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Contents

3

From the Editors

5

The Neuroscience of Enterprise Risk Management

18

Emerging Technologies:
How Can ERM Play a Part?

24

Risk-Based Decision-Making Framework for Blood Safety

29


Rethinking Reputational Risk:
The Book Review



The Neuroscience of Enterprise Risk Management

Diana Del Bel Belluz

ERM



I am often asked by young professionals, “How do I become a risk management practitioner?” My answer is to develop skills in two areas—analytics and people. The requirement for strong analytical skills explains why it is typical to see risk professionals who have a background as accountants, actuaries, auditors, regulatory compliance officers, engineers, insurance experts, lawyers, and safety experts.



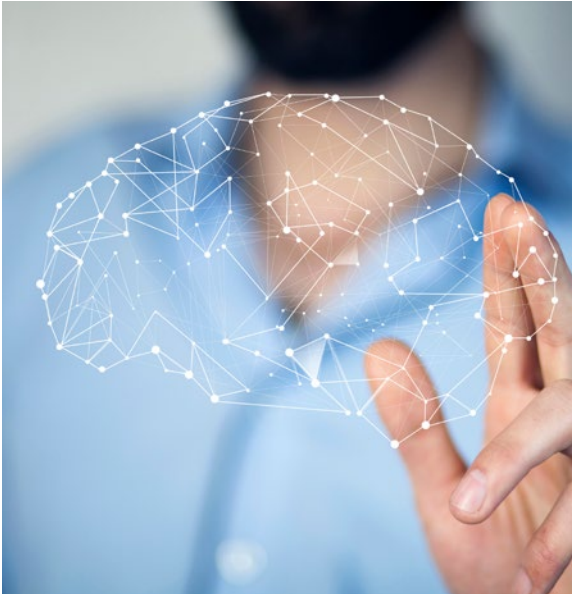
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While analysis and reporting are necessary for good risk management, they are by no means sufficient. This is because accurate and thorough risk analysis and reporting alone will not enhance an organization’s risk intelligence. To deliver risk intelligence that enhances organizational performance and resilience, risk professionals must be able to motivate managers to consistently consider risks in an objective manner, and to act on those risk considerations to make risk-informed decisions. That requires strong people skills.

When I use the phrase *people skills*, I’m not referring to popularity or charisma. To achieve an enterprise risk management (ERM) program that is effective and sustainable, the risk management executive must encourage the organization’s leaders and decision-makers to integrate risk management *thinking* into their business processes and behaviour. To guide the organization to embed ERM into business practices, ERM leaders need strong knowledge, skills, and experience in disciplines that focus on the human element of risk management. These include organizational design, change management, behavioural science, cognitive science, and neuroscience.

Applying knowledge from the world of neuroscience is essential for an effective and sustainable risk management program.

In this article, I will make the case that understanding and applying knowledge from the world of neuroscience is essential for an effective and sustainable risk management program. I will do this by offering some explanations of three common ways that the human brain impedes good risk management, as well as some strategies for overcoming these barriers.



In his book *Thinking, Fast and Slow*, Daniel Kahneman (a psychologist and winner of the 2002 Nobel Memorial Prize in Economic Sciences) explains how humans have two modes of thinking: System 1 (Fast) and System 2 (Slow).¹

System 1 thinking is automatic, intuitive, and instinctual. It is the kind of thinking we use when we decide to run if a tiger crosses our path. We don't stop to analyze how hungry the animal is, calculate the probability of it attacking us, or identify all the potential consequences of a tiger attack. According to Kahneman, System 1 enables humans to “read” their environment. It can instantly gauge the intangible values that stakeholders expect to be applied in balancing risks and rewards. It also recognizes patterns and detects changes in the environment as they are occurring—not just when it's time to do the annual risk report.² System 1 enables us to decide instantly and automatically, without conscious thought. This occurs because System 1 has developed a series of *mental* rules of thumb. These rules save us from engaging System 2 and expending significant mental energy on conscious thought, while also helping us to avoid danger. When we use intuition (and our gut) to decide what to do about a risk, we are relying on System 1.

