enriched representation of DDEs containing not only the factual information, but also the emotionally enriched information (see Figure 7). For example, in a typical scenario in which an IT vendor provides services to a firm, the traditional data-driven DDEs may just capture the performance statistics, such as on-time deliveries or defect densities. Enriched DDEs (memory blocks) could also capture valuable information regarding the quality of the overall experience the firm had with the IT vendor, including elements like attitude, flexibility, dedication, and alignment to purpose of the vendor resources, which form important parameters for future decision making.

Enriched DDEs can get data from an almost infinite number of sources, such as books, TV, news, the Internet, the organization, friends, family, educational curricula, and so on. Due to the many sources of inputs, enriched DDEs form unknown affinity patterns, and these patterns are the ones responsible for most of the innovations. Innovations in the world of intuition are nothing but data cross-linkages from past experiences that lead to newer innovative combinations to solve new problems. For example, the calligraphy Steve Jobs learned during his college days formed an important part of the design philosophy behind Apple products. Similarly, the concept of designed structural failure led to the invention of the opening mechanism for a Coke can. Such cross-linkages also help predict and gauge the effect of future uncertainties on decisions that were based on similar past experience in a related or unrelated field.

There are some common traps that executives must avoid to keep intuition as neutral as possible:

- Confusing a hidden motivation with intuition
- Ignoring intuitive decisions — even when they are the correct ones — in favor of decisions with greater public appeal
- Overconfidence due to successful historical precedents

In order to take maximum advantage of this art, it is important for an individual to develop and nurture this ability to detect, understand, and utilize intuition/experience qualitatively to derive quantitative results.

Some of the most successful use cases for infinite qualitative/intuitive decision-making models are found in situations where:

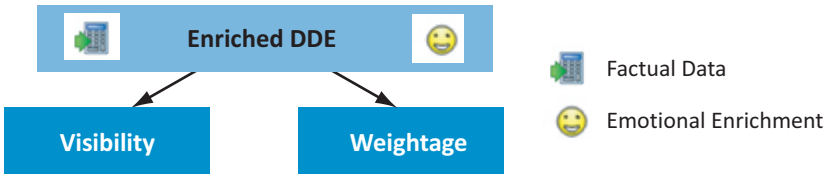


Figure 7 — Enriched DDEs.

