Improving decision making in crisis

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Received (in revised form): 15th July, 2013

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ABSTRACT
The most critical activity during emergencies or crises is making decisions about what to do next. This paper provides insights into the challenges that people face in making decisions at any time, but particularly during emergencies and crises. It also introduces the reader to the concept of different sense-making/decision-making domains, the human behaviours that can adversely affect decision making — decision derailers — and ways in which emergency responders can leverage this knowledge to make better decisions. While the literature on decision making is extensive, this paper is focused on those aspects that apply particularly to decision making in emergencies or times of crisis.

Keywords: decision making, decision derailers, crisis decision making, sense making, Cynefin, OODA Loop

INTRODUCTION
A survey of business executives by global consulting and auditing firm KPMG found that only one-fifth of all merger and acquisition decisions made in pursuit of corporate goals actually achieve the intended results.¹ This is alarming information as those decisions are made with all of the company’s resources available and under little to no time pressure. If four-fifths of corporate decisions made during normal operations turn out poorly, what is the likelihood that decisions made under the pressure of a crisis will achieve positive results?

This paper will explore decision making, particularly in times of crisis, focusing on how human tendencies can degrade decision making. It will also cover how decision making should be approached in various sense-making/decision-making environments.

THE BELIEF
Back in 1776, Adam Smith asserted that people make economic choices in a rational manner.² This assertion has been captured in the concept of the Homo Economicus, which evolved from unknown
authors in the 19th century: the rational economic human who makes all economic decisions based on a logical trade-off between cost and value. People believe that they make all their decisions in a logical and rational manner. Further, they act on those decisions with the belief that their decisions will achieve the intended results.

THE REALITY

The fact is that most decisions that humans make are not based on either rigorous logic or detailed analysis. What logic would drive a man to spend $60,000 for a car with terrible petrol consumption, no passenger room, no boot, no entertainment system, no outside door handles and no top (the Dodge Viper)? Why do people insist that a premium brand of vodka tastes better when multiple double-blind tests consistently show otherwise?

In Predictably Irrational, Duke University psychologist Dan Ariely exposes the fallacy of this belief in people’s rational decision making. In his research, Ariely demonstrates that people are subject to innate behaviours that bias decision making. In addition, these biases or behaviours are consistent and predictable. Humans behave in predictable, but not always rational, ways.

In Thinking, Fast and Slow, Nobel laureate Daniel Kahneman, discusses the two principal decision-making approaches. Kahneman calls these approaches ‘system 1’ and ‘system 2’. System 1 is the intuitive approach to decision making. System 2 is the cognitive approach: analytic, structured and disciplined. System 2 thinking requires significantly more effort than system 1 thinking, and, as Kahneman observes, people are cognitively lazy.

People accept the easy, intuitive decision (system 1 decision making) unless compelled in some way to use the cognitive approach (system 2). Such compulsion can be provided by something as simple as the need to compute an arithmetic product or the need to understand a very unfamiliar situation. Most of the time, intuitive decision making is both effective and efficient. Kahneman points out that relying on system 1 thinking when the problem is not amenable to an intuitive approach is both common and dangerous. Intuitive decision making is potentially an extremely useful approach in crisis decision making, but only when that intuition has been trained through long experience or repeated exercises. Kahneman and other academics have repeatedly stressed the need for training and experience to support system 1 thinking.

Dr Scott Page, Professor of Complex Systems, Political Science and Economics at the University of Michigan has published a great deal of research on the value of diversity of thought (cognitive diversity). His book, The Difference — How the Power of Diversity Creates Better Groups, Firms, Schools and Societies, discusses how disciplined group decision making consistently outperforms individual decision making. Much of that ‘outperformance’ is the result of behaviours that mitigate the tendencies identified by Ariely and Kahneman.

While much additional research has been conducted and is available, the research done by Kahneman, Ariely and Page describes human behaviour applicable to decision making and decision-making issues comprehensively and understandably. They provide the basis to improve decision making — leveraging the positive aspects of human behaviour and mitigating the pathologies.

