Opening the Black Box: How Command Teams Sensemake

by **SLTC Lim Beng Chong, PhD**

Abstract:

Teams are an increasingly common feature of many organizations. In the Singapore Armed Forces (SAF), we create a variety of teams to carry out the many requirements of the organization. For example, we create and develop combat teams to perform the tactical actions required in combat and command teams at all levels to perform the critical function of command and control during operations. In peacetime, we create project teams and working committees to perform tasks that further enhance the SAF's organizational effectiveness in the areas of human resource and organizational structure optimization, technological development and implementation, and organizational culture and learning. The objective of this article is threefold. First, the concept of sensemaking is examined. Second, some of the pitfalls that may affect the quality of the collective sensemaking process are discussed. Finally, a number of recommendations to mitigate the effects of these pitfalls are proposed.

Keywords: Collective Sensemaking; Team Leadership; Problem Solving; Organizational Effectiveness

INTRODUCTION

> *"When a task is beyond the capability of an individual, organizations often rely on teams to work together to accomplish goals. Military command teams are a good example. The combined cognitive and behavioural capability of a team allows it to achieve goals that an individual probably cannot. However, simply putting a group of people together does not ensure they will operate as a team."*
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> *– COL Ong Yu Lin and LTC Lim Beng Chong, PhD*[1]

Teams are an increasingly common feature of many organizations. In the Singapore Armed Forces (SAF), we create a variety of teams to carry out the many requirements of the organization. For example, we create and develop combat teams to perform the tactical actions required in combat and command teams at all levels to perform the critical function of command and control of our forces in operations. In peacetime, we create project teams and working committees to perform tasks that further enhance the SAF's organizational effectiveness in the areas of human resource and organizational structure optimization, technological development and implementation, and organizational culture and learning.

Indeed, teams are critical to the success of many modern organizations. In particular, the effectiveness of organizations that operate constantly in complex, if not chaotic, situations is often determined by their combined cognitive and behavioural human capability.[2] Many large organizations today, especially those in the technology sector, are operating in an increasingly complex business environment. Likewise, many military organizations find that their battle space has evolved substantially. Their adversaries are no longer clearly defined. and what constitutes mission success is often vague and subject to change depending on the shifting socio-political and security environment. This is the new reality SAF commanders face today.

Like many successful organizations, the SAF has responded well to this new operating environment. Its responses include organizational renewal and restructuring, process reengineering, human resource optimization, technological renewal and acquisition, and the constant training and retraining of its people. In sum, the response is the Third Generation SAF.

To sustain its most important asset—its people—the SAF has to constantly recruit the best, provide the best training and development and continuously motivate its people to ensure that they contribute optimally to the organization. As such, over time, the SAF is able to develop groups of individuals who have expertise in the various functional areas critical to the functioning of the organization.

However, "simply putting a group of people (experts) together does not ensure they will operate as a team."[3] The next wave of substantial improvements to organizational performance will have to come from harnessing the multiplying effects of the cognitive and behavioural capabilities of these individual experts. In other words, how do we transform "teams of experts into expert teams" with the potential greater than the sum of their parts?[4] In short, how do we make sure that 1 + 1 > 2?

As highlighted in the earlier *POINTER* article by COL Ong and LTC Lim, there are perhaps at least ten key components that can potentially affect the performance of a team,[5] especially team decisions. The key components include five that belong in the cognitive domain (i.e., team mental models, team situational awareness, collective sensemaking, collective understanding of command intent, and leader's mental models) and five in the social domain (i.e., team self-correction, team communication, team orientation, mutual trust and team leadership).

This essay will focus on collective sensemaking for the following reasons:

1. Neither collective nor individual sensemaking has been well researched and it remains one of the least understood components that affect team performance.

2. Collective sensemaking is an important first step to team performance. Without having a good grasp of the situation, teams cannot make good decisions and act appropriately. How then does a team perform collective sensemaking? What are the factors that will affect the quality of the collective sensemaking process? How can we mitigate any negative effect? How can we ensure 1 + 1 > 2 in terms of collective sensemaking?

This essay will first examine the concept of sensemaking. Although the focus is at the team level, it will briefly discuss individual sensemaking so as to provide the foundation for subsequent discussion on collective sensemaking. Specifically, it will propose a model describing the collective sensemaking process, commonly observed in a team confronting a novel situation. Second, it discusses some of the pitfalls that may affect the quality of the collective sensemaking process. Finally, it puts forward a number of recommendations to mitigate the effects of these pitfalls before concluding.

INDIVIDUAL SENSEMAKING

> *"A problem defined is half solved."*
> *– Old management axiom*

Sensemaking is one of the most important key human processes. Without it, people will not be able to size up situations and respond appropriately. Sensemaking is defined as:

> The process of creating situation awareness (**cognitive certainty**) in situations of uncertainty by putting the **available information** about the situation **in context** and **identifying patterns** that exist. It goes beyond what is happening or may happen to what can be done about it. It utilizes individual or team experience on the available information to construct relevant, meaningful understanding of the situation or events at both the individual and group levels. It is typically triggered by unexpected changes or other surprises that cast doubts on initial understanding. Through the accurate construction of meaning, clarity increases and confusion decreases.[6]

Figure 1 depicts the proposed model of sensemaking at the individual level by COL Ong and LTC Lim. This essay will only briefly discuss individual sensemaking to provide the foundation for the discussion on collective sensemaking.

