SELECTING AN EFFECTIVE COURSE OF ACTION – ANALYZING CONSEQUENCES AND OUTCOMES IN ASSESSING DECISION OPTIONS

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Abstract:

Over recent years research and practice in emergency and crisis management have evolved interests that emphasize resilience, sustainability, and leadership. Within decision making, crisis and emergency research and practice parallels mainstream decision making interests – confidence and biases in judgement and contextual and situational variables – and considers decision maps of the cognitive process and situational awareness. The ability to manage effectively within emergency and crisis situations, however, remains of primary importance as we are unlikely to eliminate emergencies and crisis situations.

Recent research and thinking in mainstream and crisis and emergency decision making moved into mapping and replicating "good" judgement. Recognition Primed Decision making (Klein, 1996), for example, tries to use experienced-based learning to promote situation assessment, evaluation of options, and elaboration of these options. The Method of Tactical Reasoning (Pandele, 1995) makes a similar effort with its use of five stages of processing – information search, analysis and anticipation of information based on current and future states, identifying tasks, time management, and elaboration options or intentions to act. Underscoring such efforts is a need for a process to do so across situations, as outlined in **_FAST_** © (Heath, 2001). Fundamental to these, however, is an ability to effectively assess options.

This paper and workshop introduces a fundamental method for evaluating options (or choices), outcomes and consequences. Options are examined in terms of management ability to directly manage options and the capacity of the managing team to manage the situation. Options are then assessed in terms of applicability to the situation, identifying factors or changes in the situation that measure the interaction of choice and situation in terms of whether the choice is working, and wanted and unwanted consequences and outcomes. This assessment includes validity, framing, and management of the consequences (both wanted and unwanted). Through this process the future outcomes and consequences can be probed and the best set of outcomes and consequences can be identified. This then enables more effective evaluation and choice of options. Decisions can thus be made with more rigorous foresight rather than discovered to be less than optimal by hindsight.

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1. Introduction

Trying to select the best option or action choice becomes increasingly important when the decision environment has limited (or appears to have limited) time in which to act, missing or uncertain information, a threat to humans or resources valued by humans, and /or a demand on resources that exceeds the resources available with which to manage. These factors broadly define crisis and emergency situations (Heath, 1998). Consequently we need to continue to improve our capability to think and decide during our interaction with crisis and emergency situations.

Recent approaches that consider effective decision making in emergency and crisis decisions reflect or launch from parallel interests and findings found in the mainstream decision research domain. These approaches have moved from broad cognitive perspectives (such as Recognition-Primed Decision making) to more specific applications (such as Pandele's Methode Tactique). These need to be seen against the broader streams of decision making and against the emergent interests in crisis, disaster and emergency management practice and research.

2. Mainstream Decision Making Research and Emergency and Crisis Management Decision Making

Over the last sixty years research into decision making explored confidence in judgement, decision mapping, normative and subjective models, and aspects within the decision maker and the decision environment that may influence judgement and choice. Aspects included exactingness (Hogarth, Gibbs, Mackenzie, & Marquis, 1991) cue relevance and situation context (Schwartz & Norman, 1989). Exactingness is the degree to which a variable reflects the severity of penalties for poor judgement. Cue relevance considers the degree to which a cue is perceived by decision makers as being contributory to making a specific decision. Situation context includes aspects of the decision maker (attention, memory, and knowledge), type of judgement required (evaluation, choice, and prediction), and task specific factors.

Research also focussed on sources of decisional and confidence bias (Fischhoff, 1975, 1982; Kahneman & Tversky, 1973; Paese & Sniezek, 1991). Decision processing included investment in an industrial plant (Sterman, 1989) medical decision making (Kleinmuntz & Thomas, 1987) and general business simulations that contrasted human and artificial decision teams (Hogarth & Makridakis, 1987).

3. Decision Making Research and Practice in Emergency and Crisis Management

Early research and practice in emergency and crisis decision making applied systems theory and adapted existing approaches (usually military or paramilitary) for use in community, industrial or business settings. This led to the development of common operational structures – from ICS (Incident Command Structures) and UCS (Unified Command Structures) to SEMS (Standardised Emergency Management Systems).