THE CHALLENGE

While Kahneman, Page and Ariely provide insights to help people improve their decision making, they also illuminate the
challenges. At the most basic level, there are two reasons for ineffective or poor decisions — inappropriate approaches to decision making and/or decision-making processes warped by biases and decision-making pathologies, which will be discussed in more detail below. Inappropriate approaches include the lack of a systematic decision-making process, the application of intuitive decision making to non-intuitive problems and the application of cognitive decision-making techniques that are ill suited to the situation. These challenges arise from fundamental human psychology and cannot be overcome without effort. As the cartoon character Pogo observed 40 years ago: ‘We have met the enemy and he is us’.6

CHARACTERISTICS OF EFFECTIVE DECISIONS
Effective decisions possess two characteristics: timeliness and quality:

• **Timeliness**: an effective decision is one made at a time when its execution is most likely to achieve the intended results. A decision made and executed at the right time can be extraordinarily effective. For example, Apple’s decision to market the original iMac without a floppy drive was viewed by much of the IT world as a rash decision — one that would limit the utility and adoption of the computer. Now, Apple’s decision appears prescient. Floppy drives and buggy whips can be found only in antique stores while connectivity to the internet is the *sine qua non* for computers. Apple’s decision was made at precisely the right time and, quite possibly, accelerated use of the internet.

• **Quality**: an effective decision is one that achieves, in part or completely, the intended aim of the decision maker. Without a crystal ball, decision makers cannot know that a decision will be a quality decision. They can follow a disciplined decision-making process, using all the information available within their decision timeline, with awareness of human behaviour and understanding of the sense-making/decision-making environment within which they are operating at the time. If decision makers follow that kind of disciplined process, they will improve their probability of achieving a quality decision.

IMPROVING DECISION MAKING — THE FOUNDATION
Making decisions, like everything else humans do, can be improved by following a repeatable process. The process can be as simple or complicated as the decision maker chooses. There have been many different decision-making processes published, yet they are remarkably similar in their basic elements. For this paper, the classic OODA Loop,7 created by USAF Colonel John Boyd, will be used and referenced (Figure 1).

Using the OODA Loop model, decision makers:

• collect all relevant information available within their decision time horizon in as thorough and disciplined a manner as is practicable (observe);
• use that information to establish and maintain as complete an understanding as practical of the situation as it exists (orient);
• make the decision using appropriate techniques (decide);
• execute the decision at the correct time (act);
• monitor the results of decision execution (observe — essentially looping back to the information-collection step above).

Even with a repeatable process, such as the
OODA Loop, decision makers need to understand and account for the different sense-making/decision-making environments within which human beings work, decide and act. These different environments demand different approaches to making effective decisions.

David Snowden and his collaborators, notably Max Boisot, have created the Cynefin (Welsh, pronounced kū-nēv-īn) Sense-making Framework (Figure 2). This framework provides a very useful model for understanding differences in the increasing levels of uncertainty and complexity in human interactions.

Snowden and his collaborators developed the Cynefin Framework over several years. While it does not appear to be ‘rocket science’, the framework captures concepts and ideas that fall outside mainstream thinking. Understanding and applying the insights captured in the framework requires focused cognitive effort. This understanding must be achieved long before decisions need to be made. It is particularly important for emergency response and crisis management teams to have an intimate understanding of the concepts and the framework. It must become second nature so that responses appropriate to the situation are quick and effortless. The time to learn to swim is not when the ship is sinking.

The four primary Cynefin domains are:

• **Simple**: the domain in which the situation is easily observed and understood. Activity in this domain is stable and within universal constraints. Solutions are self-evident. The approach to sense making/decision making, in Snowden’s terms, is to sense, categorise and respond (OODA: observe; orient; decide; act). This is an ‘ordered’ domain and best practices are highly effective. Best practices are those practices that have been proven effective within a known, stable and recognised set of circumstances.