System 2 thinking is deliberate, effortful, and reasoned. It is the kind of thinking we use to navigate a complex task such as putting a human on the moon or developing and executing corporate strategy. System 2 enables humans to analyze and plan. We are relying on System 2 when we use analytical processes to identify, quantify, and weigh an organization's principal risks to consciously decide which are a priority for management attention and resources, and how best to address them. System 2 enables us to methodically evaluate various potential scenarios to optimize our ultimate choices. When we use systematic analysis to decide what to do about a risk, we are relying on System 2.

Effective risk management combines the strengths of both System 1 and System 2.³ Relying on either intuition alone (System 1) or on analysis alone (System 2) could be considered a “half-brained” approach to ERM because it would mean forgoing the unique advantages of the excluded system. In the balance of this article, we'll examine three common ways that our brains impede effective risk management. And, we will offer strategies to overcome those barriers.

Three Ways Our Brains Get in the Way of Risk Management and What to Do About It

In his book *The Power of Fifty Bits: The New Science of Turning Good Intentions Into Positive Results*, Bob Nease points to three reasons why our brains get in the way of doing what is in our own interests. That is, he asserts that our brains are laggy, lazy, and distracted.⁴ Let's look deeper into the implications of our brain's wiring on risk management, as well as strategies that ERM executives can use to counteract the human factor pitfalls that our laggy, lazy, distracted brains can create for risk management.

1. Our Brains Are Laggy

Cool Neuroscience Fact

System 1 developed over millions of years. And, our brains are stuck far in the past when, for the major part of our evolutionary history, we were hunter gatherers in a harsh, but fairly stable, environment. Fast forward to today where we function in a radically different environment. From an evolutionary perspective, our brains have not had time to adapt to the major changes that have happened since the industrial revolution. This means our System 1 brains are “living fossils” that continue to produce instincts and inclinations from a caveman’s environment even though we live in a fast-paced, complex, technological world.

Implication for Risk Management

Our System 1 (fast, automatic thinking) brain is hard-wired with “thinking short cuts” that are optimized for the kind of decisions humans made in the caveman environment. Consequently, it introduces biases that undermine the thinking we need to do for the kind of decisions we need to make in today’s world. Kahneman cautions that System 1 has three drawbacks—i.e., it has distinct biases, is prone to error in certain circumstances, and has little understanding of logic and statistics.⁵ These shortcomings of System 1 mean that risk management leaders need to be very cautious about relying on intuition alone for making decisions about enterprise risks that are novel or rare. The reason is that decision-makers likely don’t have enough experience with those risks to have developed an accurate mental model that enables expert risk management judgment.

An example of how System 1 develops mental models that enable effective *automatic* thinking is driving a car. When a person first learns to drive, he or she consciously and deliberately thinks through every decision. These decisions include actions such as when to accelerate and at what rate; when to brake; whether to hit the brake pedal hard, or to gently pump it; and how sharp or wide to take a turn. Any distraction could cause a new driver to make an error in judgment that leads to a collision or loss-of-control incident. But, over time, by repeatedly making driving decisions and getting immediate feedback (i.e., gaining experience), a driver develops a mental model that System 1 can use to automatically make driving decisions without relying on conscious thought. In other words, experience allows us to “train” our brains to automatically drive a car.

When we have developed an accurate mental model, we can rely on System 1 to make sensible decisions. For example, most seasoned drivers will have had the experience where they arrive (safely) at their destination, yet are unable to recall a single detail of large segments of the trip. This happens when System 1 is functioning in the background using its “driving a car” mental model to automatically take care of all the driving decisions, while our conscious System 2 brain is focused elsewhere.

However, when we try to apply a System 1 mental model to a novel situation, we can make poor decisions. For example, a person who has only driven in tropical climates rents a car while on a ski holiday and unexpectedly approaches an amber light on a snow-covered road. This person might brake hard as would be normal in the sunny south. But on snow, the car might begin to slide, and the driver could ultimately lose control of the vehicle. Drivers would commit this driving risk management error because their mental model for driving wasn’t developed under snow and ice conditions.