Current research places an emphasis on resilience, sustainability and mitigation. These interests draw on issues in psychological ecology (Reed, 1996), sustainable development (Robertson, 1999), and elements that support resilience (Buckle, Mars & Smale 2000). Other areas of interest include systems approaches for resilience (Paton, Johnston, Smith, & Millar, 2001), individuals and resilience and self efficacy (Lindell & Whitney, 2000) and coping with problems (Bachrach & Zautra, 1985). While such efforts are important in our efforts to reduce risk and threat, we need to consider that ultimately emergencies and crisis situations cannot be designed completely out of our environments. Consequently we need to continue an equal emphasis on how we lead and manage in emergency and management situations.

Some current research looks at types of leadership within the context of emergency and crisis

situations. In one example, Yates (1999), in contemplating the book on Intelligent Leadership by Mant (1997), considers leadership in terms of transactional and transformational characteristics. Transactional leadership is seen by both to be the art of building and maintaining transactions or relationships between people. Yates considers that leaders in emergency services are good transactional leaders. Transformational leadership is seen as complementary but different – where a situation is transformed or changed by a focus on desired outcomes. In essence, transformational leaders stand back and see systems in a whole of system or big picture. This is seen by Yates as a lesser characteristic in emergency management and admits a need for a fusion of both transactional and transformational leadership styles. Transformational leaders assess situations and the surrounding environments (including the response management environment) to develop situation awareness of a "big" picture and desired outcomes.

Parallel research explores remembered and recorded reconstructions and experience to develop mental models to handle critical problem and crisis situations. On the cognitive side, for example, Mitroff, Pearson & Harington (1996) suggest that organisations may be worse off if they substitute planning and/or "thinking on their feet" for actual competence in crisis management. Regester (1989) warns of the need to consider the worst case scenarios when managing in such situations. Interest turns to one of how to probe the situation and develop the decision process so that the user is neither locked in a speculative worst case scenario nor moved too readily to a dangerous underestimation of the problem or crisis. In turn, this suggests that decision makers need to assess situations – what can be termed *situation awareness* (Endsley, 1995) – and formulate effective tactical and strategic options.

Situation awareness either indirectly or directly forms part of many suggested approaches that include improving team interaction, especially when that team is likely to encounter problem or crisis situations. One such approach is Crew Resource Management [CRM] – also known as Cockpit Resource Management (see Weiner, Kanki, & Helmreich, 1993). CRM involves a combination of communication, self-knowledge, and focus skills to enhance behavioural interactions.

Recognition-Primed Decision making [RPD] (Klein, 1993) is an approach that reflects knowledge and experience. RPD looks at situation assessment, evaluation of options, and on the elaboration of (and improvement in) these options (Klein, 1993; Flin, 1996). Subjective determination models like RPD assume that consensual knowledge from "experts" produces a good satisficing outcome. A satisficing outcome is one that meets many *but not all* possible decision choice requirements – and seems acceptable ("satisfying") to the decision maker. However, more optimal choices can reduce likelihood of inquiries, litigation, and better outcomes and consequences.

Pandele (1995) offers an approach that appears to link situation awareness and problem or decision analysis in *Methode de Raissonnement Tactique* [Method of Tactical Reasoning – MTR]. MTR essentially outlines five stages of processing:
1. Search for information.
2. Analysis and anticipation of information based on current and future states.
3. Identification of tasks.
4. Management of time.
5. Elaboration of options for manoeuvre (the "intentions" of a fire sector leader).

These stages can be re-defined as find information, analyse information in terms of situation and what needs to be done, determine workable solutions. In this sense, the stages can underscore general decision making processes.