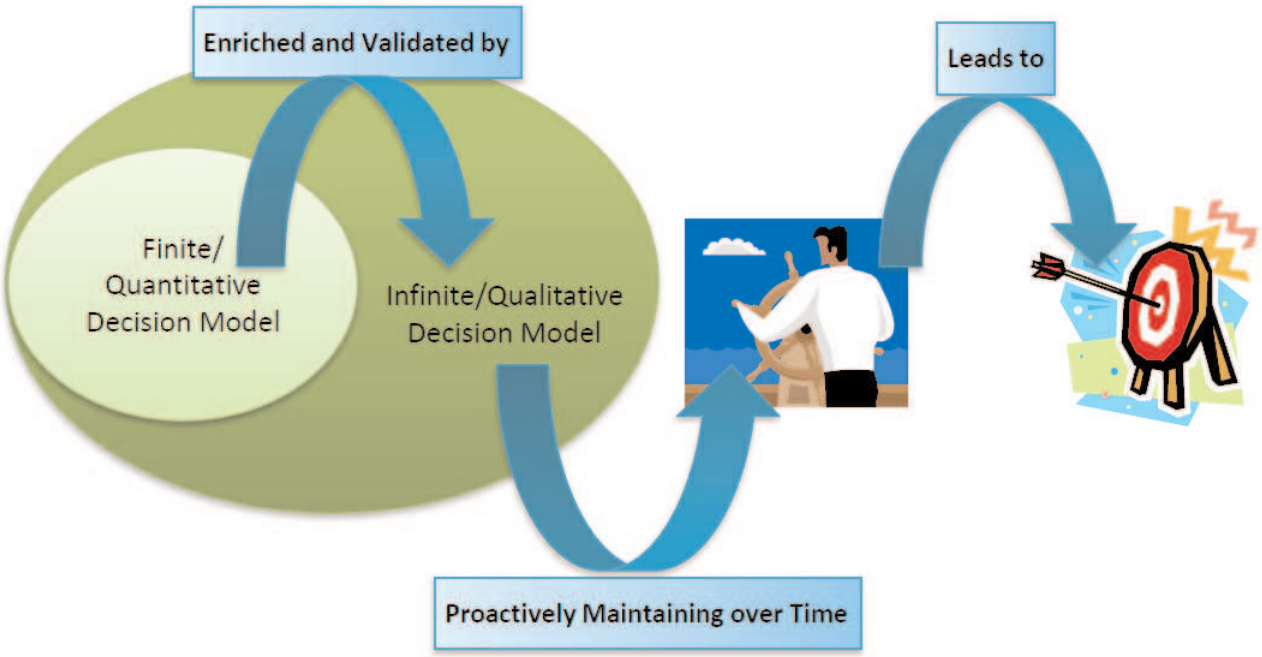


Figure 8 — A hybrid decision-making approach.

- There are systems with open and infinite boundaries.
- There are no historical precedents.
- Inventing something new/innovating is the key.
- The data model is highly unstructured and doesn't replicate the problem situation digitally.
- The picture must be seen and understood as a whole rather than in parts.
- You are a subject matter expert.

BETTER TOGETHER

Is a qualitative infinite decision model (aka intuition) the perfect model for decision making? No, it's not, but neither are any of the quantitative decision models. Until IT reaches a level of maturity where all aspects of the human environment get digitized, a perfect decision-making model may not be available. Instead, the synergies generated by both quantitative and qualitative models must be leveraged — each to its own strength — to come up with decisions that are as robust as possible (see Figure 8).

For most closed/finite business situations with well-defined boundaries, quantitative finite or semi-finite decision models can be used effectively. For scenarios in which external data elements have an important impact on decision making, care must be taken to enrich the results of finite data models by applying experience and intuition appropriately. In order for a decision to stand the test of time, the organization must review it consistently, validate its viability, and update the decision context through investments — no matter what decision-making model is used.

Sachin Mahajan is a consultant with Tata Consultancy Services and has over 14 years of experience in various IT domains, spanning business and IT architecture consulting, enterprise architecture, project management, and other areas. He has provided IT and business and IT architecture consulting services for various clients in different geographies, including India, the US, the UK, and Asia Pacific. He can be reached at sachin.mahajan@tcs.com.

ACCESS TO THE EXPERTS

Cutter Membership

The ultimate *Access to the Experts*

With unlimited access to Cutter's research, inquiry privileges with Cutter Senior Consultants and Fellows, regular strategy meetings for your team with a Cutter expert, virtual roundtables and peer-to-peer networking led by Cutter thought leaders, free or discounted admission to events, and more, your Cutter Membership opens up multiple avenues to interact with Cutter's experts to brainstorm and gain guidance aimed at boosting success. Like everything IT, one size does not fit all. That's why we encourage you to choose the Membership level that's right for your organization:

"I am amazed that this venue exists; that I can listen and interact with these individuals. I am more amazed that I have not done this before."

— Mark Rubin,
Fidelity Investments,
USA

"Cutter seems to be unique in consistently providing information one can immediately put into action or clarify one's thinking on day-to-day problems. The service provides tremendous value for the money."

— Lloyd Fletcher,
Information Systems Manager,
Institute of Physics Publishing,
Bristol, UK

Full Membership

Best for organizations seeking personal, real-time guidance on the full gamut of business technology and software engineering issues and dedicated to investing in the career development of their entire staff.

Business & Enterprise Architecture

Best for organizations interested in using architectural approaches to manage the complexity and cost of IT and to pave the way for strategic planning and portfolio management.

Agile Management

Best for software and product development organizations that are seeking to create and capture lasting value through end-to-end Agile initiatives.

Business Technology Strategies

Best for organizations developing operationally sound strategies and plans that link and align business and IT, and harnessing the latest leadership and management techniques to ensure IT is furthering the mission of the business.

Data Insight & Social BI

Best for organizations challenged with data collection, analysis, and integration as well as internal- or external-facing information sharing via social, mobile, or legacy apps.






Membership Benefits

- Continuous flow of advice, insight, and answers via enterprise access to written and multimedia research from Cutter's top experts
- Priority Access to the Experts: get near-real-time answers to your questions
- Regular strategy sessions with Cutter Practice Directors or Senior Consultants
- Admission to client-only online Q&A sessions
- Participation in peer-to-peer discussions led by Cutter's experts
- Cutter events
- Add-on options for consulting and training offerings

And more ...

To arrange for a free trial membership or to discuss how Cutter's consultants can help your organization, contact our team today: sales@cutter.com or +1 781 648 8700

What's Unique About Cutter?

