Forcing Strategic Evolution: The SAF As An Adaptive Organization

by **CPT Choy Yong Cong**

Abstract:

The evolution of warfare is analogous to the evolution of natural populations. The idea of Fourth Generation Warfare (4GW) and its evolution was first pioneered by William S. Lind and his co-authors in 1989, and has since gained prominence in describing the current state of asymmetrical warfare prevalent around the world. Akin to natural populations adapting to the changing environment and therefore evolving, there are societal factors driving the evolution of how organizations conduct warfare. In a flat, networked world where information is exchanged freely, the change in societal factors will be accelerated, resulting in an increasingly fast-changing and unpredictable environment. It is this environment that all militaries, including the Singapore Armed Forces (SAF), will find themselves conducting business in.

If the SAF operates in an environment of accelerated unpredictability, strategy must become adaptive—there is no other viable option. Thus the SAF should not plan to fight 4GW or any other predicted future state of war, because if the military environment changes faster than any strategic assessment or doctrinal implementation, it will always find itself fighting "the last war." Instead, the SAF should re-engineer itself as an adaptive organization—one that can continuously and systemically reinvent itself to stay relevant and achieve its fundamental goal of enhancing Singapore's peace and security.

Keywords: Adaptive Organisation; Fourth Generation Warfare; Future War; Knowledge Management

"It is not the strongest of the species that survives, nor the most intelligent, but rather the one most adaptable to change."

- Paraphrase of Charles Darwin's On the Origin of Species by Leon C. Megginsoni[1]

INTRODUCTION

Charles Darwin's contribution to humankind was immense. His scientific theory of evolution,[2] which established that natural selection was the mechanism responsible for the variation and diversity of life, became the unifying theory of life sciences. Its relevance today to other sciences such as complexity theory and genetics confirms its status as an enduring principle to explain trends of adaptive systems in complex environments, both social and non-social.

The evolution of warfare is analogous to the evolution of natural populations. The idea of Fourth Generation Warfare (4GW) and its evolution was first pioneered by William S. Lind and his coauthors in 1989,[3] and has since gained prominence in describing the current state of asymmetrical warfare prevalent around the world. Akin to natural populations adapting to the changing environment and therefore evolving, there are societal factors driving the evolution of how organizations conduct warfare. In a flat, networked world where information is exchanged freely, the change in societal factors will be accelerated, resulting in an ever faster-changing and unpredictable environment. It is this environment that all militaries, including the Singapore Armed Forces (SAF), will find themselves conducting business in.

This essay will argue that if the SAF operates in an environment of accelerated unpredictability, strategy must become adaptive—there is no other viable option.[4] The SAF should not plan to fight 4GW, or any other predicted war, because if the rate of change of the environment is faster than strategic assessment or doctrinal implementation, it will always find itself fighting "the last war."[5] Instead, the SAF should

re-engineer itself as an adaptive organization—one that can continuously and systemically reinvent itself to stay relevant and achieve its fundamental goal of enhancing Singapore's peace and security.[6]

THEORY OF EVOLUTION AND NATURAL SELECTION

First, it would be illuminating to appreciate Darwin's theory of evolution and natural selection. Ernst Mayr, a biologist, summarized it well through a series of facts and inferences.[7] Since every species has the potential for exponential reproduction, but resources such as food are limited and stable over time, there must be a fierce struggle for existence, resulting in the survival of only a small part of the populations. Individuals that are more suited to the environment will survive and reproduce, whereas individuals that are not will be less likely to survive and reproduce. Those that are successful will leave their inheritable traits to future generations, which is the process of natural selection. Combined with the fact that genetic traits can be varied and hereditary, in a changing environment over a long period of time, variations are seen in populations, resulting in evolutionary change

Throughout the centuries, the natural environment has changed unpredictably. Humans, or more accurately the collection of their genes,[8] are able to survive and dominate their environment not because the species was born adaptive—but through the process of natural selection, has evolved into an adaptive species. To satisfy their inherent urge of survival and dominance, even over each other, humans have continued to evolve not just their genetic traits, but ideas, processes and systems.