In ***FAST***, Heath (2001) outlines an approach that develops situation awareness and problem solving/decision making by identifying or developing sets of three options (plus a stated target or

goal) to produce a choice or option, an alternative to that choice, and a safety option. This process uses evaluation of options and perceived outcomes and consequences to improve choice selection and increase the ability to monitor, manage, and – if necessary – change to another option should the selected option no longer apply or begin to fail. This procedure is based on managing through choice, outcome and consequence analysis and enables us to:

- Consider the range of outcomes and consequences (wanted and unwanted) and determine how we may handle these *before* we interact with a situation, and,
- Develop the skills to consider the range of outcomes and consequences (wanted and unwanted) and determine how we may handle these while working in a situation.

In the workshop we will focus on developing the basic evaluation skills that link consequence, outcome, and choice.

4. The Stimulating Situation

For a central and common focus we will use a very visible emergency – an aircraft crash on an urban (city) environment. We can choose between:
1. The destruction of the World Trade Centre by terrorist action (crashing two large highjacked commercial passenger aircraft into the towers), or,
2. Views of a table top simulation of a commercial jet aircraft crashing into a near-harbour area of a city (due to structural failure involving a tail mounted engine).

We can further determine our "stake" in the process – by group consent (if working in a group). Stakes can include responder organisations (police, fire service, paramedic), business organisations (within impact site, adjacent to impact site, potentially affected by impacts), or associated or involved agencies (government, local government, hospitals, schools).

If there is time we will look at first impact, during and recovery moments for this scenario, and we will also try to determine options and evaluate those options for a stakeholder from an organisation that is different from ours. This last activity is worth doing even if we cannot fit it within this workshop. We can see outcomes and consequences for others. This helps us manage in such situations and plan our own actions more effectively.

5. Developing Choice or Option, Outcome and Consequence Evaluation Skills.

We will try a taste of doing this process before working at a more systematic pace.

1. On the next page write down what organisation and organisational position you choose.

2. Without too much thought or discussion determine the first choice or option you would do.

Most times you will find that your brief statement is a "what to do" type statement. This is a goal or target statement. This statement can be divided into sub-goals by looking at who does it and where it is done, and even when it is done. We usually gain multiple options when we outline "how" it can be done. So let us check whether we have a "how to" part to our statement (and add one if we do not have one present).

3. In the next space, note any other "how-to" options or choices that can achieve the target.

4. Once this is done, choose the option that seems best.

This choice is likely to be largely influenced by a heuristic or rule-of-thumb, like "cheapest", "easiest to do", "best meets the situation as I see it", or "quickest course to the goal or target".

5. Have a look at the outcomes. Do other "good" outcomes exist? Are there any "bad" outcomes? What could go wrong while/when we attempt this course of action? Can we manage those

"wrong" or "bad" situations? How? Notice more outcome-driven options emerge here. What are the consequences for each of these outcomes – for each stakeholder group and for the organisations involved? Can we manage these effectively?

Choice/Option Analysis

1. **POV:**

2. **Option**

3. **Other "how-to" options for the above choice:**

4. **Clearly indicate the "option you (the group) would choose to use".**

5. **Identify *all possible* outcomes – good and bad – including what goes right or wrong while we undertake the choice.**

6. **Indicate with a tick each of these good and bad outcomes that can be *directly* managed.**

7. **Identify *all possible* consequences – good and bad – (1) for you and your organisation, and, (2) for other stakeholders (employees, customers, and so on).**

8. **Indicate which of these we can we effectively manage with a tick.**

9. **Do the same for your other options. Is your choice still the one you would choose?**

Now we can consider a more systematic approach to the twin process of evaluating and expanding the choices, outcomes and consequences.

