POINTER

V30N2

CDF Essay Competition 2003

***POINTER* is pleased to announce the 17th Annual Chief of Defence Force Essay Competition. The competition aims to encourage SAF officers to conduct research on professional and military-related issues relevant to the SAF to enable our Officer Corps to move towards excellence.**

Rules

1. The Competition is open to all SAF officers and Warrant Officers (Regulars, NSF, NSmen and Officer Cadets), DXOs and DSTA personnel.

2. Entries may be submitted as an individual or group effort, however the entries must be unpublished work.

3. The essays should be between 2,000 to 4,000 words, typewritten, double-spaced on A4-size paper with all pages numbered.

4. The **official cover sheet**, properly filled in, must accompany each entry. Entries unaccompanied by the cover sheet will be disqualified. The entry form is available from the*POINTER* intranet and internet websites. The writer's/writers' name(s) should not appear in the essay itself.

5. All entries must include detailed footnotes/endnotes and a bibliography.

6. The closing date of the competition is **31 Dec 2003**. Entries which do not comply with any of the competition rules will be disqualified.

7. The essays will be assessed in confidence by an independent panel of judges. No appeals will be entertained. Results of the competition will be announced in May 2004.

8. The Editorial Board reserves the right to edit essays selected for publication.

9. For further information, please call the Editor at 799-7410 or Assistant Editor at 799-7409 or e-mail them at the SAFTI MI HQ address.

Topics

10. Entries may be submitted on any of the following subjects:

- Military strategy and tactics
- SAF doctrinal development and concepts
- Professionalism, values and leadership in the military
- Military campaigns or history and their relevance to the SAF
- Personal experiences in combat operations, peacekeeping operations or overseas training
- Defence management, administration and organisational change
- Regional geopolitics and strategic issues
- Defence technology

Prizes

11. Prizes will be awarded as follows:

- First prize $1,500 and a plaque
- Second prize $1,000 and a plaque
- Third prize $500 and a plaque
- 7 Merit Awards $300 each and a plaque
- 10 Commendation Awards $300 each
  - **CDF Essay Competition 2002: Breakdown of Entries by Service Status, Rank and Topics**
-

Participation by Service Status	
Regular	109
NSmen	5
NSF	4
DXO/DSTA	2
TOTAL	120

-

Participation Level by Rank	
OCT	1
2LT	9
LTA	26
CPT	49
MAJ	29
LTC	3
DXO/DSTA	3
TOTAL	120

-

Breakdown of Topics	
Geopolitics	16
Leadership/Core Values	22
Management	25
Doctrine	12

Technology	20
Strategy	12
War Studies	11
Personal Experiences	2
TOTAL	120

Editorial

We are pleased to announce the results of the 16th CDF Essay Competition 2002. First launched in 1987, the competition aims to encourage SAF personnel to research and write on professional issues. 120 entries were received for the 2002 competition with the topics of defence management and organisational change, leadership and military technology leading the pack.

The top essay, *Psychological Dimensions of Peacekeeping: The Role of the Organization*, by CPT Stanley Chua Hon Kiat, looks at psychological issues that arise in the various phases of a peacekeeping operation and argues for comprehensive organizational efforts to address those issues so as to better prepare peacekeeping troops for their duties.

The second prize goes to *Balancing Change and Continuity: Some Thoughts on the Transformation of the SAF*, by MAJ Roland Ng. This essay explores key drivers, possible continuities and discontinuities that the SAF should be aware of as it seeks to transform. It goes on to sketch a framework to balance between the need for stability and for change as well as between current requirements and future needs.

Occupying the third spot is *Ingredients of Change: A Recipe for Transformation* by MAJ Lim Tuang Liang. It draws on history for key characteristics of military transformation, proposes some mechanisms for successful transformation and warns of pitfalls from failed efforts to transform.

The seven Merit Award essays include *Manoeuvre Warfare: Lessons from the Boardroom for the Battlefield* by MAJ (NS) Seet Pi Shen. This essay argues that, in this era of greater complexity and uncertainty, the SAF can benefit from the lessons of commercial "warfighting" to realise the true potential of a dislocation conception of manoeuvre. Taking another view, *Competing to Stay Ahead: Interservice Competition as a Solution and not a Problem*, by MAJ Kwek Ju-Hon, argues that interservice competition, framed within the correct parameters, can be a powerful source of innovation for militaries. *Countering the Fog and Friction of War in the Information Age*, by MAJ (NS) Aaron Chia, discusses the two classic Clausewitzian concepts in the light of information communication technologies and how they can be minimised. LTA Kelvin Fan poses the question: *Will China Attack Taiwan?* He argues that most studies on this issue concentrate overly on military capabilities and proposes an answer drawn largely from the perspectives of military procurement and political will.

Due to space constraints, we are unable to publish the remaining three Merit Award essays. *Biomimicry: A Model for Solving Military Problem*, also by MAJ (NS) Aaron Chia, examines how militaries can learn from nature and its denizens. *Uninhabited Combat Aerial Vehicles: A Solution for the SAF?*, by MAJ Geoffrey Kee Jin Leong, considers the advantages and disadvantages, as well as the challenges, of using UCAVs. *Arguments Without End: The Political Economy of Free Trade Agreements in the Asia-Pacific*, by LTA (NS) Toh Boon Ho, looks at the debate over whether FTAs are stumbling or building blocks of trade, their role in the economic and security policies of ASEAN member states and the major Asia-Pacific powers.

You can also read the synopses of the ten Commendation Award essays in this issue. Congratulations to all the prize winners and we appreciate the effort of those readers who have sent in entries.

On a final note, we would like to inform our readers that after one year of revamp efforts, the new *POINTER* will be launched in September 03. The new *POINTER* aims to facilitate the broader effort to effect knowledge management in MINDEF and SAF. Our readers can look forward to a better quality journal, both in content and design, from the issue onwards. We encourage our readers to give their views on the revamped journal either by writing letters to the editor or by participating in the Internet discussion forum (http://www.miw.com.sg/communitytools/forum). We award up to $80 for each letter published.

Editor, *POINTER*

Psychological Dimensions of Peacekeeping: The Role of the Organization

by CPT Chua Hon Kiat Stanley

The success of a peacekeeping operation hinges upon the soldiers who are deployed to undertake the mission. Unfit personnel, both physically and psychologically, compromise the ability of the detachment to accomplish its tasks. In 1978, an Austrian soldier killed two of his sleeping comrades while being deployed for peacekeeping at the Golan Heights. More recently, in 1993, a 16-year-old Somali boy died as a result of ill-treatment at the hands of a few Canadian peacekeepers. Needless to say, the repercussions of such incidents transcend far beyond their tactical implications, posing dramatic ramifications even at the strategic level. In peacekeeping operations, therefore, the compressed distance between strategic and tactical decision-making dictates that nothing be left to chance with regards to the selection and preparation of peacekeepers.

The nature of peacekeeping deployments has transformed significantly over the last decade. Whereas earlier operations entailed overseeing the implementation of peace agreements between formerly warring nations, many recent missions have taken the form of humanitarian intervention, often in circumstances where peace is yet to be established. Consequently, the situations that confront deployed peacekeepers are increasingly volatile, often permeated by a climate of violence and intimidation. In addition, peacekeepers are required to cope with stressful living conditions, the absence of family and loved ones, and the tacit awareness that returning home remains a distant prospect. As an institution that upholds the duty of care over its soldiers, especially in such a scenario where mental health may be compromised by operational service, the careful management, psychologically, of deployed personnel is an organizational imperative.

In this article, I will explore the psychological dimensions of peacekeeping missions. The course of deployment will be discussed in four phases, namely:

- screening and selection phase
- pre-deployment preparation phase
- deployment phase
- post-deployment phase

The psychological issues that emerge during each of these phases will be analyzed in relation to the organizational efforts that are needed to tackle these concerns. Where relevant, I will present evidence from the peacekeeping literature, even if the locations of some of this research, such as Rwanda and Bosnia, are not exclusive to those where the SAF currently deploys our forces. Nonetheless, I believe that this must be the sensible approach, since restricting the discussion to only our present commitments will be making an implicit, but invalid, assumption about the countries that the SAF will ever deploy its soldiers to.

Screening and Selection Phase

"Stability, maturity and reliability. I want someone who understands what he is getting into, and is capable of communicating that to others. He must be part of the group, and open to discussing problems. He needs the ability to reach outside himself and do other jobs as well. He can't be a specialist; he has to be able to rely on everybody. Finally, he must have a stable family life."

Australian Army Peacekeeper in Iraq[1]

The common tendency for decision-makers to place excessive emphasis on technical competence reflects the flawed assumption that ability is invariable across the countries and cultures in which an individual is deployed. Hence, the central tenet of the screening and selection process holds forth that other factors, such as personality traits and cross-cultural suitability, should similarly be accorded their due consideration. For

instance, personnel who suffer from depression, or who are prone to interpersonal conflict, are at risk not only to themselves but also to other soldiers deployed for peacekeeping, and they should therefore be rejected. In this section, I will consider four factors personality traits, "soft" skills, cross-cultural suitability and home life all of which are known to contribute to the success, and failure, of a peacekeeping operation.

While the possession of "ideal" personality traits does not ensure accomplishment of a mission, it does, however, enhance the odds of success. To this end, a study of Australian peacekeepers has shown that the qualities of stability, maturity and reliability are the greatest personal assets that a peacekeeper could possess.[2] These attributes are essential not only for their direct contribution to the mission, but also in the interpersonal context of sustaining the effectiveness of the group. Other positive traits that contribute to successful performance include physical and mental hardiness (i.e., the ability to perform under situations of stress and sickness), an easy-going personality, possession of a sense of humour, and a positive motivation towards the deployment. On the other hand, a range of negative characteristics has also emerged from the study. For instance, overly aggressive and arrogant peacekeepers are found to be liabilities in interactions with the host people; personnel who are prone to anger are unsuitable in a peacekeeping role which demands patience; and the stereotypical military behaviour associated with dogmatism and regimentation is discordant with the attributes of flexibility, adaptability and compromise required in a peace operation. Findings of this nature necessitate a screening and selection process that takes into account the personality factors known to be desirable in peacekeepers.