EVOLUTION OF WARFARE

The natural environment changes unpredictably due to factors beyond our control—climate, dynamic interactions between complex organisms, etc. Analogous to this is the environment in which warfare is conducted. Colonel Thomas X. Hammes, in his book *The Sling and the Stone*, built upon Lind's work to attribute the evolution of warfare from First Generation Warfare (1GW) to 4GW to four societal aspects—political, economical, social and technological.[9] These are the environmental factors that have eliminated and created warfighting organizations

over generations, and through natural selection the conduct of warfare has been evolved as such:

The development of agriculture 10,000 years ago changed human society. Societies were no longer preoccupied with the daily struggle for food, were able to settle and developed a political structure with a ruling class. This social organization allowed specialization in other areas, including the conduct of warfare. With the ruling class able to harness manpower, a professional class of warriors emerged. From the classical times up to the French Revolution, this was the first generation of warfare, the ability to mass manpower.

The Industrial Age brought about the second generation of warfare, which focused on massed firepower. Technological advances brought about gunpowder, rifles, machine gun, artillery, the industries required to produce such materiel, and the railroad to transfer these huge amounts of materiel. This culminated in the stalemates of World War One (WWI) where firepower dominated manpower and defense triumphed over offense.

Third generation warfare was pioneered by the Germans in their blitzkrieg tactics. Unable to match the manpower or firepower due to the limitations imposed upon them after WWI, the Germans adopted maneuver tactics to overcome their shortcomings. Made possible by further technological advances of reliable tanks, mobile artillery, motorized infantry, close air support and radio communications, the Germans applied third generation maneuver warfare to devastating effect.

Similarly, the current state of warfare, 4GW, is driven by the four societal aspects. With globalization in full swing, Samuel P. Huntington's prediction that conflict will be predominately along ethnic and religious fault lines has been accurate for the past few decades.[10] Social psychology suggests that our identities arise not from who we are, but who we are not, compared to others.[11] Economically, resource markets have matured, wealth has been distributed

The Singapore Armed Forces in The Gulf Of Aden

around the world and transfer of resources has become easier. Socially, globalization and immigration have created social reactions ranging from discrimination to bigotry, causing non-assimilated minorities to look for ways to recover their identities. More crucially, technology has ushered in the Information Age, easing information transfer and idea propagation. These factors have led to the asymmetric character of 4GW organizations compared to conventional militaries:[12] possibly stateless, transnational, geographically unconstrained, networked, adaptive, creative, avoids high-intensity direct battlefield confrontation but chooses low-intensity strategic strikes. It imposes its will on adversaries through idea propagation and public perception—by convincing adversaries' decision-makers that their strategic goals are either unachievable or too costly for the perceived benefit.

As militaries and security agencies around the world scramble to deal with the new 4GW threat, the question becomes: can they remodel themselves in time to operate in the new environment? More importantly: can the future of warfare be predicted?

UNPREDICTABILITY AS A CONSTANT IN WARFARE

The venerable military theorist, Carl von Clausewitz, in his book *On War,* recognized that warfare is inherently uncertain and ambiguous, popularizing the term "fog of war."[13] Although third generation maneuver warfare has been around for decades, its chief proponent, the United States (US), found it inadequate to deal with evolved adversaries in Vietnam and Iraq[14]—its prediction of the future of warfare was inaccurate. With the advent of the Information Age, unpredictability about the conduct of warfare will be the key problem.

In the 1980s, Berkeley professor Rashi Glazer provided insight regarding the relationship between information and predictability, albeit in the business world, that has proven to be accurate in the following decades: "A firm is information-intensive to the degree that its products and operations are based on the information collected and processed as part of the exchanges along the value-added chain. Whereas traditional products and operations are relatively

static, information-intensive products and operations change as new data from the environment become incorporated into them."[15]

Warfighting organizations are information-intensive as military operations and capabilities are definitely based on information collected and processed about the adversary as well as the environment. Furthermore, political, social, economic and technological entities are information-intensive as well. As these environmental aspects change with influx of information, it should be expected that warfare would evolve at a rate proportionate to the ability to absorb information. With the Information Age, the time required for incorporating of information has reduced drastically. Therefore, unpredictability about the future of warfare, tactically, operationally and strategically, should be taken as the default.

THE STRATEGY: BE AN ADAPTIVE ORGANIZATION

Many organizations, born out of the Industrial Age, place a premium on efficiency and have a prescriptive culture, with a hierarchical structure to effect it. Frederick Winslow Taylor, an early proponent of industrial efficiency, was quoted as saying, "It is necessary in any activity to have a complete knowledge of what is to be done and to prepare instructions. The laborer has only to follow instructions."[16]

In the Industrial Age, this approach worked well as long as the leaders had a "complete knowledge of what is to be done." As the rate of change accelerates a fast information incorporation and unpredictability becomes the norm, it is impossible to have "complete knowledge" to follow the efficiency model. Long-term strategic plans decided by a central planning staff, disseminated through a hierarchical structure and complied in detail by subordinate units, will increasingly lead to ineffectiveness and irrelevancy.