• **Complicated**: the domain in which the situation is obscured and can be understood only through the collection and analysis of data or the application of expert knowledge. Like the simple domain, this is an ordered area — largely dominated by physical laws. Activity in this domain is stable and predictable within constraints, being influenced by ‘known unknowns’, which means that a factor or influence can be identified (known), but its importance or characteristics are not understood (unknowns). The approach to sense making/decision making, in Snowden’s terms, is to sense, analyse and respond (OODA). This is an ‘ordered’ domain, but ‘best practices’ should be replaced by ‘good practices’. Good practices are based on ‘best practices’, but are tailored to fit the situation as revealed by expert knowledge or analy-
ysis of the actual circumstances being encountered. Reflexive application of best practices may have some positive effective but is likely to be suboptimal.

An example of activity in the complicated domain is the engineering design of a new building. Design information is available, but its exact nature must be sought out through gathering data at the proposed site or testing the proposed building materials and then analysing all data. Decisions in this domain should be based on analysis, expert knowledge and experience.

• **Complex**: the domain in which the situation cannot be well understood, perhaps not even after the fact. This is the domain in which two or more complex adaptive systems interact dynamically, continually changing the situation in unforeseeable ways. Activity in this domain is influenced by ‘unknown unknowns’ (factors and characteristics that are not recognised or understood as affecting the dynamics of the activity) and subject to unpredicted changes or flux. The approach to sense making/decision making here, in Snowden’s terms, is to probe, sense and respond (OODA: act (controlled small-scale action to learn), to accomplish an end).

In this domain, the OODA Loop is ‘entered’ at the act phase (probe) because the situation is not understood and must be learned through initial ‘probing’ action. Experiment — try something, see what happens and learn from it. The results of the action are observed and incorporated into decision makers’ understanding. Then, they decide and act. This final action is not the initial probing action, but a specific action based on what was learned from the probing action. The complex domain is an ‘unordered’ domain; best practices and expert knowledge may both be counterproductive and emergent practices are most appropriate. Emergent practices are those practices that are discovered to work in the specific and unique situation being experi-
enced. They may or may not correlate with practices previously applied. Intuitive decisions are very risky in the complex domain unless they are subject to review and amendment by focused cognitive (system 2) effort.

An example of activity in the complex domain is a college or professional basketball game. Information is available, but not all the information that players need. Observing the situation does not predict what the situation will be in the next moment. Each subsequent situation is created through an extremely rapid series of interactions by two or more players. Decisions are made or based on knowledge and experience as tailored by the ‘try something and if it works, try it again’ theory. Players, after a game, asked about their decision-making process during a particular play, have been completely unable to describe how they arrived at their ultimate decision for that play.

• Chaotic: the domain in which the situation is beyond previous experience and not comprehensible. Activity in this domain is influenced by ‘unknowable unknowns’ (unrecognisable factors that affect the evolution of the activity) with no evidence of constraints. It is highly turbulent. The approach, in Snowden’s terms, is to act, sense and respond (OODA).

In the chaotic domain, as in the complicated domain, the OODA Loop is ‘entered’ at the act phase and proceeds through observe, orient, decide and back to act. The difference between the chaotic and complicated domains is that the initial action in the chaotic domain is taken to stabilise the situation, not merely improve understanding of the situation. This is an ‘unordered’ domain and successive iterations of the OODA Loop should be rapid with the goal of stabilising the situation and moving into one of the other primary (and better-understood) domains.

An example is the chaos that existed immediately following the 9/11 attacks in Manhattan. Mayor Giuliani and emergency responders were faced with a completely unanticipated situation and their decisions were made in an effort to stabilise the situation. During chaos, novel practices may be more effective than best or good practices. Novel practices are those actions and behaviours that are new or newly applied to the current situation. Again, during 9/11, emergency responders applied best practices and entered the Twin Towers. Given the chaos of the situation, the intense fires and the inexperience with buildings of that height, some novel practices may have been more appropriate. These novel practices may have included limited helicopter evacuations and/or keeping emergency responders from entering the building pending consultation with civil engineers.

The fifth Cynefin domain, disorder, represents the situation that exists when decision makers do not know in which of the four primary domains they are operating.