In a peace operation, a soldier is not simply a soldier, but also a third party mediator, ambassador, teacher and peacemaker. This multitude of assumed roles render the technical "hard skills" the focus of conventional military preparation less useful than what has been referred to as the "soft skills" of interpersonal interaction and problem-solving.[3] Research has consistently shown that two of the strongest predictors of success in peacekeeping operations are team skills and problem-solving skills.[4] Team skills include openness to exchanging ideas, the ability to resolve conflict in an appropriate manner and the willingness to seek compromise. In turn, problem-solving skills relate to the ability to foresee and identify problems, develop innovative solutions with limited resources available, and the disposition to think laterally in the generation of ideas. As a criterion of selection, personnel identified to be lacking in "soft skills" need not, however, be immediately rejected, because unlike personality traits which tend to be enduring, such skills can be nurtured within a relatively shorter period of time. Other than the most extreme cases, therefore, screening and selection need only to identify, not eliminate, candidates who need to be equipped with these "soft skills".

The third focus in screening and selection relates to cultural awareness. Peacekeeping missions require extensive interaction with the local populace, and the ability of personnel to appreciate differences in other cultures constitutes a vital success ingredient. The following comment made by an Australian peacekeeper in Mozambique illustrates the point aptly: "We need to respect their customs and traditions and so forth, accept their differences of opinion. This ranges from their sexual practices with kids to the acceptance of corruption. While not acceptable to us, it is just a way of life for them."[5] Moreover, the scope of cultural interaction confronting peacekeepers is not restricted to that with the host nationals, but also includes a multiplicity of cross-cultural engagements with personnel from other units, vocations, services, professions and nationalities. Given the wide acknowledgement that cultural sensitivity is a feature of training rather than selection,[6] the range of cultural issues in peace operations will be discussed more comprehensively in the next section on pre-deployment preparation. In relation to the present phase of screening and selection, consistent with the approach advocated for "soft skills", personnel found lacking in cultural awareness need not be rejected; instead, they could be sent for obligatory cultural preparation.

The fourth and final aspect of screening and selection pertains to the individual's home life. In an investigation of Austrian peacekeepers, events such as the death, divorce, or pregnancy of one's partner are found to result in considerable damaging effects on the psychic stability of personnel deployed for peacekeeping missions.[7] The study also revealed that the heaviest burden felt by soldiers during deployment relates to their family problems back home. Indeed, experience has shown that when soldiers are deployed for operations with unresolved personal issues, even if they successfully complete the mission, the repercussions of their absence are often felt when they return home eventually. On this note, it may be

prudent that the organization reconsiders selecting personnel who are vulnerable to facing difficulties with family life when deployed overseas.

A comprehensive screening and selection procedure would need to take into account the above factors. As mentioned, these assessments should not be designed with the plain objective of disqualifying candidates, but more crucially, to identify the ones who are in particular need of assistance. In the next section, I will describe the various forms of pre-deployment preparation that is necessary prior to undertaking a peacekeeping operation. In my account, I will also highlight some of the psychological concerns that are expected to confront a prospective peacekeeper during this time.

Pre-deployment Preparation Phase

The time after selection, and prior to the deployment, is focused on the training and development of the selected personnel for the peacekeeping mission. To assume that a soldier trained in conventional warfare is sufficiently prepared for a peacekeeping role would be to overlook the extensive differences in the behaviours and skills needed between military and peacekeeping operations. Specifically, traditional military operations entail no contact with civilians; rely on military skills; aim at destroying opposing armed elements; have an identified enemy; and work towards the final state, that is, a military victory. In contrast, peacekeeping operations require immense interaction with civilians; rely on contact skills; aim at negotiation with opposing armed elements; adopt an impartial role with no identified enemy; and work towards the final state of resolving underlying conflict causes.[8] Evidently, the skills required in a peacekeeping role are the very antithesis of those required for war. In this section, I will argue for three specific forms of pre-deployment preparation: cultural training, stress-related preparation, and conflict resolution/negotiation skills training.

- ## Cultural preparation

     Cultural contact in the peacekeeping domain is often understood as the interaction that transpires between the host people and peacekeepers. However, this is not the full story. Instead, peacekeepers are faced with a series of consecutive "cultural immersions", each of which introduces new behaviours and norms that require adaptation to.[9] First, cultural incompatibilities may be experienced with the formation of a composite unit. A contingent of peacekeepers comprises not only infantry troops, but also personnel from other vocations, such as medical, logistics and administrative staff. Second, the integration of Navy and Air Force personnel into a setup dominated by Army procedures and practices calls for cultural adjustments on the part of all peacekeepers in order to overcome the cultural differences between services. Third, peacekeepers may encounter difficulties in assimilating the predominantly civilian cultural norms of the United Nations (UN) and the Human Relief Organizations, which have little in common with those of the military establishments. Fourth, interaction with the host culture may present a reality that contradicts pre-expectations, challenging peacekeepers to re-define their prior perceptions. Finally, contact with peacekeepers from other nationalities requires considerable cross-cultural adaptation, as differences in the various professional military cultures must be overcome if the multinational force is to operate effectively. The corollary of these "cultural immersions" is that mission performance may be impaired due to difficulties in surmounting the diverse range of cultural hurdles.

     The cultural barriers encountered by peacekeepers are exacerbated by communication differences, both in the verbal and non-verbal domains. In relation to verbal discourse, differences in language hamper interaction, sometimes resulting in misunderstandings and misinterpretations. Relating his experiences as Military Advisor in Afghanistan, LTC Lo Yong Poo (1999) recalled: "some of my attempts at establishing good rapport with the locals were somewhat undermined by my inability to speak and understand their languages. Relying on a local interpreter meant that nuances and intentions were sometimes lost in translation, or even misinterpreted by the translator himself."[10] The difficulties with language, in turn, necessitate greater reliance on non-verbal forms of communication. However, unless the individual is well acquainted with the subtle differences in non-verbal behaviour related to body movements, facial expressions, gestures, eye movements,

etc., the quality of interaction may degenerate even further due to the transmission of unintended signals.

The cultural preparation of peacekeepers must be designed with these issues in mind. To this end, there are commonly two aspects of cultural preparation. The first relates to the provision of specific information about the people and cultures with whom peacekeepers will interact. This refers to language lessons and knowledge training, which involves the provision of information related to the history, geography, politics, economics, communication styles, entertainment practices, gift-giving customs, body language, etc., of the interacting countries and cultures. The second aspect of preparation pertains to the development of a more generic quality of cross-cultural adaptability. Given the diverse range of "cultural immersions", and the fact that peace operations consistently require personnel to deal with novel problems in novel contexts, a generic ability that transcends specific knowledge about the culture may prove more instrumental in facilitating mission accomplishment. As noted by an Australian peacekeeper in Sinai, "his training needs to be such that he is adaptable enough to cope with the different environments and situations".[11]

• **Stress-related preparation**

Stress-related preparation of peacekeepers consists of two aspects. The first aspect aims at equipping personnel with the ability to manage the psychological stress that is likely to be experienced during the deployment phase. The second aspect deals with organizational efforts to reduce the anxieties that are encountered prior to a deployment, so that personnel embark on the mission in a state of high psychological-readiness. These two forms of stress-related preparation will now be discussed.

Peacekeeping missions conducted under UN mandate, even those of a predominantly humanitarian nature, may occur under extremely difficult stress conditions.[12] Especially in the war torn countries, deployed personnel are often exposed to the massive scale of human degradation and misery. The strategic nature of most peace operations also prohibits the possession of weapons even for contingencies of self-defence, thereby seriously aggravating the threats to personal safety. In a study of Rwandan veterans, 77 percent of former peacekeepers reported having seen dead bodies, while 79 percent believed, at some point of the deployment, that they were in grave danger of being killed.[13] The full range of stress factors encountered in a peacekeeping mission will be elaborated in the next section on the deployment phase. At this moment, the point to note is that a range of potentially traumatic events confronts the soldier in a peace operation, and the ability to handle the resultant stress is vital for preventing the onset of any psychological or emotional repercussions. Whereas post-deployment efforts constitute curative measures, the ability to manage stress, as and when it occurs, serves as a preventive defence mechanism. For this reason, training in stress management is imperative.

In relation to the stress encountered by soldiers prior to deployment, an investigation of Australian peacekeepers in Rwanda showed that the most stressful period of an operation was the pre-deployment phase.[14] This may stem from the fact that long hours are dedicated to planning and preparing for the mission, thus leaving soldiers with little time to attend to personal matters. A significant source of stress also arises from issues about family well-being, ranging from the moral dilemma of staying behind to care for a new-born child or ageing parents, to concerns that the family would be left isolated and unsupported. Finally, career anxiety is a common phenomenon, as personnel fear being "out-of-sight, out-of-mind", and consequently losing out on opportunities for promotion, or of securing the "plum" positions back home. Importantly, the organization plays a key role in helping to overcome these issues. Problems with time, for instance, may be eased by taking over the troublesome administrative matters; family concerns may be alleviated by restricting deployment periods to reasonable duration; and implementation of mentoring schemes can allay fears of being forgotten. The institution of such small, but significant, measures can have a disproportionate impact upon the psychological preparedness of personnel entering the mission. This would, in turn, determine their performance in the operation.

- ## Conflict resolution/negotiation skills training

The final category of pre-deployment preparation focuses on the skills needed for negotiation and conflict resolution. Illustrating the point that such skills are not nurtured through conventional military training, Hansen *et al* (2000) employed the familiar task of conducting a search operation to highlight the contrast: "In combat operations, the standard technique for opening a door of a building in such operations is simply to blow it open. Peacekeeping forces must now approach the same task using the far more difficult technique of persuading the occupants to open the door!"[15]

The emerging nature of peacekeeping operations is one that entails close interaction with the local populace who may, or may not, be kind to the presence of international forces in their country. Notwithstanding the existence of antagonistic factions, peacekeepers are frequently called upon to perform a range of tasks, including the control of hostile crowds, the distribution of humanitarian relief to civilian populations, and the disarming of local militias under the terms of a peace agreement. At times, peacekeepers may also be asked to mediate or arbitrate in a range of local disputes. Clearly, the accomplishment of each of these tasks requires the judicious use of negotiation skills at the tactical level, both in order to secure mission objectives as well as to ensure personal safety. It is therefore an organizational responsibility to equip its personnel with these skills.