Conversely, drivers with years of winter driving under their belt would instinctively know that snow can make the road surface slippery. They would also be aware that, if there is ice underneath the snow, there is a very good chance that they could spin out if they brake hard. Their accurate winter driving mental model would lead them to naturally brake lightly—or perhaps even tap the brakes a few times—to gradually come to a stop while maintaining a grip on the road and control of the vehicle.

The same holds true for our business risk management decision-making mental models. They can work effectively under the risk conditions by which the mental models were developed. But when we try to apply them to risk situations that are new or unusual, we are much more likely to make poor quality decisions because mental models don't work well in an unfamiliar situation.

A Strategy to Counterbalance the Effect of Our Laggy Brains

For routine decisions, leverage the power of System 1's capability for spot-on instinctual behaviour.

System 1 works best for decisions about familiar situations with short-term implications.

In this instance, the brain has evolved thinking shortcuts and instinctual behavioural habits that are based on an accurate mental model developed through repeated experience. While we may not be able to take an evolutionary shortcut, we can “train” people's System 1 (fast thinking) to form good habits that increase the likelihood of making “correct” risk management choices for routine issues that we encounter regularly.

We can safely use System 1 to manage routine risks by using a combination of solid decision processes, training people to use those processes, providing a supportive decision environment, and then following up with compliance auditing to ensure decision processes are being applied correctly. Undoubtedly, many of you are already doing some of these things in your organization for operational risks.

To illustrate the elements required for developing good decision-making for routine decisions, let's look at an everyday decision that most organizations handle—i.e., managing day-to-day financial transactions.

- **Design:** Typically, the finance department establishes procedures that ensure transparent, timely reporting and also that guard against fraud or theft.
- **Training:** Employees in every department receive initial (and refresher) training to ensure they know how to apply those financial management protocols and why it's critical to follow them.
- **Supportive environment:** Forms or computer programs are easy to access and guide employees to apply the procedures in a consistent way. Incentives and/or disincentives are used to motivate employees to follow the procedure, reinforce desired behaviours, and discourage the temptation to take shortcuts.

- **Audit:** There are checks done to ensure that people are actually following the procedures and that the procedures, including the associated incentives and disincentives, are working as intended.

No doubt, if you examine the way each of your major operational risks is managed, you will discover you are using all four of the above elements: design, training, supportive environment, and audit. If you are missing any of the elements, you may not be able to expect robust and consistent risk management decision-making. Now let's turn to non-routine decisions.

2. Our Brains Are Lazy

Cool Neuroscience Facts

In *Thinking Fast and Slow*, Kahneman thoroughly explores the major drawbacks of System 2, including it's slow to engage and gets depleted very quickly.⁶ Our System 2 brain can be characterized as lazy because it acts like a mental couch potato in a couple of important ways.

First, rather than directing our attention to engage our powers of analytical thought, our brains are wired to instead rely on heuristics and other thinking shortcuts or mental rules of thumb that can flaw our thinking. As Nease explains: "We pay little attention to much of what we do. If the status quo isn't painfully broken, and if an alternative doesn't tickle our fancy, we are apt to let things ride."⁷ In other words, our System 2 brain would rather sit on the couch than start thinking deliberately.

Our System 2 brain would rather sit on the couch.

Second, on top of being difficult to engage, System 2 also gets tired and depleted quickly. The effects of decision-fatigue typically begin within 30 minutes of engaging System 2—and the longer we use System 2, the more depleted it gets. This is why after a day of making decisions, especially tough decisions with difficult trade-offs, we feel exhausted and unable to think straight. For instance, Danziger, Levav, and Avnaim-Pesso have shown that judges in court make less favourable decisions later in the day than early in the day when their brains are still relatively fresh.⁸ In other words, even when our System 2 brain does kick in, it quickly gets fatigued and falls back on the couch, letting System 1's automatic thinking make decisions instead.