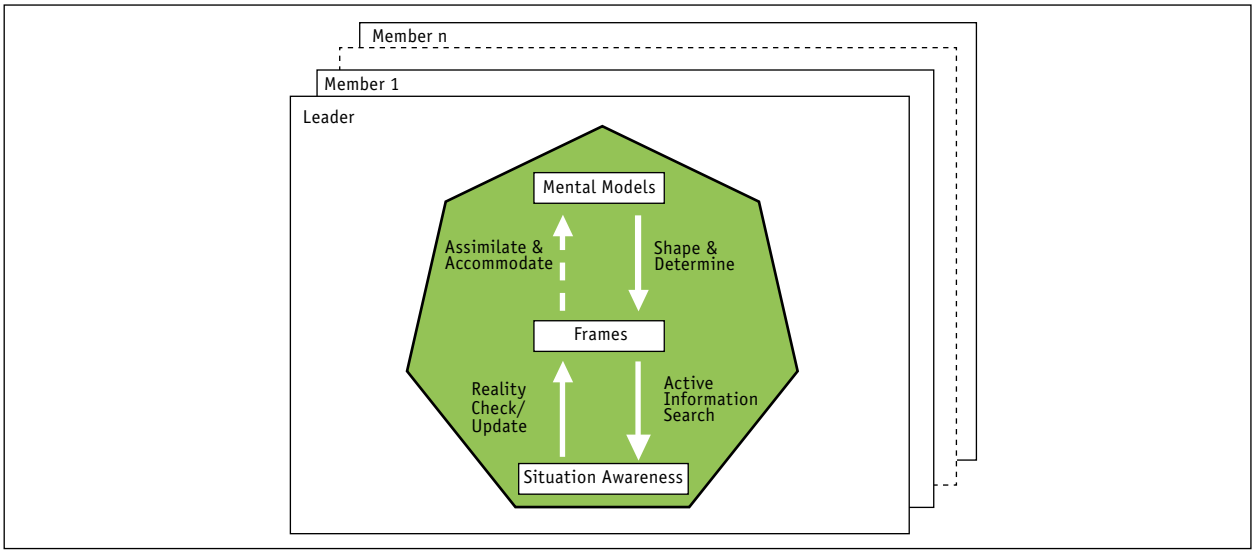

Figure 1: A Proposed Model of Individual Sensemaking Processes.[7]

Essentially, a situation perceived either as a potential problem or an opportunity, especially a novel situation, will trigger off the sensemaking process. At the individual level, sensemaking is primarily a cognitive process. It is an ongoing process of reflecting, refining understanding, constructing meaning and taking action. The starting point is a cognitive frame, analogous to a sheet of paper. This preliminary frame may well be a blank sheet of plain paper, but most of the time it should already contain some information in it. This preliminary information is based on what is readily available in the emerging environment. However, as this preliminary frame is likely to be incomplete or incoherent, it engenders the sensemaking process.

As his frame gains clarity with decreased perceived ambiguities, the individual becomes more confident in his framing of the emerging situation. However, this does not mean that his frame is the correct representation of the situation: it simply means that he thinks he has a good grasp of the situation, which may or may not reflect reality.

Two parallel cognitive processes will jump-start the sensemaking process. First, existing mental models: a repository of one's experiences and knowledge acquired over time, aid the building up of the preliminary frame by providing relevant information acquired from similar situations in the past. With this additional input, the prevailing frame may become clearer, like an image viewed through a camera becomes sharper as we adjust its optical lens. In other words, existing mental models shape and determine the nature of the preliminary frame by enhancing its clarity and reducing its ambiguities. At the same time, it also helps to identify the inconsistencies and gaps in the emerging frame and subsequently helps to formulate questions that will guide further information seeking efforts.

Second, cognitive dissonance, a driving force to reduce the discomfort experienced in the mind which arises from ambiguities in the prevailing frame,[8] propels the individual to engage the environment in order to actively seek out information that reduces the ambiguities present in the prevailing frame. New information which is brought to the awareness of the individual is subsequently used to update the frame. One possible pitfall, however, is that inconsistencies which may prove relevant are likely to be ignored as they increase the cognitive dissonance rather than reduce it.

This active searching for information and updating the frame are two iterative processes. After a number of iterations, the evolving frame becomes clearer and less ambiguous to the individual. As his frame gains clarity with decreased perceived ambiguities, the individual becomes more confident in his framing of the emerging situation. However, this does not mean that his frame is the correct representation of the situation: it simply means that he thinks he has a good grasp of the situation, which may or may not reflect reality. If he then finds that his understanding of the emerging situation is wrong, he risks being "situationally" surprised.

Assuming that his prevailing frame is the correct representation of the situation, and that the sensemaking process has led him to react appropriately and successfully to the situation, the newly acquired frame will subsequently be integrated into his existing mental models through the process of assimilation and accommodation.

With every successful sensemaking cycle, the individual will gain expertise in his specific domain. This expertise resides in his mental models. Thus, it is not surprising that it takes time and effort to develop expert mental models in any domain. On the other hand, expert mental models are inherently resistant to change, leading to the risk of being wrong with dire consequences—fundamentally surprised. This issue will be revisit when discussing sensemaking at the team level: there are ways in which we can harness the power of the framing process and expert mental models, yet reduce their vulnerabilities.

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COLLECTIVE SENSEMAKING

This essay has briefly discussed how sensemaking occurs in the cognition of an individual when faced with a situation that requires action. However, sensemaking can occur at both the individual and the team level.

At the individual level, sensemaking is a cognitive process whereby one conceptualizes a cognitive representation of an emerging situation, first by paying attention to the most salient cues and information in the situation and then by allowing existing mental models to shape understanding of this preliminary set of information to determine the initial frame. Subsequently, an active information search is conducted to enhance clarity and reduce ambiguities, sharpening the preliminary frame. This process is iterative. The individual sensemaking process continues until the individual has his cognitive dissonance reduced and is confident that the frame is an accurate cognitive representation of the emerging situation.