We can choose:
* *to return to the previous choice domain,*

- *select another target and develop a set of choices from the immediate impact, or,*
- *select a target and develop a set of choices for the "during the situation" interaction.*

As before, we need to:

1. Identify the POV (organisation, your position, the situation context).

2. Identify the target goal (outcome).

3. Identify *all options* we can generate.

4. Do a quick "keep" or "drop" check of each option by looking at whether we can actually manage it and at whether our organisation has the capability to implement it:
- *Can we <u>directly</u> manage and implement this option strategy?* If yes, give the strategy a tick. If we believe we can strongly influence their management and implementation of the option, place a question mark on the option. If we cannot directly manage and implement or strongly influence the management and implementation of the option, place a cross against it and drop the option.
- *Has our organisation the capability to manage and implement the strategy*? Capability in this context means having the resources, training, and corporate "will" to manage. If the answer is yes, give the strategy or option a tick. If the answer is no, we may take a few minutes to consider whether we can fix this. If this is the case, put a question mark on the option. If the answer remains no, place a cross against the option and drop the option.

We now have options with two ticks, a tick and a question mark, or two question marks (having dropped any option with a cross). Options with two question marks can also be dropped where we have a lot of "good" options. Options with question marks may prove costly in time and effort to improve them. In some complex or difficult situations and environments, however, we may need to meet such costs. We may even need to change crossed-out options into ticked options.

Any option with a question mark means we need to spend more time making it workable. If we have a lot of double ticked options we may find we can ignore these "questioned" options as well, although we need to check them for quality of outcome and consequence in case these would be very good should we accept this effort and costs.

For this exercise, let us take all options with one or two ticks (and assume we can convert the question mark into a tick in the future).

Choice/Option Analysis

1.   **POV:**

2.   **Target:**

Options (how to):

Leave work space around each option you write down as you will be adding informational phrases to each option.

We now check that the options are applicable to the given impact situation. In planning and pre-situation mode, we do this across risks, threats, and impacts.

We do this by seeking factors or features in a situation (or possible situation) that clearly signal we can or should use the option. We also look for features or factors that signal "do not use this option". *Sometimes the "apply" or "reject" features or factors are the same. Sometimes these are different.*

1. **Have a look through the "ticked" options and establish some clear apply-reject factors or features***. Where we have found some apply-reject features or factors let us write the option and the apply-reject features or factors down.*

2. Next we need to assess the option and the (possible) situation to identify any factors or features that will tell us whether or not the implemented option is working and thus still applicable. These features or factors may be "measures" of decreasing or increasing impact damage, threat to people and resources, and/or reductions in the situation. **Look at the options and identify any factors or features that will tell us** *over the duration of the situation or duration of the implementation of the option* **whether that option is working or not working.** *These factors or features can differ from the apply-reject factors or features.*

We next need to assess the potential results of these in consequences and outcomes. To do this, select one of the options that have so far made it through the analysis (that is, can be managed or influenced, has apply-reject features, has factors or features that allow us to monitor success or failure during implementation). If we have time we will do this for other options and increase our practice with this process.

3. **Write out your (or the group) selected option, including pointers for apply-reject and ongoing performance evaluation**.

4. **Identify our desired outcomes, desired consequences, other positive outcomes and consequences, unwanted or bad outcomes, and unwanted or bad consequences**. We need to do this in terms of ourselves (and our organisation) and then in terms of others (and their organisations).

Outcome and Consequence Evaluation

Option plus apply-reject elements plus working-not working elements:

Desired outcomes

Desired consequences:

Other positive or beneficial outcomes and consequences:

Negative or unwanted outcomes

Negative or unwanted consequences:

We may need to check our thinking for assumptions, stereotypes, and bias. A useful check of our thinking is to ask ourselves:

How do we know this is so?

If we can point to facts and logical argument then the proposed results are possible. If we resort to expressions of wishes ("because it just has to end up like this!") or poorly thought through or stereotypic responses ("what else could happen", "that's the way I would act"), we are expressing potentially delusional thinking and assumptions.

Two further hints may also help:

1. *When thinking hard about an option, be very guarded about any statement that feels as if it has an exclamation mark at the end of the statement.*

2. *Ask "What if this is not the case?" and "What could happen if this does not occur?"*

"Desired" outcomes.   *We need to check that the desired outcomes are logical and expected given the situation, the option, and the interaction likely to arise when we implement the option.* Often, our desired outcomes and consequences can be based on wishful thinking and hope rather than a hard assessment of likely results.