Implication for Risk Management

The laziness of our System 2 brain causes us to default to System 1 automatic thinking rather than making the effort to think through a decision analytically. When we rely on System 1's handy heuristics, we become prone to some distinct biases that undermine the quality of our decisions. This can have serious consequences for decisions on non-routine risk management issues that require deliberate, conscious consideration. For example, it is typical for executive leadership teams to spend most of a risk workshop on quantifying the organization's major risks and then trying to quickly prioritize the risks in the last few minutes of the session. By the end of the workshop, the participants are feeling the effects of decision fatigue and time pressure. Therefore, they don't have the time or mental energy to conduct a proper evaluation of which risks merit additional management attention and resources to bring them into alignment with the organization's desired risk appetite. Often, there is no time left in the workshop to think through an effective strategy to manage the risk. Thus, this task gets deferred to a later date and sometimes never happens.

In the quarter of a century that I've been in the risk field, I've consistently observed that when executives and board members of companies that don't have an ERM program examine their organization's past risk management failures, they usually sheepishly admit that important information was either missed or omitted. This was likely due to a shoddy, slapdash, or subjective risk assessment process; or that the risk management response was either inadequately designed to properly address the risk or was never fully implemented or resourced. Therefore, when the risk event actually occurred, the organization was not ready to respond.

The lesson here is to ensure you create and apply rigorous, yet simple, processes to convince executives to consider the organization's principal enterprise risks—particularly when making strategic decisions.



A Strategy to Counterbalance the Effect of Our Lazy Brains

For one-off decisions on material risk issues, leverage System 2's powerful capabilities for complex analysis and planning.

System 2 is best suited for making decisions in situations that involve complex, uncertain, and unfamiliar circumstances. These are characteristics often associated with an organization's principal risks. This is because System 2 enables the analytic thought required to handle complexity and to think through the longer-term implications of decisions and actions.

The neuroscience research shows that the human brain is simply not wired to *intuitively* evaluate complex risks. Thus, adopting an ERM program that is underpinned by a robust framework and tools seems like an obvious way to support System 2-style deliberative, *analytical* thinking. The main benefit that an ERM program provides is a consistent way to identify, analyze, and manage an organization's principal risks.

Benchmarking studies show that organizations with mature ERM programs perform better than those without a mature program. A risk intelligence benchmarking study (Risk Intelligence Benchmarking Survey) was conducted this year by Risk Wise. It showed that organizations with at least one year of experience on the ERM journey scored 5 per cent higher compared to organizations that hadn't yet begun to implement ERM. As well, organizations with more than five years on the ERM journey scored nearly 20 per cent higher on risk intelligence.⁹ Yet, according to Beasley, Branson and Hancock's most recent survey on ERM maturity, "the majority of organizations appear to be fairly unstructured, casual, and somewhat ad hoc in how they identify, assess, and monitor key risk exposures."¹⁰

For strategic issues, particularly those that are one-off decisions, we need to design and implement simple, yet rigorous, processes to enable executives to identify and weigh risks and to judge the level of alignment with the organization's appetite and tolerance for risk. To ensure the ERM processes we implement are robust, we need to be aware of common cognitive biases that occur with System 1 and System 2 and ensure that the organization's decision processes are designed to minimize them in the evaluation of risk considerations. Here are a few common cognitive biases and strategies to minimize them in ERM.

- **Decision fatigue**—refers to the deteriorating quality of decisions made by an individual after a long session of decision-making.¹¹ Most ERM programs use group meetings/workshops as the main vehicles for ERM conversations. The longer the duration of the ERM workshop and the later in the day it is held, the more likely that people will have depleted their mental reserves and will not bring their best thinking to the table for at least part of the workshop.