Similarly, when a group of experts are confronted with an emerging situation, sensemaking will be triggered. While each of the experts will conduct his own sensemaking, a team will also trigger the collective sensemaking process. In other words, collective sensemaking can occur when a group of individuals encounter an emerging situation where they share responsibility and commitment to bring it to a satisfactory conclusion. Whether the individual sensemaking by the various members will enhance or impair the collective sensemaking is very much dependent on a number of factors, including team dynamics.

Unlike individual sensemaking, collective sensemaking in a team is a socio-cognitive activity. The following example illustrates the difference between individual sensemaking and collective sensemaking:

Imagine that a tsunami has just struck one of our neighbouring countries and a brigade commander has been tasked with the Humanitarian Assistance Disaster Relief (HADR) mission. News from the disaster zone is just trickling in at this point. Incomplete information abounds—some of it contradictory. At this juncture, there is no way to confirm the toll in both

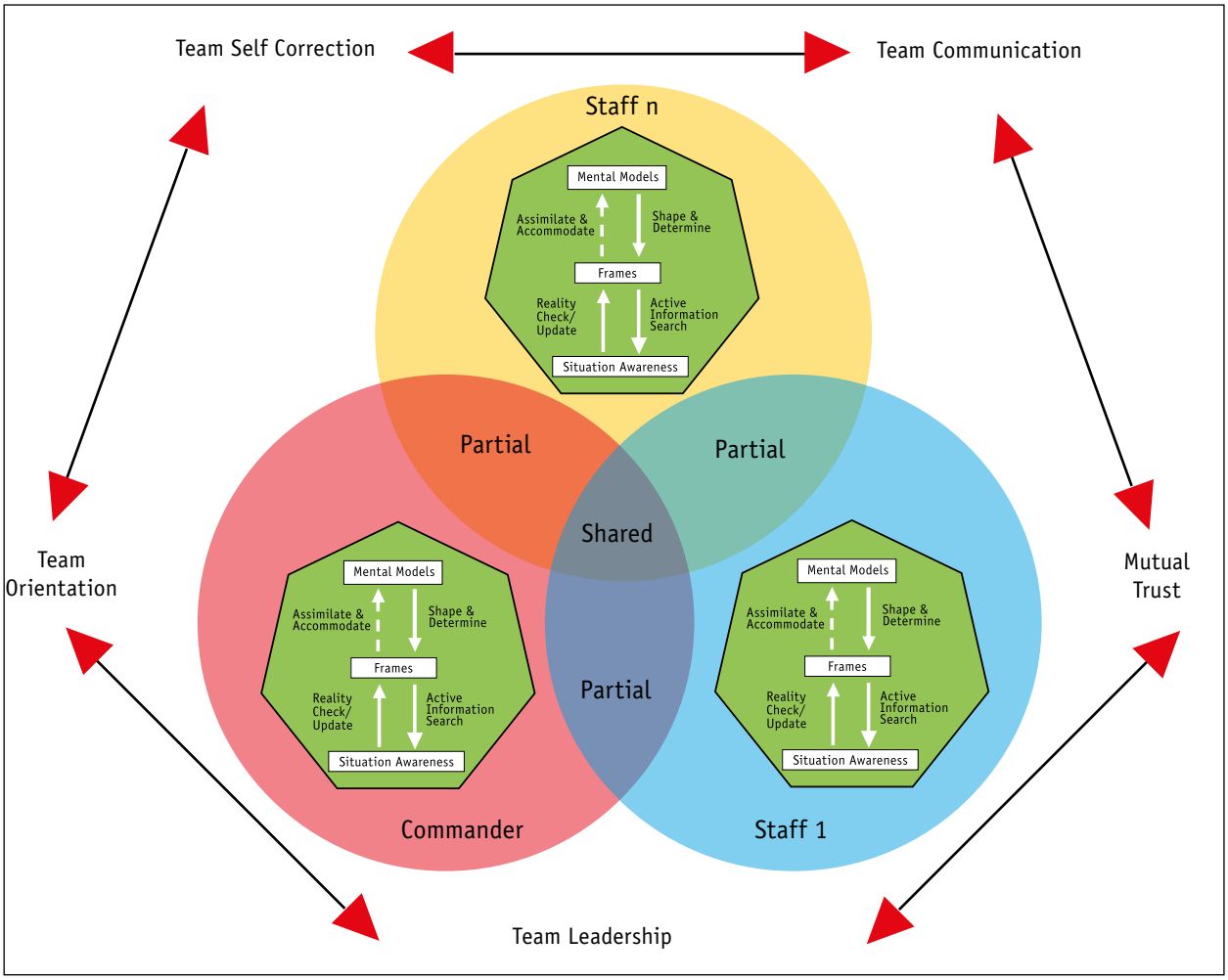

Figure 2: A Proposed Model of Collective Sensemaking

infrastructure and human lives. In his command centre, the commander and his principal staff are trying to make sense of the emerging situation by going through bits and pieces of information as they trickle in from all sources.

How then does this command team make sense of the emerging situation? For a start, the commander and his staff would have brought different mental models to the team due to varying experiences and training. These mental models might overlap in some aspects among members of the team, depicted as "partial overlap" in Figure 2. It is also highly likely that the commander and his staff have some aspects of their mental models fully overlapped as shared mental models, given prior interactions and the fact that they belong to an organization where standard operating procedures and doctrine abound. Obviously, there are also aspects of each member's mental models that are not shared by others in the team. These non-overlapping aspects, optimally harnessed, will provide the greatest potential for the team to outperform any of its members individually.