In this section, I have proposed that three forms of pre-deployment preparation be administered to prospective peacekeepers: culture-related training, stress-related preparation, and conflict resolution/negotiation skills training. Being properly equipped with these skills not only allows peacekeepers to embark on the operation in a prepared frame of mind, it also helps to ensure their physical and psychological well-being during the deployment phase. The next section will focus on the types of problems that are known to confront peacekeepers as they move into the deployment phase of an operation.

Deployment Phase

Once deployed in the operational theatre, peacekeepers are challenged with a set of issues that are fundamentally different from those encountered prior to deployment. Factors pertaining to living conditions, working conditions, risk levels and support conditions have the capacity to induce severe levels of stress.[16] If not effectively managed, such stressors may deteriorate not only the individual's performance during the mission, but also his long-term psychological well-being. In this section, I will describe the types of stress present in the peacekeeping environment, and the measures that can be undertaken to address them.

One of the key sources of stress, particularly during the first month of deployment, relates to the often spartan living conditions associated with peacekeeping assignments. Harsh weathers, crowded and confined living quarters, lack of privacy, poor facilities for leisure activities and fresh product shortages, are common complaints during the early deployment phase. This point had also been raised by LTC Lo Yong Poo (1999), who, reflecting on the conditions in Afghanistan, noted:

"in the country, standards of hygiene and sanitation were rather low. As a precautionary guide, tap water had to be filtered and boiled for at least 20 minutes before drinking or teeth-brushing, and fruits and vegetables thoroughly cleaned and sterilized before cooking. Consumption of cooked foods sold in Afghanistan was strongly discouraged. All meals were to be consumed preferably at the UN residences. Everywhere, poor infrastructure and the lack of modern facilities and health services reflected the poverty as well as the extent of damage inflicted by the war."

The second source of stress stems from the difficult working conditions.[17] The initial stage of deployment is commonly characterized by intense activity, heavy workload and long work hours. As things become stabilized, however, boredom and monotony soon take over as the new factors of stress. In addition, an unstable pace of work, unpredictable work schedules, and the occasional gripe that being sent on an overseas assignment is tantamount to being placed on 24-hours duty, all contribute to the range of

problems faced by peacekeepers. Finally, issues of cohesion, dissatisfaction with superiors, and the inability to get along with other nationals in the contingent are also significant factors that contribute to the high levels of stress.

As noted earlier, the majority of Australian peacekeepers who were once deployed in Rwanda believed that they were in real danger of being killed at some point during the deployment. In a peacekeeping mission, threats to personal safety may be present in the form of a hostile local population, or through the danger of being caught in the midst of a cross-fire between warring factions. In an investigation of French peacekeepers in the former Yugoslavia, 55 percent of peacekeeping units were exposed to frequent, or at some places even permanent, strikes from light weapons and mortar.[18] In addition, it was found that the risks to personal safety were exacerbated by the lack of shelters and the poor evacuation conditions. Overall, the fears and anxieties evoked during peace operations constitute a severe and chronic source of stress to peacekeepers throughout the mission. The following account by LTC(NS) (Dr) Tan Chi Chiu (1999), mission leader of the SAF Ops Nightingale team during the Gulf War, provides a vivid illustration of the situation:[19]

"The first major salvo of SCUDs were fired into Saudi Arabia on the night the main body of Operation Nightingale arrived. Within hours of our deployment in Camp Nightingale at 2300 hrs on 20 January 1991, the first warning came over the tannoy. It turned out to be a false alarm, but served as a valuable rehearsal for the real attack at 0100 hrs. We joined the British inside the nearest building with protective equipment on. Just as we rushed indoors, the sonic boom of Patriot missiles launched from the battery near the camp shook the whole building. We lay prone and almost immediately there were explosions overhead followed by the thuds of SCUD and Patriot fragments falling around us. The 'red' alert went to 'black', which denoted a risk of chemical contamination. It hit home that this war was deadly serious; and for the first time we were in imminent danger of being killed through conventional or chemical means."

Finally, stress may be induced by negative support conditions. In a study of American peacekeepers in Bosnia, the sense of being cut-off from one's family, and the feeling of being far away from things familiar, emerged high on the list of troops' concerns, especially during the mid-deployment phase.[20] This negative sentiment is aggravated by the tacit awareness that going home remains a distant prospect. In addition, the lack of appreciation from the host people, as well as lack of recognition from commanders both at the mission site and at home, may also inflict significant disappointment on the peacekeepers.

It is pertinent to note that some of the concerns raised in this section can be alleviated by measures that have been recommended for the earlier phases. For instance, personnel who are prone to family problems could be identified during screening and selection, and either be rejected or psychologically prepared. By virtue of selecting only individuals with a positive motivation towards the deployment, this measure would, in its own capacity, cushion the negative effects of the poor living and working conditions. In turn, training in stress-management would equip peacekeepers with the psychological and emotional resilience to withstand conditions of immense stress. Hence, if the appropriate measures were adopted prior to deployment, a significant portion of the problems presently highlighted could be avoided.

Notwithstanding this, there remains considerable scope for countermeasures to be instituted by the organization. For instance, concerns about lack of privacy may be eased by configuring living quarters to provide privacy barriers; work monotony can be overcome by conducting special events such as picnics or barbeques; the need for acknowledgment can be fulfilled by utilizing the media recognition; and family issues can be addressed by having improved mail and phone access.[21] The provision of psychological support either as on-site teams stationed at the operational theatre throughout the deployment, or as "fly-in" teams who are sent as and when required, will also assist in managing the psychological aspects of the operation. Given the importance of sustaining the mental health of personnel throughout the duration of operations, it is critical that the organization implements such countermeasures to assist the peacekeeper in overcoming his problems.

Post-deployment Phase

Compared to the time prior to deployment, the post-deployment period is a relatively neglected phase. This is largely due to the implicit, but mistaken, assumption that peacekeepers who finally return home after a deployment are naturally contented. Indeed, even though homecoming may be a much-awaited event, it is also, paradoxically, a highly stressful time. In an investigation of US peacekeepers, it was found that those who returned from peace operations in Somalia suffered a higher risk of contracting mental health problems compared to those who were not deployed.[22] To the same extent, it was shown that a sizeable number of Australian peacekeepers who returned from (then) East Timor had to be referred for follow-up counselling.[23] Against this disquieting background, I will describe the concerns that are often faced by returned personnel, and the role of the organization in addressing these issues.

By far, the vulnerability to post-traumatic stress is the most significant concern. As noted earlier, peacekeepers are exposed to a range of potentially traumatic events, including constant threats to personal safety and regular exposure to widespread human misery. If not appropriately managed, these experiences may translate into severe distress upon completing the mission.[24] Thus, it is crucial that the organization be cognizant of this, and to closely monitor the psychological health of returned peacekeepers. Those identified to be in need of assistance should, in turn, be administered further counselling and psychological intervention. Bearing in mind that the completion of a peacekeeping mission does not signify the end of a soldier's military career, restoring the affected individuals back to mentally-ready states must therefore remain an organizational imperative.

The difficulty of reinstating disrupted social networks constitutes another key area of concern. By being deployed overseas, social networks established with friends and colleagues at home risk being disrupted. The time spent away could mean that close friends become distanced, while familiar work colleagues get posted elsewhere. The consequence of this is aggravated by the fact that social support plays a key role in preventing the onset and development of traumatic disorders.[25] These findings, then, suggest that subject to operational constraints, existing units or formations should be selected as a whole for a peacekeeping mission. The advantages of doing so are that the deployed personnel would be well-equipped with the social support networks that act as psychological defence mechanisms both during, and after the operation. Further, by providing opportunities for which peacekeepers can discuss their reactions to difficult events with others who share similar experiences, the psychological and emotional repercussions known to result from such encounters may well be avoided.

Finally, a range of other problems are known to confront returned personnel. One of these is career anxiety, which arises from the fear of being placed in a mediocre appointment as a result of being forgotten when posting decisions are made. At times, the difficulty of re-adjusting back to the home work culture may also be experienced, as expressed by the sentiment: "I've done my bit and going back to a non-operational military job just won't be the same."[26] In addition, problems may arise with one's family due to the spell overseas, and this is especially important in view of its consequences on the individual's social support network. In response to these issues, mandatory debriefing upon return would be valuable by reassuring soldiers of their continued importance and role in the organization. In turn, the provision of counselling services will assist returned personnel in re-integrating their home and working life.

It is crucial that the organization recognizes the significance of these post-deployment measures, because not only do they minimize the long term negative effects of operations, they also aid in restoring the psychological readiness, hence operational capability, of returned soldiers. While peacekeeping forces are involved in a range of potentially traumatic events, it is the manner in which they are managed during the aftermath that ultimately determines whether these experiences turn into long-term psychiatric problems. Moreover, it must be borne in mind that even if problems in the post-deployment phase have no immediate bearing upon the completed mission, how they are handled by the organization will influence the attitudes of future personnel embarking on peace operations.

Conclusion

The former Chief of the Australian Army once remarked that "if we train for war we can easily handle the support for peace operations."[27] For many years, this view was upheld by military organizations who were

convinced that a soldier prepared for war was similarly equipped for a peace operation. In this essay, I have argued that while the fundamental skills, knowledge and qualities of a combat soldier remain the cornerstones for success in peacekeeping, they must be complemented by a range of organizational measures aimed at preventing or moderating the effects of any negative experiences that peacekeepers may face. These measures need to be instituted as early as during the screening and selection phase, carried on through the phases of pre-deployment and deployment, and terminate only *after* the post-deployment phase.

Being deployed for a peacekeeping operation can be a life-changing experience. For some, it may bestow greater value to their lives back home; for others, it may leave memories and feelings that they struggle to live with throughout their lives. Which one of the two outcomes eventually confronts the peacekeeper depends a great deal on the measures that are instituted by the organization.