LEVERAGING HUMAN STRENGTHS

With a repeatable process established and an understanding of the sense-making/decision-making domains developed, decision makers can apply inherent human strengths to improve the ‘observe’ and ‘decide’ steps of the OODA Loop. Two powerful strengths are cognitive diversity and critical thinking as they apply to the decision-making process.

In his research on cognitive diversity, Page observes that a decision maker is more likely to arrive at an effective decision when more people knowledgeably address the issue. Each person contributes
knowledge, information and problem-solving techniques from their own unique perspective. The blending or integration of these inputs can contribute to a more complete and accurate understanding of the problem, the sense-making domain, the surrounding circumstances and the various potential solutions (decisions). The more cognitively diverse the participants are, the more varied and effective will be their contributions. A decision-making group or team of ten identically thinking people provide no advantage over any single one of them. A group with diverse perspectives is more likely to recognise the risks in other members’ potential solutions. The additional information, perspectives and problem-solving techniques contributed by cognitively diverse participants can mitigate a range of decision-making pitfalls.

An equally important strength is critical thinking. Critical thinking — the application of Kahneman’s system 2 cognitive approach — necessitates asking the hard questions, demanding supporting data and information and testing logic and rationality. As stated earlier, Kahneman points out that humans prefer making decisions the easy way: the intuitive system 1 thinking. This kind of thinking can lead people into accepting a faulty course of action because it ‘sounds good’. Critical thinking can mitigate the tendency to accept a solution without subjecting it to meaningful analysis.

Cognitive diversity and critical thinking can easily create a ‘virtuous cycle’. Different perspectives and continuous critical examination of information and ideas ensure that more potential solutions will be considered during the decision-making process. The more solutions that are considered and examined, the more likely it is that the decision maker will find a good, even the best, solution. Taking advantage of these strengths is more difficult than simply acknowledging their existence. The decision maker must actively pursue cognitive diversity, encourage the application of that diversity and embrace critical thinking and its ‘hard questions’.

**MITIGATING THE DECISION DERAILERS**

Leveraging strengths to improve decision making is only the first part of addressing the challenges presented by people’s natural tendencies. A second part of addressing challenges faced by decision makers is understanding and mitigating human behavioural barriers to rational decision making. The authors’ research has identified over 20 of these influences, which have been categorised into five groups and titled: ‘decision derailers’.

When faced with the pressure of an emergency or crisis, decision makers are particularly susceptible to a subset of these derailers (see Figure 3), which are discussed below. Members of emergency response and crisis management teams who know and recognise these derailers are better positioned to avoid or mitigate them during a crisis.

These derailers fall into the groups described below:

**Altered perspectives**

The decision derailers in this group are influences that create an inaccurate understanding of the situation. There are three derailers in this category: framing; compelling stories; recent events.

**Framing**

During an emergency or crisis, decision makers are frequently faced with having to create an understanding or framing of the situation. That understanding derives from decision makers’ perspectives as they look at the situation. Decision makers must be very careful to consider different possible
‘frames’. Some frames are more useful than others, while some may be misleading. The challenge of choosing a useful frame is compounded by the highly questionable accuracy of much of the incoming initial information. In such a situation, decision makers need to defer their initial framing of the situation and at least temporarily maintain a number of plausible alternative framings of the situation. This must continue until enough mutually reinforcing information permits finalisation of a more accurate frame.

Deferring final framing is important, because framing the problem or situation inherently limits the set of possible responses. An inaccurate frame can easily lead decision makers into unproductive actions and may endanger recovery from the crisis. Kahneman and his collaborator Amos Tversky demonstrated the power of framing in the early 1970s when they posed an identical problem, framed in two different ways, to a series of paired groups. The different pairs, faced with two different frames of the same problem, consistently arrived at two different answers.8

**Compelling stories**

As with the tendency for people to prefer easy, intuitive solutions, compelling stories can bias human sense making/decision making and can derail decisions. People have the tendency to accept ‘good stories’ even if they are not true. A true story can be an even more powerful influence. Even a compelling, true story can result in a poor decision if the story is not highly analogous to the current situation. Quaker Oats Company bought Gatorade in a wildly successful acquisition. Based on that ‘story’, Quaker bought Snapple several years later, expecting the same remarkable returns. Quaker later sold Snapple at a loss of over $1bn.