PRELIMINARY INDIVIDUAL FRAME VERSUS PRELIMINARY COLLECTIVE FRAME

Due to their differing mental models, the preliminary individual frame of the commander and his staff may or may not be similar. As indicated previously, here lies the potential strength of having a team as compared to an individual. The team mental models, aggregated from the mental models of all the members, are definitely much more extensive than any

one individual's, as depicted in Figure 2. These team mental models have much greater potential to provide a more comprehensive framing of the emerging situation. However, there are many challenges facing a team trying to fully harness the power of its collective mental models. As mental models are resident within each individual's cognition, the challenge is making each of these mental models explicit to other team members so that their relevant aspects can be aggregated for the benefit of the team in the creation of a more extensive preliminary collective frame—one more comprehensive than any individual frame.

Unlike individual sensemaking, collective sensemaking is a socio-cognitive process as the attainment of the preliminary collective frame requires the creation of shared meaning and understanding among team members through communication and the exchange of ideas and perspectives.[9] In the process, relevant aspects of individual mental models are brought to bear on the team's preliminary collective frame.

TEAM PROCESSES THAT ARE CRITICAL FOR COLLECTIVE SENSEMAKING

Consistent with the framework proposed by COL Ong and LTC Lim, within the decision making process in a team context,[10] there are at least five team processes that are critical for a successful collective sensemaking process:

(1) **Team Leadership.** Traditionally, leadership is often perceived as residing within an individual. In the context of the military, that individual is the commander. However, leadership is different from authority, and the two should not be confused. The commander will always have the final authority but leadership qualities can also be exhibited by other team members. Team leadership is about sharing the responsibility of leadership among its members. It is as important for any member of the team to exhibit leadership as it is for them to be team players. Leadership should be provided by the member with the appropriate knowledge, skills and abilities for resolving the issue facing the team at any given moment.[11] This form of leadership departs from the traditional view of leadership. Team leadership is a form of team-related behaviour that is highly effective for complex tasks.

If the commander dominates the sensemaking process, his mental models will dominate the preliminary frame and probably subsequent frames as well. While this may be necessary under certain circumstances (such as when the commander is the only expert), it is probably more effective for the mental models of the other members to contribute to the team mental models and the preliminary collective frame. Referring back to Figure 2, it is easy to understand why a commander-centric framing of the emerging situation may not be optimal, especially if there are other experts on the team. The commander's mental models will become the dominant mental models and will prove in most cases less comprehensive than team mental models aggregated from the views of all the other team members. Moreover, a commander-centric sensemaking is not a collective sensemaking process, but an individual sensemaking process. Hence, the presence of team leadership is critical for collective sensemaking, and commanders hold the key to creating a climate where team leadership flourishes and members feel comfortable to lead when necessary.

(2) **Team Orientation.** Once the climate for team leadership is established, team orientation and mutual trust, which will be discussed later, are often the result. When team members feel that they can contribute and have contributed to the team, they become stakeholders. They want only the best for the team and will be willing to make sacrifices. Members of a team that focuses on team orientation tend to have a strong team identity, believe in a team effort when achieving goals, have faith in the team's ability to face adversity, and are highly

committed to team goals. Team orientation is critical for collective sensemaking as it motivates members to contribute and work together with each other. In sum, highly team-oriented members are more likely to transcend self-interest and give their best for a higher collective purpose. In terms of sensemaking, they are likely to be more proactive in seeking information and will meticulously tap into their mental models in order to contribute to the team.

(3) **Mutual Trust.** Mutual trust is another source of motivation for team members to work together for the benefit of the team. Together with team orientation, mutual trust is important as it reinforces bonding and creates an open climate for team members to speak their mind, without fear of penalty or embarrassment. This is of paramount importance for collective sensemaking because key elements in the environment may be overlooked if members are held back by self doubt. Subtle but important relationships among these key elements may also be ignored if team members are only comfortable in bringing out the obvious.

(4) **Team Self-Correction.** Members of a team high on team orientation and mutual trust will want to do what is best for the team. However, they are also likely to seek consensus and alignment with one another. While a lack of consensus and alignment are common characteristics of bad teams, it does not mean that good teams must always seek consensus or alignment. On the contrary, effective teams often have differences over what team tasks should be (task conflict) and how the team should go about doing these team tasks (process conflict).[12] The basic difference between good and poor teams is that good teams have mechanisms to resolve these task-related and process-related conflicts. The lack of an effective conflict resolution mechanism in poor teams results in these conflicts boiling over and becoming interpersonal conflicts that harm relationships between members.

In short, apart from high team orientation and mutual trust, effective teams have also developed what researchers call "team self-correction." Self-correction behaviours include: questioning assumptions and rationales; engaging in mutual and team performance monitoring; constantly reviewing mental models and prevailing frames; validating hypotheses and assumptions; and being ready to provide and receive feedback. It does not take much for one to realize that these team self-correction behaviours are potential sources of task and process conflicts. Indeed, in any team, these types of conflicts are inevitable. However, the difference is that they are actually welcomed in effective teams as they will improve performance in the long term.

A team's ability to self-correct is a critical aspect of collective sensemaking due to the tendency for humans to utilize heuristics (e.g. anchoring and adjustment, recognition heuristics and similarity heuristics) in making sense of the world to ensure cognitive efficiency and prevent information overload.[13] Conformation is also more likely in a team context. Hence, there is a need for team members to continuously check one another's mental models and assumptions to prevent cognitive pitfalls from creeping into their sensemaking process.