Endnotes

1 Quoted from MAJ Schmidtchen, D. (1997) "What makes a successful peacekeeper: Australian's peacekeeper's perceptions". In *Proceedings of the 39th Annual Conference of the International Military Testing Association,* Sydney, Australia.

2 MAJ Schmidtchen, D. (1997) "What makes a successful peacekeeper: Australian's peacekeeper's perceptions". In *Proceedings of the 39th Annual Conference of the International Military Testing Association,* Sydney, Australia.

3 MAJ Schmidtchen, D. (1997) "Preparing and training peacekeepers: the need for 'soft skills'". In *Proceedings of the 39th Annual Conference of the International Military Testing Association,* Sydney, Australia.

4 Hannigan, T.P. (1990) "Traits, attitudes, and skills that are related to inter-cultural effectiveness and their implications for cross-cultural training: a review of the literature". *International Journal of Intercultural Relations, 14,* 89-111.

5 Quoted from MAJ Schmidtchen, D. (1997) "What makes a successful peacekeeper: Australian's peacekeeper's perceptions". In *Proceedings of the 39th Annual Conference of the International Military Testing Association,* Sydney, Australia.

6 Haberl-Zemlijic, A., Heje, C., Moxon-Browne, E., Ryan, S. and Truger, A. (1996) *The training and preparation of military and civilian peacekeepers.* Londonderry: INCORE, University of Ulster.

7 Slop, H. (2000) Selection procedure for peace support operations. In *Proceedings of the 42nd Annual Conference of the International Military Testing Association,* Edinburgh, United Kingdom.

8 Hansen, W., Ramsbotham, O. and Woodhouse, T. (2000) "Peacekeeping: problems, challenges, and opportunities". *Web article, http://www.berghof-center.org/handbook/woodhouse/index.htm*

9 MAJ Schmidtchen, D. (1997) "Preparing and training peacekeepers: the need for 'soft skills'". In *Proceedings of the 39th Annual Conference of the International Military Testing Association,* Sydney, Australia.

10 Quoted from LTC Lo, Y.P. (1999) "My experiences in Afghanistan as military adviser". *Pointer, Supplement issue,* 10-20.

11 Quoted from MAJ Schmidtchen, D. (1997) "What makes a successful peacekeeper: Australian's peacekeeper's perceptions". In *Proceedings of the 39th Annual Conference of the International Military Testing Association,* Sydney, Australia.

12 Cian, C. and Raphel, C. (1996) In *Proceedings of the 38th Annual Conference of the International Military Testing Association,* San Antonio, Texas.

13 CPT Hodson, S. (1997) "Organisational support for military personnel post-operational deployment". In*Proceedings of the 39th Annual Conference of the International Military Testing Association,* Sydney, Australia.

14 Ward, D. (1997) "Psychological effects of military service in Rwanda with the second Australian contingent (ASC 2)". In *Proceedings of the 39th Annual Conference of the International Military Testing Association,*Sydney, Australia.

15 Hansen, W., Ramsbotham, O. and Woodhouse, T. (2000) "Peacekeeping: problems, challenges, and opportunities". *Web article, http://www.berghof-center.org/handbook/woodhouse/index.htm*

16 Cian, C. and Raphel, C. (1996) In *Proceedings of the 38th Annual Conference of the International Military Testing Association,* San Antonio, Texas.

17 MacDonald, C., Chamberlain, K., Long, N., Pereira-Laird, J., and Mirfin, K. (1998) "Mental health, physical health and sressors reported by New Zealand Defence Force peacekeepers: a longitudinal study". *Military Medicine, 163,* 477-481.

18 Cian, C. and Raphel, C. (1996) In *Proceedings of the 38th Annual Conference of the International Military Testing Association,* San Antonio, Texas.

19 Quoted from LTC(NS) (Dr) Tan, C.C. (1999) "The Operation Nightingale experience". *Pointer, Supplement,* 27-33.

20 Bartone, P. (1998) "Stress in the military setting". In C. Cronin & S.J. College (eds) *Military Psychology: An Introduction.* U.S.A., Simon & Schuster Custom Publishing.

21 Bartone, P. (1998) "Stress in the military setting". In C. Cronin & S.J. College (eds) *Military Psychology: An Introduction.* U.S.A., Simon & Schuster Custom Publishing.

22 Litz, B.T., Orsillo, S.M., Friedman, M.D., Ehlich, P. and Batres, A. (1997) "Post-traumatic stress disorder associated with peacekeeping duty in Somalia for U.S. military personnel". *American Journal of Psychiatry, 154 (2),* 178-184.

23 COL Johnston, I. (2000) "The psychological impact of peacekeeping deployment". In *Proceedings of the 42nd Annual Conference of the International Military Testing Association,* Edinburgh, United Kingdom.

24 Dobson, M., and Marshall, R.P. (1997) "Surviving the war zone experience: preventing psychiatric casualties".*Military Medicine, 162,* 283-287.

25 CPT Hodson, S. (1997) "Organisational support for military personnel post-operational deployment". In*Proceedings of the 39th Annual Conference of the International Military Testing Association,* Sydney, Australia.

26 Quoted from COL Johnston, I. (2000) "The psychological impact of peacekeeping deployment". In*Proceedings of the 42nd Annual Conference of the International Military Testing Association,* Edinburgh, United Kingdom.

27 Quoted from MAJ Schmidtchen, D. (1997) "Preparing and training peacekeepers: the need for 'soft skills'". In*Proceedings of the 39th Annual Conference of the International Military Testing Association,* Sydney, Australia

Bibliography

Bartone, P. (1998) "Stress in the military setting". In C. Cronin & S.J. College (eds) *Military Psychology: An Introduction.* U.S.A., Simon & Schuster Custom Publishing.

Brown, B. (2000) "Australia's involvement in East Timor peace support operations   lessons learnt". In*Proceedings of the 42nd Annual Conference of the International Military Testing Association,* Edinburgh, United Kingdom.

Castro, A. C., Adler, A. B., Huffman, A.H. (1999) "Psychological screening of U.S. peacekeepers in Bosnia". In*Proceedings of the 41st Annual Conference of the International Military Testing Association,* Monterey, California.

Cian, C. and Raphel, C. (1996) In *Proceedings of the 38th Annual Conference of the International Military Testing Association*, San Antonio, Texas.

Dobson, M., and Marshall, R.P. (1997) "Surviving the war zone experience: preventing psychiatric casualties".*Military Medicine, 162,* 283-287.

Haberl-Zemlijic, A., Heje, C., Moxon-Browne, E., Ryan, S. and Truger, A. (1996) *The training and preparation of military and civilian peacekeepers.* Londonderry: INCORE, University of Ulster.

Hannigan, T.P. (1990) "Traits, attitudes, and skills that are related to inter-cultural effectiveness and their implications for cross-cultural training: a review of the literature". *International Journal of Intercultural Relations, 14,* 89-111.

Hansen, W., Ramsbotham, O. and Woodhouse, T. (2000) "Peacekeeping: problems, challenges, and opportunities".*Web article, http://www.berghof-center.org/handbook/woodhouse/index.htm*

CPT Hodson, S. (1997) "Organisational support for military personnel post-operational deployment". In*Proceedings of the 39th Annual Conference of the International Military Testing Association,* Sydney, Australia.

COL Johnston, I. (2000) "The psychological impact of peacekeeping deployment". In *Proceedings of the 42ndAnnual Conference of the International Military Testing Association,* Edinburgh, United Kingdom.

Litz, B.T., Orsillo, S.M., Friedman, M.D., Ehlich, P. and Batres, A. (1997) "Post-traumatic stress disorder associated with peacekeeping duty in Somalia for U.S. military personnel". *American Journal of Psychiatry, 154 (2),* 178-184.

LTC Lo, Y.P. (1999) "My experiences in Afghanistan as military adviser". *Pointer, Supplement issue,* 10-20.

MacDonald, C., Chamberlain, K., Long, N., Pereira-Laird, J., and Mirfin, K. (1998) "Mental health, physical health and sressors reported by New Zealand Defence Force peacekeepers: a longitudinal study". *Military Medicine, 163,* 477-481.

MAJ Schmidtchen, D. (1997) "Preparing and training peacekeepers: the need for 'soft skills'". In *Proceedings of the 39th Annual Conference of the International Military Testing Association,* Sydney, Australia.

MAJ Schmidtchen, D. (1997) "What makes a successful peacekeeper: Australian's peacekeeper's perceptions". In*Proceedings of the 39th Annual Conference of the International Military Testing Association,* Sydney, Australia

Slop, H. (2000) "Selection procedure for peace support operations". In *Proceedings of the 42nd Annual Conference of the International Military Testing Association,* Edinburgh, United Kingdom.

LTC(NS) (Dr) Tan, C.C. (1999) "The Operation Nightingale experience". *Pointer, Supplement,* 27-33.

Ward, D. (1997) "Psychological effects of military service in Rwanda with the second Australian contingent (ASC 2)". In *Proceedings of the 39th Annual Conference of the International Military Testing Association,* Sydney, Australia.

CPT Stanley Chua Hon Kiat is a Weapons System Officer (ADA) by vocation and is currently a Platoon Commander in an Air Defence Artillery Squadron. He graduated from the University of Nottingham with a BA Psychology (First Class Honours) in 2000 and a MSc Occupational Psychology (Distinction) in 2001.

Balancing Change and Continuity - Some Thoughts on the Transformation of the SAF

by MAJ Roland Ng Kian Huat

"The early Greek imagination envisaged the past and the present as in front of us we can see them. The future, invisible, is behind us."

Bernard Knox, Backing into the Future:The Classical Tradition and Its Renewal

In 1868, the US Navy produced the USS Wampanoag, a steam warship that was the fastest fighting ship in the world, originally incepted in 1863 to meet the threat of Confederate commerce raiders. Yet in September 1869, a special Naval Board on Steam Machinery condemned the Wampanoag'sdesign as "scarcely more than naval trash."[2] To quote further from the Naval Board's report:[3]

"Lounging through the watches of a steamer, or acting as firemen and coal heavers, will not produce in a seaman that combination of boldness, strength, and skill which characterized the American sailor of an elder day; and the habitual exercise of an officer, of a command, the execution of which is not under his own eye, is a poor substitute for the school of observation, promptness and command found only on the deck of a sailing vessel."