Therefore, in face of unpredictability, the only viable strategy is to be adaptive. The SAF must plan and develop itself as an adaptive organization, not to prepare itself to fight a conventional, 4G or future war, but to be adaptive to the environment, continuously and systematically reinventing itself to achieve its desired outcomes.

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Like in natural selection, organizations will naturally evolve when the operating environment changes—as they find ways to solve new problems that arise. However, just as species that fail to adapt are dominated or become extinct, left to natural selection, organizations can also become ineffective and irrelevant. Therefore, the evolution of the SAF must be engineered. The SAF must take deliberate efforts as part of a coherent strategy to become an adaptive organization. Several key thrusts are identified to effect this strategy:

- Creating the Correct Environment for Evolution
- Knowledge Management – Sensemaking Information
- Transforming the Leadership Role
- Inculcating the Culture to Mold Behaviours
- Resolving Long-Term Planning – Modular Organizational Structure

CREATING THE ENVIRONMENT

In the natural world, survival is the basic instinct for all organisms in order to reproduce and replicate the genes within them. In parallel, for humans, tools, ideas, systems and processes evolve as practical people, consciously or subconsciously, find practical solutions to solve problems to ensure survivability. The direction evolution takes is highly dependent on the "problems" faced in the environment.

The SAF faces an important limitation in this aspect. A huge proportion of its capabilities are in the environment of training, not operations. This brings about two crucial issues to address:

The Singapore Armed Forces in Afghanistan

- If the environment in training does not match reality, the problems faced by units will be inaccurate, and they will learn and adapt wrongly. Simply put, if the wrong questions are set, the wrong answers will be given.

- Survivability is the strongest drive for adaptability. Short of creating life and death situations, the environment in training must replicate similar consequences of competition.

Therefore, in training, realistic environments must be replicated. The knowledge of these environments will come from intelligence, experience, and insights from operational units around the world. Importantly, the dynamic factor—the behavior and actions of the enemy and other stakeholders—in the environment needs to be replicated as realistically as possible. For example, in Army training, it would involve replicating the enemy, civilians, other stakeholders, the urban or close terrain, etc., accurately. Furthermore, short of creating life and death situations, Conflict Resolution (CONRES) systems need to be accurate and effective to simulate consequences and competition.

The SAF will also have to expose itself to environments beyond conventional full-scale war in the full spectrum of operations. As part of the international effort, the SAF has had opportunities to deploy units in these operational environments, for example the 2004 Operation Flying Eagle,[17] its efforts in Afghanistan,[18] and Gulf of Aden since 2009.[19] Beyond contributing to the international peace and stability efforts, these units will experience first-

hand the environments in which they can adapt and evolve, as well as provide insights to better replicate these environments back home.

Ensuring that the SAF is immersed in an accurate environment, either in training or in operations, is therefore fundamental to it adapting and evolving to real conditions, beyond providing "realistic training" for its soldiers or "contributing to international efforts." But in order to adapt, its units must also learn the lessons, draw insights and share them within the organization.

KNOWLEDGE MANAGEMENT

Seth Lloyd, the complexity scientist, argued that sensemaking is a principle of adaptive systems.[20] Paraphrased by Stephen H. Haeckel in his sense-and-respond adaptive model, the insight is that successful adaptive systems have the property of translating apparent noise into meaning at a faster rate than the arrival rate of apparent noise.[21] John Boyd's Observe-Orient-Decide-Act (OODA) Loop gives further credence to the importance of sensemaking the environment at all levels.[22]

The challenge for organizations therefore is to develop sensemaking as an adaptive competence. According to economist Brian Arthur, "The challenge to management in this game is not so much to optimize ... Instead, the challenge is to make better sense out of the situation than the next guy ... The strategic challenge here is a cognitive one ... A system that is to [adapt] successfully ... must adapt by constructing models that allow it to decide what information to get, and how to act on it."[23]

In his 1995 book *The Knowledge-Creating Company*,[24] Ikujiro Nonaka warned against defining knowledge as simply hard, quantifiable data, and limiting the organizational competence to simply processing and disseminating information. He argued that creating knowledge in an organization is key, and depends on tapping the insights, intuitions and ideals of its people. Out of this was born the discipline of knowledge management, which involves the organizational competence to sensemake the environment by identifying, creating, distributing and adopting insights and experiences.