To counter decision fatigue in ERM, risk leaders can use a variety of brain-friendly strategies, including:

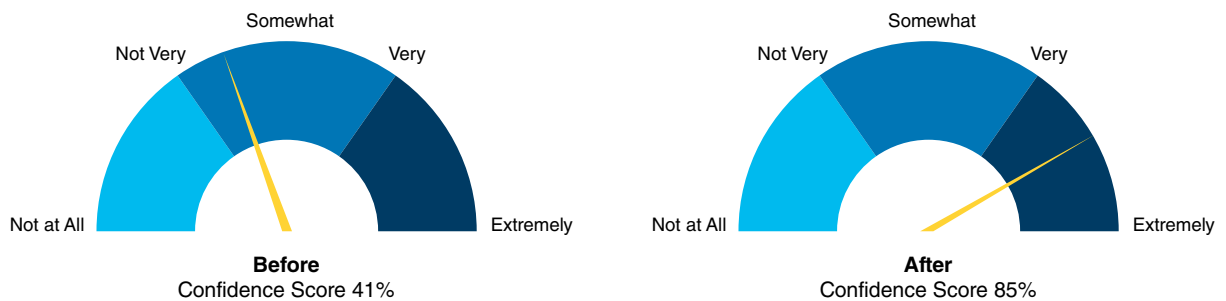
- Keeping ERM tasks and the overall duration of workshops short, and providing breaks between tasks. Research by Danziger, Levav, and Avnaim-Pesso discovered that the decisions that judges make are strongly influenced by how long it has been since their last break. “We find that the percentage of favorable rulings drops gradually from ≈65 per cent to nearly zero within each decision session and returns abruptly to ≈65 per cent after a break.”¹² That's good evidence to avoid marathon-style ERM workshops.
- Shifting evaluation activities out of a group workshop setting and into “alone time.” This enables participants to take their time and to do their thinking when their brain works best.
- Giving people adequate time before a workshop or meeting to consider the decision options at their convenience, rather than forcing them to do System 2 thinking within the time constraints of a meeting.
- Putting critical System 2 thinking activities at the beginning of the meeting—i.e., before decision fatigue sets in.
- “Shuffling” the order in which risks are evaluated. This strategy is particularly useful when multiple individuals or groups are evaluating the same set of risks (e.g., a bottom-up risk identification exercise for an annual risk profile process). It is also helpful when an individual is reassessing a set of risks on a routine basis (e.g., monthly or quarterly reporting). This gives each risk an opportunity to be thoroughly analyzed before decision fatigue affects the evaluator's brain.
- **Anchoring bias**—occurs when we rely too heavily on the first piece of information offered (the anchor). Brainstorming is often the primary approach for risk identification. If it's unstructured, there is a high likelihood of anchoring bias that can lead to group think. This can make us blind to important risk factors.

To counter anchoring bias in ERM, enable and encourage independent input to stimulate the diversity of ideas essential for getting a full 360° view of risks, and properly weighing potential options for handling risks. Enabling anonymous input can reduce the fear of raising views that differ from the leader's perspective. For example, at Risk Wise Inc., we have used the Pownoodle platform with our clients to enable executives to anonymously share their perspectives on enterprise risks. The resulting uptick in confidence in risk analysis is striking. For example, Exhibit 1 shows a 44 per cent increase in confidence in the executive leadership team's shared understanding of the company's principal risks.

Exhibit 1

The Benefit of Ensuring All Voices Are Heard

How confident are you that this team has a shared understanding about the company's principle risks?



Source: Risk Wise Inc.

- **What You See Is All There Is (WYSIATI)**— is the tendency to draw a conclusion based on incomplete, but handy, data. The WYSIATI bias causes us to focus on facts and experiences that we can recall easily. Kahneman asserts, “When information is scarce, which is a common occurrence, System 1 operates as a machine for jumping to conclusions.”¹³

To counter the WYSIATI bias in ERM, ask, “What info do I need to evaluate this risk?” Then, seek data to examine the past (e.g., by looking into your records to get beyond what you happen to recall) and to explore the future (e.g., by asking, “Which shifts in our environment could cause this risk—upside and downside—to spike or plummet in the future?”).

- **Confirmation bias** is the tendency to both favour information that confirms one's beliefs and to discount information that contradicts one's beliefs. Confirmation bias can cause us to ignore evidence about changes in our risk landscape. As a result, we can completely miss signals that known risks are increasing or that new risks are brewing.