Its innovations were perhaps too threatening and disruptive to the naval culture of the times. As a result, *Wampanoag* was removed from service. It took another twenty years before the US Navy inducted into the fleet a vessel comparable to the *Wampanoag* - the USS *Philadelphia*. Ironically, the latter was about the same size and speed, even though less well-armed but more heavily armoured.[4]

What lessons can we draw from this? One important insight from this example is that planning, especially long-term strategic planning, requires predictions about the future to be made. Based on this prediction, planners then make big decisions about strategic focus, the investment of resources, and the coordination of activities within the organization. Yet it is impossible to predict in a precise and decisive way. The possibility of fundamental surprise is ever present.[5]

The strategic planners therefore face a dilemma. Small steps into the future based on extrapolation on an orderly trajectory though safe for now can be dangerously linear for the future. Yet, an organisational wide big leap or transformation involves significant risk. After all, one cannot be sure that the transformation will prove successful in a constantly evolving future. What then are the continuities and discontinuities that the SAF has to be cognisant of for a robust and flexible developmental strategy? What will be a workable organisational approach to effect transformation and changes within the SAF to resolve the inter-temporal tension between focusing on primary and immediate missions, and investing in future, quantum-leap capabilities? This article will discuss some thoughts on transformation of the SAF in the light of these issues and tensions.

The Terms "Revolution in Military Affairs" (RMA) and Transformation

Before proceeding further, some clarifications on the terms "Revolution in Military Affairs" (RMA) and "Transformation" would be timely to establish the baseline for our discussions. The term "RMA", which took its roots from the Soviet's "Military Technical Revolution"[6], became decidedly fashionable in the US defence establishments in the course of the 1990s. It was at the heart of debates within the Pentagon over future strategy and had gained prominence in Washington's byzantine budgetary and procurement struggles. "Transformation" is a more recent term, first popularized by the US 1997 National Defense Panel (NDP) report, as a description of the US Department of Defense (DoD) change. The NDP was established to report

in concert with the 1997 Quadrennial Defense Review.[7] The term has been increasingly used over the past few years to represent broad changes the US military must make in its structure and doctrine to meet the emerging challenges of the 21st century. Similarly, "Transformation" now appears in each and every paragraph of every document in the US DoD for programs that require funding.

Both terms are now widely accepted by defence establishments around the world to represent forward thinking and progressive changes. There are countless definitions for these two terms in the US and around the world, many by respected military thinkers and scholars. But beyond the general idea that they may involve revolutionary changes and incorporate new advanced technologies, no single concept has yet coalesced within the defence community. Rather than going into a debate to discern the academic nuances, the two terms are therefore used in this article interchangeably to contain certain key, immutable elements on this subject that are expressed by eminent thinkers and generally accepted:

- Transformation or RMA is not an end state in itself. It is also not just about modernization, technology insertion or a process of continual improvements to current capabilities, processes, or organizational and doctrinal constructs. It is about new operational concepts and completely different ways of doing things in terms of doctrine, training, leadership, organization, in addition to technology; it is about new capabilities that provide revolutionary or asymmetric advantages to our forces.[8]
- Transformation or RMA is not about the future. It is about the present as much as it is about the future. If something is indeed a good way to think in the future, well then why shouldn't we be thinking that way today? Or what elements of it could we not draw into the present age? When we introduce an operational prototype, or when we put something in the hands of people, they have no trouble visualizing what is happening. They can then extrapolate from that to change, join into this process from the start, and consequently, they will grow with the capability.[9]
- Transformation or RMA requires experimentation and acceptance of failures. Experimentation and prototyping are crucial for technology and conceptual evolution in the transformation process, and a complete acceptance of failure is to be taken if the payoff for success is high enough. The importance of this axiom for transformation is generally not disputed. The devil lies in the execution. In a sense, the recently conducted Millennium Challenge 02 by the US Joint Forces Command was an antithesis of how an experiment should be conducted the Red Team was held back when it was doing "too well" against the Blue Force. Larry Lynn, the retired Director of Defence Advanced Projects Research Agency (DAPRA), had recently said that perhaps the military would need to be sufficiently "scared" before doing real experimentation.[10]
- Transformation or RMA takes time. It takes time to decide how to do things, and that should give us some sense of urgency in that we cannot push these things off for very long, because it takes time to decide what it is that we want to do.[11] This should be viewed in tandem with the understanding that successful transformations usually occur incrementally. The portion of the organization that is to change is also not necessarily uniformly distributed; carefully selected elements that are engaged in transformation may carry significant ripple effects throughout the larger organization.[12] Similarly, everyone should be involved in transformation in one way or another, but not everybody should be involved to the same degree, at the same frequency, and to the same level of detail. There is a functional variance of transformation; we should not try to transform everything at once.[13] There were many examples in history: there were no Panzers in 1934, but they overran Poland in 1939; there were no U-boats in 1935, but they were the scourge of the Atlantic by 1939; there were no ballistic missile submarines in 1956, but they were an important strategic force component by 1960.[14] It takes time to develop processes and tools.

Key Trends and Drivers Shaping the Future

In moving forward, or if we follow the Greek's notion "backwarding" into the future, there are shadows that can give us a tantalizing glimpse of the shape of the future, even though the future is invisible to us. In the broadest term, we can talk of a discontinuity in the way we perceive and think about the world today, in that the fundamental assumptions people have made about the way the world operates, in political, economic and military terms, are ripe for challenge. Nonetheless, there are clearly elements of the current system that are here to stay trends below the surface that will continue, and inherent drivers that will remain invariant,

even if the emphasis placed on them will fluctuate. An examination of these trends and drivers will be useful to clarify the context and define the boundaries for the SAF's journey of transformation.

Strategic Trends

In the last decade of the 20th century, significant changes in the global and regional security environment took many by surprise. The most fundamental change is the end of the Cold War following the collapse of the Soviet Union, and the emergence of the US as the sole global superpower with both the capabilities and the will to project its power worldwide. In the immediate after-years, there was a false moment of magic and innocence during which people had the notion that we would have a new world characterised by peace, stability, progress and democracy. After all, the Cold War was won by the side that subscribed to the ideology of democracy and the capitalist market system.

However, ensuing world events demonstrated that the end of a bipolar superpower world has not brought about a new benign world order. Unlike the Cold War period, where the key geographic regions of competition were well defined, the current period is one characterized by fluidity, uncertainty and unpredictability. Regional rivalries and conflicts, previously suppressed by the division of countries into enduring and ideologically defined geopolitical blocs, have flared up around the world. In several regions, some states are increasingly unable to govern their societies, safeguard their military armaments, and prevent their territories from being served as sanctuaries to terrorists and criminal organizations. These states pose increasing threats to their neighbouring countries and the world. In a sense, the Sep 11 tragedy has served as a dramatic wake up call that ended the early innocence and at the same time announced to the world that it is going to be a dangerous and messy place. The Americans are not alone in their fear and concerns for the rise of "Unrestricted Warfare"[15] where all means are available to both states and non-state groups to perpetrate aggression. The Bali bomb attacks have effectively dissipated any residual optimism.

For the SAF, events following Sep 11, especially the revelation of the terrorist plots of the *Jemaah Islamiyah (JI)* group in Singapore and the region, could potentially be the first flash flood in an upcoming deluge of asymmetrical threats. It is not that peer competitive relationships are gone from the world stage. To this end, conventional threat to our survival remains the primary mission of the SAF. However, the rise of transnational terrorist threats such as the Al Qaeda network that uses Islam as its cause and united by the objective of creating a pan-Islamic state imply that Singapore will exist in *a new security environment* that could best be described as *"troubled peace"*, a term that seemed to have gained ascendancy.

Unfortunately, it is not just terrorists that we must contend with in this new form of warfare. The Sep 11 attacks will have demonstrated to potential adversaries that asymmetric warfare and low intensity conflict (LIC) are potent strategies when faced with conventionally superior opponents. The traditional adversaries may soon present a very different form of threat to us. The diversity of threats, many of which operate in the "seams" and fall in between traditional disciplinary or agency boundaries, also imply a strategic convergence between the fields of the military, police, and intelligence community, and even other sectors not traditionally related to security.[16] The challenge to the SAF is therefore to develop inherently flexible and versatile structures with the cognitive ability to conceive and apply the range of diverse forms under a higher level political and inter-agency institutional security arrangements.

Operational Trends

In parallel with these strategic shifts were changes in the rules of military conflicts from the Gulf War to Bosnia to Kosovo and then to Afghanistan. In 1991, the coalition forces devastated the air and ground forces of Saddam Hussein's Iraq. The opening air campaign of the Gulf War totally crippled the Iraqi abilities to effectively command, control and communicate with its forces. Yet a ground campaign was still required to bring the war to a conclusive end. It was still a Cold War era set-piece war fought between large opposing armies. Almost a decade later, in Kosovo, at the end of a 78-day aerial bombardment that had not cost the life of a single NATO soldier or airmen, Serbian strongman Slobodan Milosevic was forced to pull out his army from Kosovo. Despite controversies on the actual kills, many experts proclaimed this campaign as a

turning point in the history of warfare where airpower alone could win a war. Yet airpower was still employed in a traditional sense and the extent of revolution was not clear.

Then during the battle Mazar-I-Sharif last year, on the plains of Afghanistan, the coalition forces took existing military capabilities from the most advanced, such as state-of-art unmanned aerial vehicles, to the antique, for example the 40-year-old B-52s updated with modern electronics; from the sophisticated, such as laser-guided bombs and other precision weapons, to the rudimentary in the form of a man with a gun on a horse and used them together in unprecedented ways, with devastating effects. A soldier magically transported from the deserts of the Middle East in 1991 to the arid plains of Afghanistan would have great difficulty in understanding what he saw. This is not meant to proclaim that Special Forces mounted on horseback, carrying modern electronics and directing precision weapons delivered from 50 year-old bombers, symbolises the future of transformation. We would be deluding ourselves if we think that the next major conflict will be fought and won in the same way. Rather, the example illustrated that operational concepts will never be static and that we may be at a point of inflexion where old and new capabilities are convoluting to realise new ways of fighting that can create radically different operational effects.