If the desired results still seem "true" then tick the desired outcomes that seem true. In most cases we become more aware that the desired results can be achieved but other not-so-desired results are possible, so check that we have these not-so-desired results covered in the negative outcome list.

Should we find the desired outcomes are weak or need more support we place a question mark next to them.

If we find the desired outcomes do not stand up to scrutiny we place a cross against them – and the option shifts to a discard option decision. *If we are in planning and development mode (rather than in a situation) we may take the opportunity to rebuild, re-shape, or somehow modify the option so that the desired results are more certain or more likely and the negative results are eliminated or reduced in impact and/or likelihood.*

1. **We do the same for positive consequences (and again look at both "us" and "other" POVs)**

2. **We do the same for any other (peripheral) positive outcomes and consequences we may have identified.**

3. **We do the same for our lists of unwanted or bad outcomes and consequences.**

4. **Now we do a risk evaluation of these negative outcomes and negative consequences**. We look to see if we can eliminate or reduce them by altering the option or the way the option can be implemented. We then look at the reduced and left-over outcomes and consequences and look at how we could manage should these arise. *This is called contingency planning.*

5. We now look for features within the environment and/or situation that can signal the onset of the negative results and use these to trigger implementation of any such contingency plans.

Should we find that we **cannot** eliminate or reduce and manage any negative results we need to be very cautious about selecting the option to which these belong. *Where there are other options with no or fewer or lesser negative outcomes and consequences – and after we have looked at eliminating or reducing and managing any of the negative results but cannot do so – we discard the option.*

We have now sifted through our options and identified wanted and unwanted outcomes and consequences attached to the options.

Often the best option appears to be the one with the most desired and positive outcomes and consequences and the fewest unwanted or negative outcomes or consequences. Be careful. *There are options with wanted and unwanted outcomes and consequences that may be "best" because we can effectively manage the unwanted or negative outcomes and consequences.*

We may feel somewhat overwhelmed by the amount of thinking and work we have to do across all chains and all risk/threat situation and interactions. If we take the work a little at a time we will find it can be done (and even fun!). As we get experienced this evaluation process gets faster and can become almost semi-automatic.

6. Conclusion

This paper and workshop has indicated a trend toward, and a need for, greater situational evaluation and more systematic and detailed exploration of future states in terms of outcomes and consequences. By looking at how options may apply and may continue to apply, we establish a more effective implementation and a management approach that is more ready to change action-choices during a situation or decision implementation activity. By looking at the wanted and unwanted outcomes and the expected or unexpected responses or reactions (consequences) these outcomes elicit, we can choose better long-term options and make early preparations to handle positive and negative outcomes and consequences.

We have a basic Option Outcome Consequence Evaluation process:

1. **Situation or Component of Interaction and/or Situation:**

2. **Option or Choice:**

3. **Points indicating we can use this option in the interaction/situation:**

4. **Points indicating we need to reject this option in the interaction/situation:**

5. **Expected and wanted results (outcomes and consequences):**

6. **Indicators showing these expected and wanted results are emerging:**

7. **Indicators showing these expected and wanted results *are not* emerging:**

8. **Other possible peripheral positive outcomes and consequences:**

9. **Indicators showing whether these are emerging:**

10. **What we can do to take *advantage* of these as these emerge:**

11. **What we can do with any positive outcomes and/or consequences *after* these emerge:**

12. **Indicators that any peripheral possible positive results are not emerging:**

13. **Negative or unwanted results (outcomes and/or consequences):**

14. **Indicators that these unwanted outcomes and/or consequences are emerging:**

15. **Indicators that these unwanted outcomes and/or consequences are not emerging:**

16. What can we do to manage these <u>as these emerge</u>:

17. What can we do to manage these <u>*after* these emerge</u>:

18. What we need to do to implement this option:

This process provides a systematic way of not only identifying the most applicable or workable choice, but also the beginning of strategic future management of outcomes and consequences before these add impacts, risks, and costs.

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