To counter the confirmation bias in ERM, first identify your assumptions by asking yourself: “What would be required for this belief to be true, or for this estimate to be correct, or for this risk management choice to be the best option?” Then reality test your assumptions by asking: “Do these conditions actually exist?” You can also summon the devil's advocate by having one person on the team in charge of asking tough questions and ensuring that alternative views are explored.

3. Our Brains Are Distracted

Cool Neuroscience Fact

Only 50 out of the 10,000,000 bits the brain processes every second are devoted to conscious thought. This means that the most we can dedicate to conscious System 2 thinking is 50 bits per second. The other 9,999,950 bits of our brain's processing power is System 1 thinking—i.e., the vast majority of our brain activity happens on autopilot. Being on autopilot means we are wired for inattention and inertia.

Because our conscious attention is incredibly scarce, we tend to focus those 50 bits on things that are either pressing or pleasurable. This sets up our brains to be distracted. Furthermore, our System 1 autopilot tilts toward protection and safety. Five times every second, our System 1 brain is deciding if it's sensing a threat or reward. System 1 is designed to minimize danger and maximize reward. However, for System 1, threat is faster-acting, stronger, and longer-lasting than reward. This means that, for the brain, *bad* (a threat) is stronger than *good* (a reward). This can be even more extreme when we're tired or overworked. When people feel vulnerable, they focus much more heavily on negative possibilities than positive ones.

When our System 2 brain is distracted, we'll default to System 1.

Implication for Risk Management

Our distracted brain can affect ERM in a couple of important ways. First, if we don't focus enough of our scarce attention on risk, we may unnecessarily expose the organization to losses. Second, when our System 2 brain is distracted, we'll default to System 1, which has a strong desire for safety. This propensity toward risk aversion can be an impediment to the balanced risk-taking required to exploit opportunities. For example, if we are overly cautious, we may forgo important opportunities to advance our organization's mission. Robert Mittelstaedt has written compellingly on why taking no risk can be the most dangerous mistake an organization can make.¹⁴ David Apgar puts it another way: "A diet of pure risk aversion likely will lead to extinction."¹⁵

A Strategy to Counterbalance the Effect of Our Distracted Brains

Use "fifty bits design" to ensure decision processes support balanced risk-taking.

Nease explains that "fifty bits design" is a deliberate re-engineering of decision processes to address the fundamental processing limitation of our System 2 conscious minds.¹⁶ The fifty bits design philosophy doesn't try to change people's underlying intentions. Instead, it attempts to activate pre-existing intentions to do the right thing.

I've used a couple of Nease's fifty bits design strategies to help my clients make it easy for their people to make the "right" choices when it comes to selecting risk management strategies that optimally align risk exposures with the organization's desired risk appetite and tolerance. These two strategies are:

- **Reframe the Choices**—set the framework that people use to think about and react to options;
- **Get in the Flow**—go to where people's attention is likely to be naturally.¹⁷

The fifty bits design strategy, Reframe the Choices, is about providing our brain some cues to help us know where to focus our precious fifty bits of attention (i.e., what to pay attention to and what to ignore, what is good, and what is bad). How an issue is framed matters. For example, if you had to make a choice about treating a serious medical condition, you might make a very different decision if you were told that "the odds of survival one month after surgery are 95 per cent" versus "one in every 20 patients die within one month of surgery." Yet, both those two framings reflect identical situations from a statistical perspective. The only difference is that the first is framed around the upside (survival), whereas the second is framed around the downside (death). This demonstrates the power of framing in decision-making.



A common framing error, which occurs when organizations are in their early stages of the ERM journey, stems from the tendency to adopt a traditional, defensive posture to risk management. This defensive stance focuses all attention on minimizing the downside of risk (i.e., decisions are framed around preventing and mitigating the destruction of value). An exclusively defensive stance to ERM will be just as limiting as one in competitive sports. If all you do is play defence and completely focus on preventing your opponent from scoring against you, the best result you can hope for is a tie (score of 0 to 0). To play to win, you need to also play offence. And, when it comes to ERM in organizations, that means deliberately taking on downside risk to open up the potential to create value and exploit upside risks.