**Recent events**

It is human nature to look at past experience to help make decisions. Recent events have greater weight, especially in a crisis situation, because they are fresh in people’s minds. If decision makers resist that natural bias, they may find events further in the past that are more relevant to the current decision that needs to be made.

**Organisational speed bumps**

These decision derrailers are cultural or bureaucratic tendencies that limit or constrain consideration of options. Two particular derrailers in this category should be of concern in emergency or crisis situations: excessive optimism and overconfidence.
While these biases may seem to be nearly the same, they differ in their manifestation.

**Excessive optimism**
This derailer derives from an individual or team sense that the decisions or chosen actions will succeed. Excessive optimism can lead a team to make successive decisions without thorough consideration of new information. It can also lead a team to reject problems inherent in their chosen course of action. Either of these manifestations may reinforce or be reinforced by other derailleurs, compounding problems facing decision makers.

**Overconfidence**
This bias manifests itself through an unshakeable belief that decision makers can effectively respond to the emergency or crisis without full consideration of the situation.

**Frequently**
Overconfidence leads teams to defer action in the belief that the situation is already ‘under control’.

**Appeal to authority**
These decision derailleurs address the tendency to look to the boss, team leader or other authority before making a decision or taking action. There are two derailleurs in this category: sunflower reflex and champion bias.

**Sunflower reflex**
This derailer is the tendency of people to overtly or subconsciously ask the question ‘What would the boss do?’ before making the decision themselves. This sunflower reflex is a function of organisational authority and is particularly prevalent in organisations with a strong, directive leader. As the boss is frequently not available during crisis situations and more frequently not in a position to understand the unfolding situation, this behaviour can lead to very poor decisions or, at a minimum, delay needed actions.

**Champion bias**
This derailer is the human tendency to uncritically accept the decisions of someone who has been extremely successful in the past. While past success can be an indicator of good judgment, unless that success is directly applicable to the current crisis situation, it can also result in poor decisions or lost time.

**Resistance**
The decision derailleurs in this category highlight a reluctance to move away from a predetermined course of action or to change tactics. Three derailleurs in this category can cripple emergency or crisis response: escalating commitment, anchoring; loss aversion.

**Escalating commitment**
This derailer is more widely recognised as an attitude of ‘If we try just a little harder …’ It is the reluctance to accept that a previous decision and subsequent course of action are not achieving the intended goal. The decision makers’ sense is that more resources are all that is needed to correct the failing course of action. Escalating commitment can be particularly dangerous as it steals time and resources from more fruitful courses of action.

**Anchoring**
In a decision–making situation, the tendency to irrationally commit to the first number, piece of information, decision or solution is called anchoring. As with framing the situation, prematurely defining a decision or solution can inadvertently create an anchor that precludes consideration of the full range of options. Research has shown that decision makers seldom move very far away from an anchor.
**Loss aversion**

This derailer is the tendency to ‘feel the pain’ of a potential loss much more acutely than the benefit of an equivalent potential gain. For decision makers in a crisis or emergency, loss aversion manifests itself as the inclination to defer decisions or actions because of the risk of failure.

**Information pathologies**

These decision derailers highlight the tendency to unconsciously misuse information, either too selectively or too broadly. There are four derailers in this category and any of them can bias decision making. They are confirmation bias, information bias, what you see is all there is (WYSIATI) and failure to communicate.

**Confirmation bias**

This derailer is the tendency to search for or accept only that information that confirms a pre-existing perspective or decision. Obviously, ignoring or rejecting disconfirming information can easily result in an erroneous understanding of the situation and may lead to bad decisions.

**Information bias**

The tendency to continually demand more and more information, often ignoring the criticality of timely action, is called information bias. While there is always more information to be had, the time and cost required to gather and assimilate that information increases significantly past some limit. This bias can result in decisions that are too late or in decisions that are out of sync with the evolving situation.