Realistic Training Environment

The SAF today has come a long way in developing this organizational adaptive competence of sensemaking. Since the Learning Organization (LO) was introduced in 2000,[25] the culture of learning from operations, training and activities is widespread within the SAF. The SAF's Center for Leadership Development (SCLD) is currently refining the framework for the Action Learning Process (ALP) and its conduct for units and commanders. Assuming that the training and operational environment is realistic and accurate, the SAF and its units have developed the competence to draw lessons and insight from its experience.

However, the SAF is limited by sheer size. Knowledge created is often difficult to share and adopt. Nor does it suffice to simply archive knowledge in a huge database for access. As the environment changes unpredictably, knowledge can easily become outdated. As David H. Petraeus included succinctly in the *Counterinsurgency Field Manual*, "if a tactic works this week, it might not work the next week; if it works in this province, it might not work in the next."[26] The SAF, as it manages knowledge, must develop a system beyond archiving; it must be able to ensure relevance and allow ease of access.

The Internet provides illuminating examples on knowledge management. The most useful sites on the Internet: Google, Wikipedia, Facebook, and even TripAdvisor, do not simply create and archive knowledge or attempt to draw relevance on their own. In their own domains, they allow their users to self-manage and determine what is relevant at a specific point in time—Google with its PageRank algorithm and Facebook with its NewsFeed algorithm,

for example. Google outlines its search technology through four principles:[27]

- **Relevance** – using algorithms including PageRank to determine the importance of a web page at any point in time.

- **Comprehensiveness** – integrating all possible web pages, including images, videos, news, books, etc.

- **Freshness** – updating its archive in minutes.

- **Speed** – fast response time to facilitate ease of access.

The SAF can leverage on LEARNet infrastructure to create such a system for knowledge management. The potential power of LEARNet is not its ability to teach lessons electronically through an interactive medium—this is merely applying old ideas to new technology. Using the LEARNet's networked medium, its true potential lies in the possibility of a modern knowledge management system:

- Allowing users to upload lessons and insights to be **shared** across the network, archived to ensure comprehensiveness and freshness;

- A **search** engine that is accurate and fast to ensure relevance and ease of access;

- A **peer review** and commenting system to gauge relevance and quality (similar to Facebook's Newsfeed "Like" and "Comments" functions);[28]

- A **clean, easy design** encompassing the above to encourage its use.

TRANSFORMING THE LEADERSHIP ROLE

It has been argued that with constant unpredictability, Frederick Taylor's model will not hold up and central planning groups are increasingly ineffective. However, the other extreme is that decision-making is decentralized, with leaders merely articulating vision and values. Some business companies have tried this without success—because interpretation of vision and values is different at different levels, there is no coherence within the organization—these companies become more chaotic instead of more adaptive.[29] Friedrich Hayek, the visionary economist, articulated this in his 1945 paper *The Use of Knowledge in Society*: [30]

If … the economic problem of society is mainly one of rapid adaptation to changes in the particular circumstances of time and place, it would seem to follow that the ultimate decisions must be left to the people who are familiar with the circumstances … We cannot expect that this problem will be solved by first communicating all this knowledge to a central board which, after integrating all the knowledge, issues its orders. We must solve it by some form of decentralization … But the "man on the spot" cannot decide solely on the basis of his limited but intimate knowledge of the facts of his immediate surroundings. There remains the problem of communicating to him such further information as he needs to fit his decisions into the whole pattern of changes of the larger economic system.

The leadership role is therefore to bridge this gap between decentralization and coherence. Haeckel in his sense-respond adaptive model proposes two main roles for leadership to provide context and coordination.[31] Contextualized to the SAF, it can be paraphrased as follows:

1. **Providing Context for Subordinate Decision Makers**

   a. Articulate purpose and desired outcomes

   b. State governing principles and boundaries

   c. Establish relationships between subordinate units

2. **Providing Coordination and Accountability**

   a. Coordinate the outcomes owed between subordinate units and Higher Headquarters (HHQ)

   b. Hold subordinate units accountable for these outcomes

First, leaders are responsible for providing the context for their subordinates to make decisions. This hinges strongly on the purpose of being and desired outcomes required from the subordinate units. Leaders will keep the subordinates' decisions aligned by articulating broad governing principles and strict, specific boundaries. Also, leaders are required to educate the subordinates of the organizational design, so that they understand the relationships between each other and HHQ, and the outcomes owed to each other.