Technological Trends

This brings us to the next trend. Today, rapidly advancing technological developments offer significant opportunities to the military in realizing new operational concepts and in shifting the foundations of traditional, "proven" force structures to fundamentally change the framework of war a "Revolution in Military Affairs" (RMA) or "Transformation" as commonly referred to today. It is worthwhile to note that though "RMA" and "Transformation" are modern terms, military revolution is not a modern phenomenon. The notion of periodic and radical changes in the nature and conduct of war is an old one. It is almost an insult to suggest that earlier generations have no RMAs.

Scholars and military practitioners have written about revolution in military affairs that appeared to have been fundamentally political in nature rather than fuelled by major breakthroughs in military technology. For example, the military revolution during the Napoleonic period could be argued to be driven, first and foremost, by the replacement of small, professional armies with far larger conscript armies *(levée en masse)*. The advent of some modest technological advances including better roads, more mobile artillery, and improved maps simply aided the military revolution made possible by the larger political changes that enabled war to be waged with a larger share of the resources of nation states when compared to the past.[17]

Most military revolutions, however, have arisen from new operational concepts and organizational structures, both of which are made possible by technological advances. For example, many believed that the advent of the rifle, railroad, and telegraph were the drivers for the military revolution of the mid-nineteenth century, which first became evident during the American Civil War.[18] The last hundred years has witnessed a series of revolutionary ways of fighting enabled by technological changes. The combined-arms tactics and operations, *Blitzkrieg* operations, strategic bombing, carrier warfare, submarine warfare, amphibious warfare and radar were military innovations that occurred in the interwar years from 1918 to 1939.[19] *Blitzkrie*g, probably the most commonly quoted example of RMA, was the culmination of the integration of tanks, mobile radios, and close-support aircraft through appropriate doctrines, operational concepts, and organizations.

Today, we live in no less exciting times. The changes in the C4IT have reached a tipping point that can fundamentally change how we do things tomorrow. In terms of targeting and striking, during the 1991 Gulf War, one aircraft carrier could destroy 162 targets in a day. Today, that same carrier, armed with far more precise satellite- and laser-guided bombs, can strike nearly 700 targets in the same time period.[20] In our indigenous terms, Integrated Knowledge Command and Control (IKC2) and precision strike hold promises to a new approach to warfighting that maximises combat effectiveness and that gives the SAF a quantum jump in capabilities within the constraints of our resources.

But just like the previous RMAs, technology is a double-edged sword. While technological advancements and innovations give the military the means to respond to known threats more effectively, they also create new

threats that pose challenges of an uncertain nature and scale. This is especially so today when we have moved from an age where cutting-edge technologies were developed and controlled by states before being spun off to civilian use, to an age where they are developed primarily in the private sector before being spun off to the state. The fact that the technological drivers of the current RMA are commercially and widely accessible to individuals and groups coupled with the exploitation of globalization in terms of the ease of the global movement of people and materials posed a critical vulnerability to the security of states. It has further magnified the reach and impact of perpetuators of "Unrestricted Warfare", and elevated the challenges posed by the asymmetrical threats as discussed earlier to a higher level of complexity.[21]

Internal Drivers

Just as our dominant operating environment has shifted from one of relatively predictable futures based on tangible events and calculable outcomes, to the realm of the unknown, even the chaotic, the long-term impact of a maturing economy, as well as the increasing demands placed on the SAF have put a strain on our budgetary and manpower resources. The size of our regular force and the defence budget have probably reached the limits of sustainability. But the current mode of organisation predicated on a small peacetime standing force of regulars and NSFs, with the bulk of NSmen mobilized in periods of heightened tensions and war may no longer be viable. The line between war and peace has blurred as we entered a period of prolonged "troubled peace". Increasingly, more NSmen will need to be called up to support security missions in "peacetime". But with the increasing difficulty of getting our NSmen to constantly touch base with home as a result of an increasing need in business to travel and remain overseas for extended periods, there is a limit to this linear approach. There is therefore a growing sense that the fundamental force structure and command and control structure of the SAF has to change to expand its ability to handle a wider spectrum of operations while learning to achieve a greater level of mission effectiveness with a lower level of resource inputs.[22]

Implications for the SAF Managing Risks and Creating the Capacity to Change

In summary, new challenges are constantly emerging while long-standing threats endure. The SAF must be prepared to meet future challenges while we handle extant threats. The tension between preparing for the future and meeting the demands of the present requires us to understand the risks associated with each and distribute our finite resources in a balanced manner. The issues involved are in the realm of "fuzzy problems" and cannot be simply addressed by proven methods and capabilities, as well as a linear approach based on deductive exercises in logic. This means that we need to build greater flexibility and robustness in our development approach to avoid premature decisions and unintended "lock-in" with equipment purchases, operational concepts, and related systems whose effectiveness may erode precipitously in a rapidly changing conflict environment. To this end, transformation is a vehicle for fresh approaches to risk management. By experimenting today with a variety of advanced operational concepts and military systems, strategic "options" can be created that leave the SAF with the largest number of alternative routes for the future.

But change itself is antithetical to effective control, especially in a military organization. Today, by virtue of decisions made in the past three decades, the SAF has developed into a military that is technologically focused, professionally respected, and organizationally developed. Paradoxically, the past success is also contributing significantly to the inertia to avoid radical changes for fear of interfering with current readiness and established, well-functioning procedures. Gen Eric Shineski, US Army Chief of Staff, had tried to harness the military revolution and to apply it in such measures that his reluctant organization might accept; it was too much for the old order, not enough for the revolutionaries.[23] The example captures well one aspect of the dilemma that we have to balance.

On the other hand, the success of military innovation has never been the special preserve of radical reformers at the expense of military conservatives. As Paul Harris reminds us, in military thought "the most radical are not always right and the relatively conservative not always wrong."[24] Moreover, military innovation does not occur because of the work of a few military radicals or mavericks. Organizational-wide transformation occurs only if innovators can back up their ideas with organizational power coalitions of

actors in the organization must be mobilized behind the cause of change for profound and sustainable impact.[25]

The organizational challenge for the SAF, then, is to develop robust structures and mechanisms through which we can nurture a hotbed of truly innovative ideas alongside our regular, well-functioning system. We should allow a population of diverse initiatives, some of which may be radical and different from the mainstream, to be developed and sustained for a meaningful period of time before decisions for large resource allocations are made. This will be especially valuable when the direction to go is not clear. There must be space for change and continuity, as both are equally important to the success of the organization.

A Framework to Balance Change and Continuity

Larry Lynn, in his recent interaction with the SAF, had said that from his personal experience, creativity and innovation in military operations almost always emerged at points of crisis. If the amount of innovation in the US military was assigned an arbitrary value of x, then in the five months leading to Desert Storm, Larry Lynn believed that the US military had done above $10x$ in terms of innovation.[26] We probably do not want a real war to force transformation. But does that mean that the military has no way to effect strategic innovation and assimilate radical but necessary changes in peacetime?

The military is not unique in facing this dilemma of change and continuity while operating in an environment marked by uncertainties and surprises. Nature may provide some insights when we examine the developmental strategies that all species has adopted in order to thrive in a harsh environment.

A Thought Experiment Drawing Parallels from Nature

Nature is also frugal with resources. Eric D. Beinhocker has made the following observations in his article "Robust adaptive strategies" in a Sloan Management Review journal.[27] He noted that in the biological world, all species respond to a constantly changing environment and relentless selection pressure through mutation and sexual recombination. The genetic deck is constantly reshuffled in search of higher fitness. The point mutations of DNA are nature's mechanism for evolutionary changes small steps in response to immediate, unfavourable changes in external circumstances. On the other hand, sexual reproduction, which shuffles the genetic deck more radically, is nature's mechanism for revolutionary changes a medium or big jump to adapt to completely new environments.

Beinhocker further explained that each member of a species is therefore a different experiment. In the population of a species, we will find some closer and some farther from the average locus of the group. While on the whole there is significant variation, it is not wild random diversity. Even species that are relatively stable over time are constantly testing the value of that stable strategy with individual experiments. This is because the survival of the species is more likely if it has such diverse portfolio of genetic experiments. As the environment changes and reduces the fitness of typical members, the odds of survival for the species are increased with the existence of atypical members, some of whom may have qualities that are useful in the new environment.[28]

Is there a framework that can allow the military, and enterprises in general, to better understand and apply the developmental strategies that species in nature has adopted for survival? A deeper insight could probably be gained by examining a thought experiment that biologists perform to understand patterns of evolution in nature, brilliantly articled by D.C. Dennett in "Darwin's Dangerous Idea"[29] and adapted by Beinhocker for insightful lessons in business strategies. Let's walk through this experiment:[30]

Imagine a very large grid. In the case of biologists, the points on the grid represent possible gene combinations. For strategists, each point on the grid represents a possible developmental initiative that we can pursue. Further, imagine the grid to be three-dimensional. The outcome or fitness of each possible initiative on the grid can then be represented by its height.

In most complex systems, whether biological or human affairs, the landscapes have many peaks and valleys. In general, however, the heights of different points on the landscapes are correlated in such a way that high peaks tend to be near other high peaks, and deep valleys near other deep valleys. To understand this, picture a complex landscape of the Rocky Mountain highlands and the Death Valley lowlands. This in turn means that developmental initiatives similar in nature tend to yield similar outcome or fitness.