(5) **Team Communication.** Last, but not least, is team communication. Team communication is the vehicle through which ideas are exchanged, information is shared, assumptions are questioned, mental models are made explicit, and conflicts and disagreements are resolved. Hence the importance of open and constructive communication in a team cannot be overemphasized—it is instrumental for collective sensemaking to take place.

These five team processes can be viewed as centrifugal and centripetal forces constantly pushing away or pulling towards the centre. Collectively, these forces produce either a contracting or expanding band which leads to different degrees of sensemaking overlap between members. It is a contracting band when these five team processes are optimal and producing good outcomes and an expanding band when they are not. Obviously, it is not always necessary for the band to contract or expand evenly along its circumference as team processes can exert different amounts of influence and their effects on individual members may also differ. Intuitively, this visualization is sound, as it can be expected that not all team members will "bond," "feel," "view" and "accept" in the same way and the "closeness" between some will be greater than others. This explains a common observation in teams where some members have a better shared understanding of the situation than others.

However, as individuals operate in teams, individual problem conceptualization is insufficient.

These five team processes are critical for the development of the preliminary frame because they determine the extent to which each team member's mental models are brought to bear on its development. If the processes are not optimized, it means that not all the team members' experiences and expertise are being used for the benefit of the team. Moreover, it also means that team members are likely to possess different preliminary frames. These differing views of the emerging situation may disrupt the subsequent framing process such that the sensemaking process takes longer than necessary, or the team is not able to achieve a shared collective frame at all.

Like mental models, frames can be shared, partially overlapping, or not overlapping as depicted in Figure 2. In the event that the team does not share a common frame, the collective sensemaking process has failed. What happens is simply individual sensemaking. Problem conceptualization involves the construction of the problem space. However, as individuals operate in teams, individual problem conceptualization is insufficient. Shared conceptualization is necessary for effective team problem solving; a team's comprehension of the critical problem components should contain a substantial amount of overlap. These five team processes thus play an important role in ensuring an optimal collective sensemaking process.

SHARPENING THE PRELIMINARY COLLECTIVE FRAME

Assuming that the team has a preliminary collective frame (i.e. individual frames are more or less shared), the active information search by team members and updating of both individual and collective frames are two iterative processes that will continue until all the team members have their cognitive dissonance reduced and are confident that the collective frame is an accurate cognitive representation of the emerging situation. After going through a number of iterations, the evolving collective frame becomes clearer and less ambiguous to the team as a whole. As this frame gains clarity and decreased perceived ambiguities, the team becomes more confident in its framing of the emerging situation. Again, this does not mean that the frame is the correct representation of the situation. It only means that the majority, if not all, of the team members think that they have a good grasp of the emerging situation.

Assuming that this prevailing frame is the correct representation of the situation, and this sensemaking process has led the team to react appropriately and successfully to the situation, the newly acquired frame will subsequently be integrated into the team's mental models through the process of assimilation and accommodation.

If there is a preliminary collective frame, this would mean that individual preliminary frames are at least partially overlapped, if not shared. On the other hand, there will be different degrees of understanding among team members if they do

not share a preliminary frame, leading to different interpretations of the evolving situation in subsequent discussions. This can further damage the already suboptimal team processes by allowing task and process conflicts to turn into interpersonal conflicts, inevitably affecting the subsequent sensemaking process. This situation is, at best, a collection of many independent individual sensemaking processes rather than collective sensemaking.

Collective sensemaking is critical for team performance. However, there are a number of inherent pitfalls, some occurring in the individual sensemaking process, others in a team context.

PITFALLS TO EFFECTIVE SENSEMAKING AT THE INDIVIDUAL AND TEAM LEVEL

As individual sensemaking is a cognitive process and collective sensemaking is both a cognitive and social process, there are a number of cognitive and social biases that can affect the quality of these sensemaking processes. This section discusses some of the common pitfalls that may impede effective sensemaking at both the individual and team levels. Hopefully, one can mitigate some of these negative effects by being aware of their existence.

Table 1 depicts some of the common pitfalls in the literature. To aid understanding, I have classified them into the following nine categories:

1. **Initial tendency to anchor.** Humans have the tendency to seek an anchor as a starting point when sizing up a situation. This anchor can either be found in the current situation or from mental models based on past experiences. This anchor is analogous to the preliminary frame discussed earlier. Once determined, it forms the basis for the assimilation of subsequent information and data. Hence, it is of paramount importance that we are aware of the inadequacy of this preliminary anchor and not fixated on it.

   a. What individuals can do to prevent this pitfall:

   - Be aware of this cognitive tendency and try to question the validity of this initial set of information, especially if it contradicts subsequent information received.
   - Leaders should avoid anchoring their subordinates. During initial stages, reveal as little as possible about one's own ideas, estimates, and tentative decisions.
   - Get members to develop their preliminary frame independently before conducting collective sensemaking.

   b. What the team can do to mitigate this pitfall:

   - Have other team members focus on an equally feasible set of information as their starting point so that the team will not be fixated on a particular set of information.
   - Build team self-correction mechanisms.
   - Encourage groups of individuals in the team to have different starting frames.

2. **Fixated on the status quo.** Humans have the tendency to be fixated on the status quo. In terms of sensemaking, this means that team members are likely to maintain the preliminary frame longer than necessary, even when confronted with contrary information. Under these circumstances, team members are likely to perpetuate the inappropriate frame by investing even more resources seeking additional information and data in hope of validation. This tendency stems from a sense of commitment and ownership for the original frame.

   a. What individuals can do to prevent this pitfall:

   - Leaders should not cultivate a failure-fearing culture that leads subordinates to perpetuate their mistakes.
   - Be aware that there is no necessity to appear consistent to others, especially when one encounters information that runs contrary to one's frame.
   - Always remember it is about the idea, not about the person.