Second, after providing the context, leaders need to ensure coordination and accountability. The leader will coordinate the outcomes owed between subordinate units. Furthermore, leaders will ensure that the outcomes owed between units manifest by holding their subordinates accountable for these outcomes.

Given this context, subordinate leaders are free to utilize the knowledge, resources and people at their disposal to creatively achieve the desired outcomes. The concept of building an organization capable of performing in a fast-moving, unpredictable environment by fostering both high alignment and high autonomy is not new—the Prussians developed it in the 1800s—and the culture and practices became known as *Auftragstaktik*, or Mission Command.[32] The SAF will do well to return to military roots in the new environment. Adopting the practices is easy, creating the culture is not—the Prussians themselves took decades to achieve it. The SAF will require a fundamental shift in its culture within leadership schools and the larger organization as a whole.

INCULCATING THE CULTURE TO MOULD BEHAVIORS

In order to fully utilize a functional knowledge management system, and to transform the role of leadership in the organization, the organizational culture needs to shift fundamentally. The SAF and its people must shift from an authoritative, hierarchical and prescriptive culture to one that is collaborative, flexible, resourceful, empowering and accountable. To achieve this cultural shift, systems will need to be adjusted to offer incentives for the desired behaviors. One system that can be adjusted to encourage such behaviors is the organizational human resource management system—specifically the performance evaluation and feedback process.

Currently, the SAF's performance evaluation process is strongly top-down with superiors ranking their subordinates annually based on their perceived performance. This process prompts the subordinates' behavior to align themselves strongly with their superiors, sometimes at the cost of their adjacent units and their own people. Also, the expectations the superior has can be prescriptive—to get what he wants done—with no regard for feedback from the ground. The incentive model is inconsistent with the desired behaviors in an adaptive organization.

The SAF has adopted a 360 degree feedback system through Multi-Source Leadership Feedback (MSLF) for Regular senior commanders.[33] This process can be expanded as part of the evaluation to drive behaviors and therefore cultural change towards an adaptive SAF.[34] Leaders will be encouraged to have strong alignment with HHQ to deliver the desired outcomes, to build collaborative relationships with their peers by sharing and adopting knowledge, and to empower their subordinates by setting the context and then giving them autonomy.

RESOLVING THE ISSUE OF LONG-TERM PLANNING: A MODULAR ORGANIZATIONAL STRUCTURE

There are some realities that the SAF faces that, unlike a business, makes its transformation to an adaptive organization difficult. One of it is in the area of capability development. If the argument is that there should be no other strategy beyond being adaptive, what will drive the development of new capabilities, since its development needs to be projected years in advance? If the SAF cannot and should not predict the future of warfare in twenty years' time, how does it decide what capabilities to build today?

The solution here is to ensure the modularity of the SAF's organizational structure—units should be modular, have clear capabilities and have a "plug-and-play" interface with other units.

The solution here is to ensure the modularity of the SAF's organizational structure—units should be modular, have clear capabilities and have a "plug-and-play" interface with other units. Units can then combine with any other number of units under a unified command to achieve different desired outcomes. The development of a new capability will be driven by the knowledge and information gleaned in today's environment. However, if it is developed with modularity in mind, it can collaborate with existing units to provide outcomes, even if the operating environment has changed by the time development has finished and it is introduced. The development of capabilities cannot be stand-alone or they lose their relevance even before they are ready. Instead, they

must be involved in an iterative process of "plug-and-play" to cater to the changing environment.

Modularity is also an inherently flexible and adaptive structure. Based on the type of situation and the desired outcomes required, modular units can be combined or separated to form organizations. After 9/11, the US found success with the modular Incident Command System for emergency response operations, where the organization can expand and contract as required by the incident scope and type.[35]

CONCLUSION

This essay has argued for the need to build strategic adaptability in the SAF and explored five key initiatives towards that transformation. These recommendations provide broad insights and are neither exhaustive nor prescriptive in nature. What is certain is that in an age where all aspects of society, including the conduct of warfare, are changing faster than anyone can accurately predict, it is imperative to transform the SAF into an adaptive organization capable of achieving its mission. In the natural world, *homo sapiens* did not plan centuries in advance to dominate their environment, but evolved to do so. The SAF needs to force its own evolution to ensure its continued dominance and relevance. ☯

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