The endeavour of an organization in pursuit of excellence is analogous to the search for the highest peak in such a landscape. In this experiment, we will face several challenges. Firstly, we can only carry a limited amount of food during the search. More food can only be found on the higher peaks. Therefore, if we get stuck in a deep valley for too long, we might die of starvation. Secondly, we can rely only on sight, as we have no map of the region. Thirdly, we can only see a few feet ahead beyond which everything becomes very foggy. And lastly, to add to our challenge, the height of any particular point on the landscape is constantly bucking and heaving over time, with periodic earthquakes. As the strategies of competitors change, the fitness attributable to any given potential initiative will also change. What is successful today may not be successful tomorrow. How would we survive in such an unfriendly landscape? What would be our best strategy for searching the high peaks?

The first thing we need to do is to keep moving. Stasis is death. New peaks and hence food can never be found if we are not constantly exploring. Staying at a high peak with plenty of food for too long, even if we are fortunate enough to find one, is also not desirable. At some point, that peak will collapse as the environment changes or competitors' actions deform the landscape.

How then do we decide where we should go? The first thing to do is to look for a path leading upward in the landscape and take incremental steps. Such a process of incremental upward steps in the landscape is termed by biologists and mathematicians as an adaptive walk. It is a very efficient method as there is a causal relationship between effort and reward every step forward is usually a step upward. Adaptive walk is also less risky in general, especially if the peaks are correlated, that is, high peaks are near other high peaks. However, we must never discount the odds that we may arrive on a local maximum that is the highest point in its immediate vicinity but not the highest in a larger region. We will be stuck because every direction will lead downward. Worst still, just across a narrow valley but not visible through the fog may lie a much higher peak.

This calls for scouts and expeditionary teams to be sent out in multiple directions to explore new terrain and identify higher peaks. The more places we are simultaneously exploring, the more likely we are to find a new higher peak or to know where good spots are when our peak begins to collapse. Assuming that we have very advanced, powerful boots that allow us to spring to points far away in the landscape, we can then make a jump to get away from the local maximum when the scouts and expeditionary teams discover the next higher peak. One caveat: we should make the jumps when we know where we are going to land. Not looking before we jump is a leap of faith, a blind one most of the time.

The best strategy for searching the high peaks then is really a mixture of adaptive walks with occasional medium and long jumps. The adaptive walks ensure that most of the time we are heading toward a higher level, while the jumps keep us from getting stuck on local peaks and allow us to scale new heights.

Insights for the military from this thought experiment: when managing a population of initiatives, it is essential that the population contains a balanced mixture of initiatives ranging from short-term incremental extensions of the current core competencies to transformational initiatives that have longer time frames and highly developmental in nature to create new competencies. At the same time, it is not a single solution set in each temporal frame but multi-solutions set for robustness. This is where transformational elements in our developmental approach contribute towards developing a flexible and robust SAF. Having transformational elements not only increases the odds of creating quantum leaps in capabilities; by providing some diversity to current strategies, it also provides hedging when the landscape unexpectedly changes. From this perspective, transformational elements in our developmental approach are a necessity rather than an abnormality to develop a flexible and robust SAF.

Resolving the Inter-Temporal Tension

While the framework discussed in the last section may sound appealing in theory, some practical issues and questions come to mind. More specifically, how do we resolve the inter-temporal tension that results from having only finite resources or, in the thought experiment, finite number of hikers, to fulfill both current and immediate mission and invest in the unknown?

We can't afford to do everything. Won't we spread ourselves too thin? A common and intuitive concern to this developmental approach is "we cannot bet on everything." But an equally valid truism is "we should not put all our eggs in one strategy basket." The best course is likely to lie somewhere in between the two ends of the spectrum. However, for the military service, its nature dictates that some general principles be adhered to.

In war, there is no second place. We must stay focused on our primary missions. Most resources are likely to be committed to adaptive walk initiatives for readiness and extension of existing capabilities, and medium jumps initiatives to build existing capabilities to create new capabilities. We must remain capable and effective in prevailing against our current and immediate threats and demands. Else, there will be no future for us to invest.

How much then should we put into long-jump initiatives to seed for future growth, and hedge against key uncertainties? Some insights could be gained by examining successful examples of Revolution in Military Affairs during War World II — the German *Blitzkrieg*, and the American and Japanese carrier warfare. The interesting thing about both cases is that only a very small part of the force was equipped with the new platforms during the war. The Germans were going into France with 10 Panzer divisions out of an Army of 190 divisions. For the US Navy, of the 650 ships that went into war, only eight of them were aircraft carriers.[31] However, the whole force realigned themselves around these new weapons with new concepts and organization that revolutionalised the nature of warfare. While the US Navy example may be extreme and specific in context, the German example suggested that changing five to ten percent of the force from old to new over a period of time might be a good guide.

Effecting Changes from Within or Without?

Failed mental models that incorrectly shape the way we see the world and cultural lock-in are two leading culprits that hinder our ability to transform.[32] These two factors are largely responsible for the fog in our thought experiment. They often lead to denial and over-confidence that create organisational myopia, which simply takes self-perceived "impossibilities" away from our radarscope. But is the generalization by Captain Alfred Thayer Mahan that no military service should or can undertake to reform itself, and that change must be directed from outside the military institution valid?[33]

Philip Evans of *"Blown to Bits"* fame has postulated that there are two broad approaches to organisational change, which are modelled after the evolutionary theories of Darwin and Lamarck.[34] Underlying the whole Lamarckian Theory was a principle of "tendency to progression" it was an innate quality of nature that organisms constantly "improve" by successive generation, too slowly to be perceived but observable in the fossil record. When applied to organizations, the theory argues that organizations can change themselves from within in response to external circumstances or self-imposed just like nature is in a constant state of advancement.

Conversely, the Darwinian Theory, which argues that the environment "selects" the best fitting individuals, when applied to organizations, entails the need to foster and nurture innovation outside the established hierarchy. The theory argues that within the current organisation, disruptive innovation cannot happen or survive. There is a need to cultivate such innovation in an independent context: isolating the new from the old, nurturing the new independent of the "corrupting" influence of the old, growing it to a point where it will become robust and re-injecting back into the mother organisation the innovations that have been engendered. Such a change process is essential when dealing with disruptive technologies.

In between the extremes of the two approaches, there are many variations in which enterprises have adopted with various degrees of success. This leads one to surmise that there may actually be no single best model for introducing change. Whether to set up an innovative entity outside the corporate structure or attempt to build one from within really depends on the corporate culture and situation, and every situation is different. Structural and process "fit" may be a case-by-case decision. However, it is important to note that for military transformation to be successful, at critical point, it must be organized internally and from the apex of great institutions   change is only successful if the military accepts it in a corporate manner. Therefore, if a splinter unit is established to drive transformation, it is important to maintain contact between the old and new organizations to cross-fertilise and re-integrate the ideas generated by the splinter unit back into the mainstream.

Conclusion

Deputy Prime Minister and Minister of Defence, Dr. Tony Tan, in his opening address for the Inaugural Island Forum 2002 said, "Transformation is necessary for the simple reason that the world has changed, and continues to change. Transformation means changing ourselves and our institutions before change is forced upon us." It is therefore not a matter of choice that the SAF must transform. The pertinent questions, among others, are the "hows"   how to transform, how much to transform, and how fast to transform essentially the issues of balancing change and continuity in a great institution. This article is intended to provoke some questions and comments, and hopefully, some answers as well.

Bibliography and Notes

1 Many ideas in the essay are reflections from views heard from eminent foreign visitors, ideas shaped by visionary senior leaders during course of work, and exchanges with peers on the subject in the past year. The insights from the work on the monograph *Capacity to Change* (*POINTER* Monograph No. 1) played a strong influence. Any error or mis-representation are however the author's.

2 Lance C. Nuhl, "Mariners and Machines: Resistance to Technological Changes in the American Navy, 1865 1869", pg. 703, *Journal of American History* 61, no. 3, Dec 1974.

3 U.S. Document 1411, 41st Congress, 2d Session, 1869-70, Vol. One, Part One.

4 Gen (Ret) Paul Gorman, Consultant, Institute of Strategic Studies made these observations in a presentation at Session 4 of Island Forum 2002.

5 These were pertinent concerns and have been expressed by senior officers during interactions with SCSC 02 students.

6 Williamson Murray and MacGregpr Knox, *The Dynamics of Military Revolution 1300 2050*, pg. 4, Cambridge University Press, Aug 2001.

7 Colin Robinson, "Defining Transformation?", Centre for Defence Information Military Reform Project, 25 June, 2002.

8 Andrew Krepinevich, *Transforming The American Military*, pg. 10, Backgrounder, Published Nov 1997.

9 Special Defense Department Briefing with Director of Force Transformation Arthur Cebrowski on "Force Transformation" at Pentagon Briefing Room, 27 Nov 2001.

10 Larry Lynn made this comment at a presentation titled "Transformation in the US Military" during his visit from 25 to 30 Nov 02.

11 VADM (Ret) Arthur Cebrowski, "What is Transformation", pg. 3, Publication of Office of Force Transformation, 1995.

12 Island Forum 2002 Executive Report, "Transformation Experiences in the Military and Industry", Sep 12 14, 2002.

13 VADM Dennis McGinn, Deputy Chief of Naval Operations for Warfare, US Navy made these comments in a presentation at Session 6 of Island Forum 2002.

14 Highlands Forum XVII Executive Summary, "Transformation and the Department of Defense", Jun 25-26, 2001.

15 Qiao Liang and Wang Xiangsui, "Unrestricted Warfare", pg. 179 203, Translation by FBIS.

16 Island Forum 2002 Executive Report, "Transformation Experiences in the Military and Industry", Sep 12 14, 2002.

17 Barry D.Watts, "What is the "Revolution in Military Affairs?", pg. 5, Northrop Grumman Analysis Centre, 6 April 1995.

18 *Ibid*, pg. 5.

19 *Capacity to Change*, pg. 3, *POINTER* Monograph No. 1

20 Greg Jaffe, "War Plan Aims to Balance Roles of Ground Forces, New Weapons in an Iraq invasion, New Theory on Waging Battle would be Tested", *The Wall Street Journal*, 27 November, 2002.

21 *Capacity to Change*, pg. 5, *POINTER* Monograph No. 1

22 *Ibid*, pg. 9.