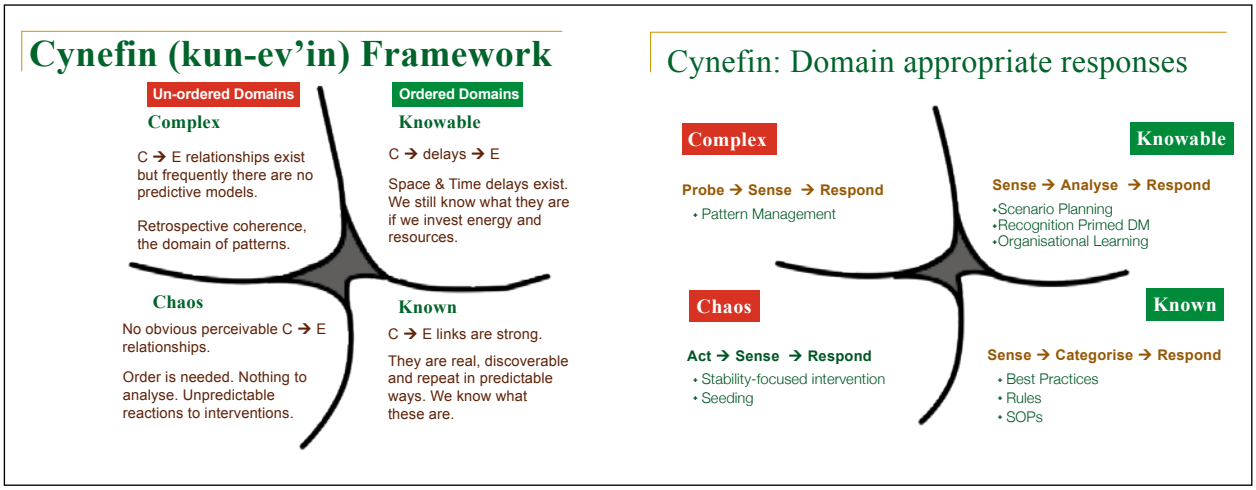

Figure 3: Snowden's Cynefin Framework

b. What the team can do to mitigate this pitfall:

- If the team is big enough, try breaking it up into two to three smaller groups to conduct subgroup sensemaking before coming together for collective sensemaking. Alternatively, have a small group of team members as observers or playing devil's advocates.
- Build mutual trust in the team so that members are willing to admit mistakes.
- Build team self-correction mechanisms.

3. **Always remembering the sore thumb.** Humans are likely to give undue weight to recent, dramatic events, even if these events may not be as relevant to the situation at hand compared to information collected earlier on.

a. What individuals can do to prevent this pitfall:

- Be aware of the inadequacies of the human brain in its inability to recall information or events. In addition, human brains are more likely to encode dramatic and hence emotionally charged events and information more deeply. Consequently, these events and information also become more frequently accessed.
- Ask yourself, how would the perception of the situation be different without the inclusion of that dramatic event?

b. What the team can do to mitigate this pitfall:

- Keep records of the information flow in the team. Constantly review them to keep them updated.
- Review discarded data and information to see whether they are relevant in the current situation.

4. **Humans as biased information seekers.** Humans often subconsciously seek information to reaffirm preconceptions. When confronted with information that contradicts their prior perception, they would either be overly critical of the information or simply ignore it.

a. What individuals can do to prevent this pitfall:

- Avoid the tendency to accept confirming evidence without question.

b. What the team can do to mitigate this pitfall:

- Get someone to play the devil's advocate and to argue against the confirming evidence.
- Get a small group of members to build an alternate frame by giving more weight to inconsistent information. Then, check it against the original frame to identify discrepancies between the two interpretations of the situation.

5. **Humans as poor fortune tellers.** Humans have the tendency to believe that they can control or influence outcomes which they clearly cannot. This is particularly problematic in complex or chaotic situations.[14] Humans are likely to insist that cause must have an effect and every effect must have a cause. According to Kurt and Snowden's Cynefin model, there are four problem spaces: ordered domains (knowable and known) and unordered domains (complex and chaos). In the ordered domains, where the cause-effect links are strong, one can certainly try to determine how the situation will evolve through its current state. However, as we move into the unordered domains, the cause-effect links may not be obvious and, most of the time, they are likely to be too complex to discern. Our commanders are more likely to operate in the unordered domains. Therefore, efforts committed to predicting future states in these situations or determining specific desired end states may be futile.

   a. What individuals can do to prevent this pitfall:

   - There is no one-size-fits-all problem solving strategy. One should determine the domain one is operating in before devising a strategy to deal with the emerging situation. In the ordered domain, one should first conduct sensemaking before acting. However, in the unordered domain, one may have to probe or act first before one can sensemake. See Figure 3 for more details.

   b. What the team can do to mitigate this pitfall:

   - Always help to keep some members in check, especially when they become too zealous with predicting future states, in particular those in the distant future.

6. **Humans see patterns when none exist**. Similar to the tendency to look for cause-effect links, human minds are hardwired to look for patterns within the environment. This tendency often works well for us. Unfortunately, in situations where no systematic patterns exist, our minds try to imagine one. This tendency stems from the belief that things are not random phenomena and are connected in some way.

   a. What individuals can do to prevent this pitfall:

   - Question proposed linkages between events and information, especially if they are far apart in terms of time and space.

   b. What the team can do to mitigate this pitfall:

   Appoint devil's advocates to propose equally feasible linkages between the same set of events and information.