The classic defensive approach to risk management (i.e., focused on reducing downside risk with little or no consideration of the potential for upside risk) reinforces a mindset of risk aversion. This may be entirely appropriate for an organization whose primary mandate is stewardship and value preservation, such as a safety organization. However, organizations that exist to generate value (whether that is a financial return, or public or societal good) for stakeholders need to master a more offensive approach to risk management.

A driving analogy, which likens the defensive stance to the brakes on a car and the offensive stance to the accelerator, is often used to explain how to balance the two stances of risk management. An organization needs the ability to both accelerate (take on risk) and brake (limit risks) as it navigates a course to achieving its goals and strategic objectives. As organizations mature in their ERM practices, they typically add an offensive posture to enable risk-taking that exploits the potential upside of risk. This allows them to reframe ERM decisions around striking a balance between taking risks to enable value creation and gains and managing risks to limit value destruction and losses.

Reframing ERM decision-making to consider both downside risk and upside risk recognizes that organizations don't take on downside risks for the sake of it. Rather, they decide to pursue those strategies and initiatives that will help them advance their mission and achieve their objectives in a way that strikes an appropriate balance between the associated downside and upside risks (i.e., they align the organization's risk exposures with its desired risk appetite).

Defining risk appetite is more complex and nuanced than selecting a simple threshold of risk magnitude that separates acceptable risks from unacceptable risks. It involves articulating the organization's values—both what is important to the organization and what it is willing to put on the line to achieve it. Now let's turn to the fifty bits design strategy that will help to implement ERM and a risk appetite framework: Get in the Flow.

The philosophy behind the Get in the Flow strategy is, if we can't get our fifty bits of conscious processing to direct our attention to risk, then let's flip things around and put risk where we know our fifty bits is likely to be. Nease explains that "if you've ever left a note on the fridge for a family member (or one for yourself on the bathroom mirror), attached a sticky note to a co-worker's computer monitor, or put a document on her chair, then you've used this fifty bits design strategy."¹⁸

There are three steps to implementing this strategy: finding the flow, inserting a cue, and making it easy to act on the cue.

1. The first step of finding the flow involves identifying where a decision-maker's attention is naturally focused. In the case of decisions involving the principal risks of an organization, there is normally a decision analysis and approval process that will capture the attention of the decision-maker.
2. The second step is to insert a cue or reminder to overcome inattention. I find the most powerful reminder to consider risk is a question or two from the person with the authority to approve or reject the decision or from the decision-maker's peers on the executive team. Examples of questions that make good ERM cues are: "Which downside risks are associated with this option?" and "Which upside risks will we obtain or forgo if we proceed with this option?" The first question ensures that potential threats and losses are considered and the second question ensures that potential upside opportunities and gains are part of the deliberations. When decision-analysts or decision-makers know that they will be asked these questions as a matter of course, they will begin to prepare for them and that helps to embed ERM into the organization's culture. A myriad of other questions can be used to stimulate healthy ERM dialogue. For example: "Is our management of this risk adequate?"; "Who might have a different perspective on this issue?"; "Which changes in our business environment could affect our exposure to threats or opportunities?"
3. The third step to implement the Get in the Flow strategy is to make it easy to act on the cue. In the absence of an explicit risk appetite statement, people are left to guess what the organization's target risk appetite is. This makes it difficult for them to gauge how well a decision aligns with the organization's risk appetite and tolerance. To make it easy for people to weigh risks appropriately, provide a risk appetite framework and explicit targets and threshold.

I've often been quoted for quipping "risk management is a contact sport." That's a pithy way of saying the goal of risk management isn't reporting. Rather, risk management is about helping your people make the right risk management choices. This requires engaging in dialogue with your people and supporting healthy risk conversations between your people. Effective risk management is critically dependent on the human factor. I hope the neuroscience concepts and strategies shared in this article will inspire readers to enhance the way the human factor is handled in their organization's ERM program and practices. 🌐



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