- Cutter's internationally recognized expert practitioners provide all of Cutter's research and analysis. You get to tap into this brain trust whose written words have been likened to a "consultancy in print."
- Without exception, every single inquiry is fielded by a Cutter Senior Consultant, Fellow, or Practice Director.
- Cutter approaches every consulting or training assignment as unique, requiring a tailor-made solution, and creates a team for you that includes only its best-in-class experts. We focus on knowledge transfer, so you can leverage our work together and move forward on your own.
- With Cutter, you get cutting-edge thinking from multiple viewpoints so you can determine what's best for your situation.
- Emphasis is on strategies and processes, so you can be sure your success is not dependent on vendor/product detail.
- Cutter is unique in having no ties to vendors. Rest assured that the advice you get is unbiased and in the best interest of your organization alone.
- Focus includes the business management of IT — you're plugged into the research from top business thought leaders.

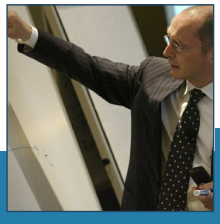
"I have personally been able to leverage Cutter's services since 1999. Among the attributes that differentiate Cutter from other firms, two remain at the top of my list — *Thought Leadership* and *Real Value* — executed in a practical way.

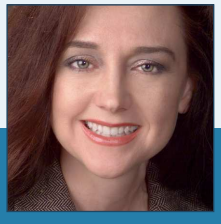
Thought Leadership is driven by Cutter's experts. The advantage is that Cutter doesn't pitch a single best practice for a given area. Instead, Cutter provides multiple good practices/options that come from both academic rigor as well as on-the-ground experience. This provides several benefits for Dairy Farmers of America:

- Exposure and awareness of proven good-practices — particularly for IT, but also for overall business leadership and management
- A finger on the pulse of emerging good practices and IT-impacting trends
- Options for improving our performance
- The opportunity to develop relationships with the experts

The last, 'Access to the Experts,' drives the *Real Value*, letting us go beyond just understanding the options. We can develop relationships with the experts and tailor the options so that they can be quickly and practically executed within our organization, enabling our Business Technology team to continually improve, engage, and contribute to business growth."

— Doug Mikaelian,
VP Business Technology,
Dairy Farmers of America


About Cutter Consortium

Cutter Consortium is a truly unique IT advisory firm, comprising a group of more than 100 internationally recognized experts who have come together to offer content, consulting, and training to our clients. These experts are committed to delivering top-level, critical, and objective advice. They have done, and are doing, groundbreaking work in organizations worldwide, helping companies deal with issues in the core areas of software development and Agile project management, enterprise architecture, business technology trends and strategies, enterprise risk management, metrics, and sourcing.

Cutter offers a different value proposition than other IT research firms: We give you Access to the Experts. You get practitioners' points of view, derived from hands-on experience with the same critical issues you are facing, not the perspective of a desk-bound analyst who can only make predictions and observations on what's happening in the marketplace. With Cutter Consortium, you get the best practices and lessons learned from the world's leading experts, experts who are implementing these techniques at companies like yours right now.

Cutter's clients are able to tap into its expertise in a variety of formats, including content via online advisory services and journals, mentoring, workshops, training, and consulting. And by customizing our information products and training/consulting services, you get the solutions you need, while staying within your budget.

Cutter Consortium's philosophy is that there is no single right solution for all enterprises, or all departments within one enterprise, or even all projects within a department. Cutter believes that the complexity of the business technology issues confronting corporations today demands multiple detailed perspectives from which a company can view its opportunities and risks in order to make the right strategic and tactical decisions. The simplistic pronouncements other analyst firms make do not take into account the unique situation of each organization. This is another reason to present the several sides to each issue: to enable clients to determine the course of action that best fits their unique situation.

For more information, contact Cutter Consortium at +1 781 648 8700 or sales@cutter.com.

The Cutter Business Technology Council

The Cutter Business Technology Council was established by Cutter Consortium to help spot emerging trends in IT, digital technology, and the marketplace. Its members are IT specialists whose ideas have become important building blocks of today's wide-band, digitally connected, global economy. This brain trust includes:

- Rob Austin
- Ron Blitstein
- Tom DeMarco
- Lynne Ellyn
- Israel Gat
- Vince Kellen
- Tim Lister
- Lou Mazzucchelli
- Ken Orr
- Robert D. Scott