**WYSIATI**

Kahneman identified this phenomenon and calls it WYSIATI — the human tendency to consider only the data and information that are ‘in the room’ when making decisions. Decision makers use the information that is ‘visible’ and do not even acknowledge the existence of information that is not ‘visible’. WYSIATI is a serious concern in crisis situations because time pressure reinforces the tendency to use only the information that is immediately and obviously available.

**Failure to communicate**

This decision derailer is the tendency to withhold potentially important information because it does not agree with the team or the decision maker’s position, does not seem important or the individual with the information does not feel empowered to raise it. In any of these situations, failure to communicate denies decision makers information that could inform their understanding of the situation.

**MITIGATING ACTIONS**

During times of normal operations, decision derailers can be individually recognised and mitigated through measured actions. In emergency and crisis situations, for both emergency response and crisis management teams, time is the enemy and mitigation techniques have to be applied with a broad brush. Fortunately, leveraging human cognitive strengths combined with a few simple mitigating actions can reduce the impact of decision derailers during crises. Some recommendations are listed below:

* Take advantage of cognitive diversity. Different people bring various perspectives to sense making and decision making. Those differences can contribute to significantly improved decision making if leveraged. Leveraging cognitive diversity requires commitment to an agreed-upon goal but complete openness to achieving that goal. This openness requires decision makers and leaders to openly and vigorously embrace different information, knowledge, perspectives and options.
• **Commit to critical thinking.** Like cognitive diversity, the application of critical thinking generates significantly improved decision making. Asking the hard questions and demanding more than just a compelling story or analogy is imperative in critical thinking.

• **Learn to recognise and understand the decision derailers.** Dysfunctional tendencies and biases can be corrected, but those tendencies/biases, together with the associated mitigating techniques, must be recognised and acted on by the decision makers.

• **Do not commit to information or decisions before necessary.** While timeliness in emergency or crisis situations is critical to effective response, acting prematurely can create a secondary emergency or crisis. It is vitally important that decision makers understand the quality of the information on which they are basing their decisions and deferring decisions until they have the best practical information.

• **Conversely, do not delay decisions beyond the decision time horizon.** While it is vital to delay decisions as long as practical to ensure the quality of the informational foundations of those decisions, it is equally important not to delay any longer than necessary. A good decision ‘in time’ is much better than a ‘perfect decision’ made and executed too late.

• **Identify the largest number of options practical.** By considering a large number of options, decision makers are taking the opportunity to allow the evolving situation to indicate the best options. A narrow set of options may lead to not considering the most effective course of action.

• **Keep options open as long as practicable.** As with delaying decisions, keeping options open as long as practical helps decision makers avoid premature commitment to a course of action that may be suboptimal or even counterproductive.

• **Revisit decisions as often as the evolving situation indicates.** Given the inaccuracy of much information in emergency and crisis situations, decision makers need to be prepared to shift courses of action with the changing situation. They need to be prepared to ‘be wrong’ and take action to make corrections. Making those changes requires that decision makers continually review past decisions and monitor the progress (or lack of progress) resulting from those decisions.

**HONING THE SKILLS**

Once a decision maker or decision-making team understands decision making, there remains one more critical activity that can yield a major improvement in decision making during crisis. That activity is practice.

With a repeatable decision-making process in place, that process should be practised under a wide range of simulated situations. Such simulations, and the subsequent analysis of the results, ‘prepare the minds’ of the decision makers. Practice provides them with the experience to more rapidly and easily make timely and effective decisions during actual crises and emergencies.

**CONCLUSION**

Improved decision making in crisis or emergency situations is achievable through a relatively small set of focused actions:

• Implement a repeatable decision-making process.

• Understand the sense-making/Decision-making domains.

• Understand how inherent human cognitive strengths can be leveraged.

• Understand how inherent human cog-
nitive biases (decision derailers) can be identified and mitigated.

- Practise crisis decision making through simulations and exercises.

Emergencies and crises are unavoidable aspects of life, but they can be made less disruptive if emergency response and crisis management team members understand how to make decisions, what behaviours diminish the effectiveness of their decisions, and how to mitigate those behaviours — under the pressure of a threatening event.

REFERENCES