7. **See, I am right!** Humans have pre-existing predilections and beliefs. While these may be subconscious, their influence on thought processes and actions are significant. In sensemaking, one's perception of the situation is very much influenced by personal experiences and beliefs. Humans are likely to engage in behaviours that will elicit results which will confirm or further reinforce their belief or initial prejudice. This is especially true in ambiguous situations.

   a. What individuals can do to prevent this pitfall:

   - Be cognizant that one's experience should only be a guide.

   b. What the team can do to mitigate this pitfall:

   - Open and constructive team communication.
   - Practise team leadership in the team. This is especially important in mitigating the negative effects of a leader's mental models if he is wrong.

8. **We are all the same.** Humans are social creatures. Under normal circumstances, humans do not want to be the oddball in a group. Hence they have the tendency to do or believe in things that the majority does. This often leads people in social groups to seek consensus rather than encourage dissent and critical analysis. Moreover, as people would like to think that they are no different from many others, they tend to

POTENTIAL PITFALLS	EXPLANATION	LEVEL	
		IND	GRP
INITIAL TENDENCY TO ANCHOR			
Anchoring Trap	The tendency to rely too heavily, or "anchor," on one trait or piece of information when making decisions.	√	
Primacy Effect	The tendency to weigh initial events more than subsequent events. Leads one to give disproportionate amount of attention to the first information one receives.	√	
FIXATED ON THE STATUS QUO			
Status Quo Trap	One's bias toward maintaining the current situation—even when better alternatives exist.	√	√
Sunk-Cost Trap	Inclines one to perpetuate mistakes of the past.	√	√
Escalation of Commitment	The tendency to invest more resources in a course of action despite its trajectory towards failure.	√	√
Endowment Effect	The tendency for people to value something more as soon as a sense of ownership is made.	√	√
Post Purchase Rationalization	The tendency to persuade oneself through rational argument that a purchase was good value.	√	
ALWAYS REMEMBERING THE SORE THUMB			
Recallability Trap	Leads one to attribute undue importance to recent and dramatic events.	√	
Von Restorff Effect	The tendency for an item that "sticks out like a sore thumb" to be remembered more than other items.	√	
Recency Effect	The tendency to value recent events more than earlier events.	√	
HUMANS AS BIASED INFORMATION SEEKERS			
Confirmation Bias	The tendency to search for or interpret information in a way that validates one's preconceptions.	√	
Discomfirmation Bias	The tendency for people to extend critical scrutiny to information which contradicts their prior beliefs and uncritically accept information that is congruent with their prior beliefs.	√	
Ambiguity Effect	The avoidance of options for which missing information makes the probability seem "unknown."	√	
Selective Perception	The tendency to be influenced by prior expectations to interpret only certain, selected information.	√	
Information Bias	The tendency to seek information even when it cannot affect action.	√	
Availability Bias	The influence of the relative availability of objects or events (their accessibility through memory, perception, or imagination).	√	
HUMANS AS POOR FORTUNE TELLERS			
Illusion Control	The tendency for human beings to believe they can control or at least influence outcomes which they clearly cannot.	√	√
Planning Fallacy	The tendency to underestimate task completion times.	√	
Overconfidence Trap	Makes one overestimate the accuracy of forecasts.	√	√
Prudence Trap	Leads one to be overcautious when one makes estimates about uncertain events.	√	√

HUMANS SEE PATTERNS WHEN NONE EXIST			
Clustering Illusion	The tendency to see patterns when none exist.	√	
Gambler's Fallacy	The tendency to assume that individual random events are influenced by previous random events—"the coin has a memory."	√	
Illusory Correlation	Beliefs that inaccurately assign a relationship between certain types of actions and effects.	√	
SEE, I AM RIGHT!			
Self-Fulfilling Prophecy	The tendency to engage in behaviours that elicit results which will (consciously or subconsciously) confirm our beliefs.	√	
Positive Outcome Bias	A tendency to predict and overestimate the probability of positive results and situations.	√	
Implicit Favourite Bias	The tendency to have a preferred alternative and although not fully aware of this preference, to engage in a process of considering alternatives that merely confirm the initial prejudice.	√	
"My Side" Bias	The tendency for people to fail to look for or to ignore evidence against beliefs they already favour.	√	
Personal Experience Bias	The tendency to be influenced by strong personal experiences to the point of ignoring other information.	√	
Belief Bias	The tendency to base assessments on personal beliefs.	√	
Self Serving Bias / Group-Serving Bias	The tendency to claim more responsibility for successes than failures. It may also manifest itself as a tendency for people to evaluate ambiguous information in a way beneficial to their interests.	√	√
WE ARE ALL THE SAME			
Bandwagon Effect / Groupthink	The tendency to do (or believe) things because many other people do (or believe) the same. The tendency to seek consensus rather than encourage dissent and critical analysis.		√
False Consensus Effect	The tendency for people to overestimate the degree to which others agree with them.		√
Projection Bias	The tendency to unconsciously assume that others share the same or similar thoughts, beliefs, values, or positions.		√
Illusion of Transparency	People overestimate their own and others' ability to be perceptive.		√
HUMANS ARE NOT OBJECTIVE WHEN THEY ARE TOGETHER			
Risk / Cautious Shift	The tendency of a group to favour riskier or more conservative actions when responsibility is shared.		√
In-Group Bias	Preferential treatment people give to those they perceive to be members of their own group.		√
Halo Effect	The tendency for a person's positive or negative traits to "spill over" from one area of their personality into another in the perceptions of others.		√

Table 1: Common pitfalls

overestimate the degree to which others agree with them by assuming that others share the same or similar thoughts, beliefs, values, or positions.

a. What individuals can do to prevent this pitfall:

- Be aware that high level of team orientation does not mean that team members have to agree with one anotherat all times.

b. What the team can do to mitigate this pitfall:

- Build team self-correction mechanisms.

9. **Humans are not objective when they are together.** In large social groups, humans have the tendency to form subgroups. This is inevitable as different people have different comfort levels with one another depending on race, gender, and background, among other factors. Subsequently, people may treat other group members differently depending on whether they perceive them to be members of their subgroup. In addition, they may be willing to take greater risks collectively than they would individually. The reverse is also possible. Hence, the influence of the group on individuals cannot be underestimated. In terms of sensemaking, this preferential treatment of in-group members and the tension between sub-groups may impede information sharing and objectivity, leading to suboptimal sensemaking at the group level.

a. What individuals can do to prevent this pitfall:

- Be aware of this tendency. Make an effort to know everyone in the team, including those that one feels uncomfortable with from the outset.

b. What the team can do to mitigate this pitfall:

- Conduct team building to ensure that team vision, rules, roles and relationships are well-established.
- Always have some members acting as devil's advocates or observers to question the team's assumptions, beliefs and decisions.

CONCLUSION

Sensemaking is an important human activity. Although some of us are better at sensemaking than others, we are generally quite good at it. However the same cannot be said of teams. Collective sensemaking does not come as naturally—simply putting a group of people together does not mean they will operate as a team.

Systematic efforts have to be put in place to build a team and its collective sensemaking process. Hence, in addition to the specific actions that teams should adopt during their collective sensemaking process, this essay ends off with three more systems-level recommendations for enhancing the collective sensemaking process of our command teams in the SAF.

1. **Leadership Training.** Increasingly, we need leaders who are comfortable with having their team members taking the lead when necessary. Third Generation leaders should speak less in order for the team to say more. In addition, Third Generation leaders must possess the ability to build teams and establish a climate where team members are not fearful of failure and are willing to question the assumptions of other members and even the leader.

2. **Education**. Commanders and staff should be educated on the potential pitfalls of individual sensemaking and collective sensemaking.

3. **Procedure for Collective Sensemaking.** Despite the paucity of research on collective sensemaking, enough is known for the development of a procedure to train the SAF's command teams in conducting collective sensemaking. This procedure should be akin to our battle procedures except that its primary purpose is for a command team to sense up an emerging situation quickly and more comprehensively. It should be equally applicable to both conventional operations and operations-other-than-war.

In conclusion, we are only beginning to make sense of sensemaking, especially collective sensemaking. 1 + 1 > 2 is achievable in a team context. Collective

frames and team mental models are far more robust than individual frames and individual mental models respectively. Hence, command teams that take the time and effort to develop a collective frame will be less susceptible to situational surprise. Likewise, command teams with well-developed team mental models will be less prone to fundamental surprise.

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ENDNOTES

1. COL Ong Yu Lin and LTC Lim Beng Chong, PhD, "Decision-making in a Brigade Command Team: Integrating Theory and Practice," *POINTER* 30, no. 4 (2005): 20-38.
2. C. F. Kurt and D. J. Snowden, "The New Dynamics of Strategy: Sense-making in a Complex and Complicated World," *IBM Systems Journal* 42, no. 3 (2003): 462-483.
3. Ong and Lim, "Decision-making in a Brigade Command Team," 20-38.
4. Carol R. Paris, Eduardo Salas, and Janis A. Cannon-Bowers, "Teamwork in Multi-Person Systems: A Review and Analysis," *Ergonomics* 43, no. 8 (2000): 1052.
5. Ong and Lim, "Decision-making in a Brigade Command Team," 20-38.
6. COL Ong Yu Lin and LTC Lim Beng Chong, PhD, "Piercing the Fog: Making Sense of Sensemaking," manuscript under preparation for *POINTER*.
7. Ibid.
8. Cognitive dissonance is the perception of incompatibility between two cognitions, which can be defined as any element of knowledge, including attitude, emotion, belief, or behavior. The theory of cognitive dissonance holds that contradicting cognitions serve as a driving force that compels the mind to acquire or invent new thoughts or beliefs, or to modify existing beliefs, so as to reduce the amount of dissonance (conflict) between cognitions. See "Cognitive Dissonance," *Wikipedia*, en.wikipedia.org/wiki/Cognitive_dissonance.
9. Karl E. Weick, *Sensemaking in Organizations* (Thousand Oaks, California: Sage Publications, 1995).
10. Ong and Lim, "Decision-Making in a Brigade Command Team," 20-38.
11. Craig L. Pearce, "The Future of Leadership: Combining Vertical and Shared Leadership to Transform Knowledge Work," *The Academy of Management Executive* 18, no. 1 (2004): 47-60.

12. Karen A. Jehn, Gregory B. Northcraft, and Margaret A. Neale, "Why Differences Make a Difference: A Field Study of Diversity, Conflict, and Performance in Workgroups," *Administrative Science Quarterly* 44 (1999): 741-763.

13. In psychology, heuristics are simple, efficient rules of thumb which have been proposed to explain how people make decisions, come to judgments and solve problems, typically when facing complex problems or incomplete information. These rules work well under most circumstances, but in certain cases lead to systematic cognitive biases. See "Heutrisitc," *Wikipedia*, en.wikipedia.org/wiki/Heuristic.

14. Kurt and Snowden, "The New Dynamics of Strategy," *IBM Systems Journal* 42, no. 3 (2003): 462-483.

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