23 Peter J. Boyer, "A Different War Is the Army Becoming Irrelevant", pg. 66, New Yorker, 1 July 02.

24 Paul Harris, "Radicalism in Military Thought", pg. 43 The Occasional no. 36, The Strategic and Combat Studies Institute, Sep 1998.

25 Michael Evans, "Fabrizio's Choice: Organizational Change and the Revolution in Military Affairs Debate", pg. 6,*National Security Studies Quarterly*, Volume VII, Issue 1 (Winter 2001).

26 Larry Lynn made this comment at a presentation titled "Transformation in the US Military" during his recent visit from 25 to 30 Nov 02.

27 Eric D. Beinhocker, "Robust Adaptive Strategies", *Sloan Management Review*, Special Issue: In Search of Strategy, Spring, 1999.

28 *Ibid*.

29 D.C. Dennett, *Darwin's Dangerous Idea*, pp. 107 113, New York: Touchstone, 1995.

30 Eric D. Beinhocker, "Robust Adaptive Strategies", *Sloan Management Review*, Special Issue: In Search of Strategy, Spring, 1999.

31 Bill Keller, "The Fighting Next Time", *The New York Times*, 2002.

32 Richard Foster, "Creative Destruction: Emergence, Performance and Extinction In American Business", Presentation at Session 3 of Island Forum 2002.

33 Elting Morrison, *Men, Machines and Modern Times*, pg. 38, The MIT Press, 1966.

34 Philip Evans made this comment at a presentation during Session 3 of Island Forum 2002.

MAJ Roland Ng Kian Huat is a Weapons System Officer (ADA) by training and is currently an Assistant Director at MINDEF. Previously he held the appointments of Branch Head at MINDEF and HQ ADSD as well as Squadron PC. He graduated with a Masters of Engineering from University College London.

Ingredients of Change: A Recipe for Transformation

by MAJ Lim Tuang Liang

Throughout history, militaries have continually sought to pursue technological advances in the hope of making a discovery that can be translated into transformational capabilities, giving them the convincing edge over their adversaries in the next conflict. It is this spirit of innovation and transformation that has seen the nature of armed conflict evolve so rapidly that militaries which continue to use operational doctrines of the previous war were usually the ones who lose the next war.[1] Armed conflict is not only a test of wills, but also a test of one's ability to develop superior operational concepts based on breakthrough technologies.

With the end of the Cold War, militaries have recognised the need to transform their forces, adapting to the different demands of the new world order. The urgency to transform has been exacerbated with the emergence of transnational terrorist threats after September 11. The SAF, faced with a gamut of unique challenges, has also just begun in its transformation journey, seeking to develop new operating concepts to meet the security challenges in the 21st century. This essay looks towards history to reveal the important characteristics of military transformation and proposes several key mechanisms of change that will be essential to an organisation that seeks to challenge old assumptions and develop transformational modes of operation that challenge the incumbent mode of warfighting.

Characteristics of RMA / Military Transformation

Revolutions in Military Affairs are not phenomena found only in modern warfare. Since the beginning of armed conflict, technological advances of science, coupled with the desire for military dominance, have spurred many creative military geniuses to seek disruptive ways to harness the power of technological development. Close examination of historic military records has revealed several key characteristics of RMA which are noteworthy.[2]

- *RMAs are rarely brought about by dominant players*. During the period between the First and Second World Wars, the dominant European players in land warfare, namely the French and the British infantry and artillery forces, did not develop the Blitzkrieg concept of tank warfare.[3] Similarly, the British navy, then a dominant player in sea warfare, did not fully develop the concept of carrier warfare.[4] Rather it was the Germans who adopted Blitzkrieg concepts with great success while the Americans and Japanese brought out the dominance of carrier warfare.
- *RMAs do not have to be technologically-driven*. A classic example can be seen in the transformation of combat tactics used by the Americans during the Revolutionary War (i.e. engaging an opponent from behind cover rather than in formation in the open), which brought about a revolutionary change in land combat without any change in the weapon technologies involved.
- *All successful technology-driven RMAs appear to have three components: technology, doctrine and organisation*. Technology in itself, even when developed into a revolutionary weapon, cannot bring about an RMA. Although it was the British who first developed the tank, the technology did not make significant contributions to their land warfare capability. The Germans, however, were quick to combine the tank, the two-way radio and dive bomber technologies into an operational concept where mobile armoured forces were used to break through the enemy defences to penetrate to the rear.[5]
- *RMAs often take a long time to produce desired results.* While almost all of the technological advancements embodied in the machine gun were completed by the 1870s, it did not bring about the RMA in European warfare fully until September 1914, some 40 years later.[6]Records have shown that the German army had begun experimenting with tanks as early as the 1920s, before they introduced the Blitzkrieg with dramatic effect two decades later.

Analysis of the characteristics of historical RMAs has revealed several important lessons for the SAF as it embarks on the path of transformation. Firstly, there exists greater motivation for less dominant players in the region to bring about an RMA. The SAF must therefore be alert to RMAs carried out by others even as it seeks to achieve the RMA ahead of potential adversaries. Secondly, transformation endeavours should not be limited to technology-centric exploration. Rather, equal emphasis must be placed on the development of new operational concepts and doctrines, as well as soldiers who are able to operate and innovate despite the friction of war. As Clausewitz observed, "Military activity is never directed against material forces alone; it is always aimed simultaneously at the moral forces which give it life, and the two cannot be separated." Lastly, the long gestation period of RMAs requires the commitment and stamina of the organisation to see through the oft painful process of transformation.

Having spelt out some key considerations in the transformation of our military capability, we can now proceed to examine the ingredients necessary to bring about a successful RMA, drawing from military and business examples to highlight several key elements that must be present to bring about the transformation of the SAF.

Ingredients of Change

Vision: Guiding the Transformation

The power of a clear and coherent vision in the transformation of an organisation can be best seen in Komatsu's vision of "Maru-C", a dream of "encircling" Caterpillar by attacking in product and market segments where Caterpillar was under represented, with the goal of being the dominant challenger worldwide to Cat in the earth-moving equipment industry.[7] From a $170m company which specialised in the Japanese market in 1963, Komatsu grew to become a $2.8b challenger of the industry leader, Caterpillar, gaining as much as 25% of the world market by 1985, just as Caterpillar conceded 20% of market share. This was because the sharing of the "Maru-C" vision provided the motivation, inspiration, focus and purpose for every employee in Komatsu to effect the transformation necessary in his own department to achieve the stated goal.

The development of an operational vision for the SAF would serve as a guide to the current transformational efforts undertaken throughout the organisation. A tangible vision allows different segments of the SAF to begin thinking about the local transformations within their operational scope that are necessary to support the grand vision. Furthermore, an operational vision anchors an idea that can be subjected to more vigorous debate, with a possibility of developing an alternative concept worthy of further exploration.

Without a sensible vision, a transformation effort can easily dissolve into a list of confusing and incompatible projects that will make the transformation journey a slow and meandering one. It prevents the formulation of a strategic architecture that will help focus near and medium term developmental efforts that will contribute to attainment of the final goal.[8] Numerous proponents of UAVs have highlighted the transformational potential of the unmanned craft in modern warfare. Yet after two decades of UAV development, the Pentagon has fewer than 100 UAVs in use to show for its US$6 billion investment. Critics have pointed out that the slow progress has been largely due to a lack of clear direction, resulting in the involvement of multiple parties with different requirements and little money.[9]

Leadership: Breaking the Resistance

Central to any organisational transformation is the existence of a group of leaders who firmly believe in the benefits of the transformation. Senior officers with traditional credentials will be needed to sponsor new ways of doing things.[10] However, there must also exist a critical mass of such sponsors in order to transform a large organisation such as the SAF. Business examples have shown that successful transformations include not only the chairman or president or division manager, but also five or 15 or 50 people who come together and develop a shared commitment to performance excellence through a process of organisational renewal.[11] The same can be said of military transformations, as can be seen from General von Seeckt and his cadre of visionary officers during the initial stages of development of the blitzkrieg RMA.[12] A military

transformation leading to an RMA is likely to challenge the status quo, calling for often painful reallocation of resources and organisational restructure. It is therefore through such a cadre of influential officers that the arduous and prolonged process of transformation can be sustained when faced with the uphill task of going against the established norms.

Such a coalition of transformational leadership need not include only members from senior management. Often behind successful transformations lies a guiding coalition that operates outside the normal hierarchy. The strength of a diverse guiding coalition is that it is well positioned to communicate the vision to the rank and file of an organisation at the brink of transformation.[13]Cor van der Klugt, the CEO of Philips in the 80s, redefined management responsibilities within the company to give product divisions greater freedom to respond to competitive and market pressures. Yet his efforts were not sufficient to pull Philips out of the crisis during his tenure when faced with stiff competition from Sony and Panasonic. What was lacking was widespread employee support as there was little alignment between senior managers' statements and the practice and attitudes of lower-level managers and their subordinates.[14]

The SAF should therefore involve a larger group of officers from diversified backgrounds to help explore possible transformational paths to be undertaken. Such a community of officers would possess intimate knowledge of the issues and considerations surfaced in the development of the transformational goals, and they would in turn act as agents of change, breaking down barriers to change in their respective spheres of influence and winning over the hearts and minds of the rank and file.

Experimentation: Exploring the Unknown

Admiral William S. Sims began a series of strategic and tactical exercises at Naval War College in 1919 to explore the use of aircraft in naval operations. These continued throughout 1920s and 1930s, in parallel with the Bureau of Aeronautics' development of naval aviation technology and experiments with system, basing concepts, and operational concepts. The efforts culminated in the carrier warfare doctrine of 1941-1942. This example highlights the importance of experimentation when treading the unbeaten path of transformation. Indeed, analysis of military innovation between World War I and II has shown that institutional processes for exploring, testing and refining conceptions of future war are literally the *sine qua non* of successful military innovation in peacetime.[15]

Experimentation provides the opportunity to make incremental discoveries on the impact that new capabilities may have on existing core competencies in the military. For example, the impact of introducing IT in modern warfare was best shown in Fleet Battle Experiment (FBE) Delta, conducted by the US Navy in conjunction with Combined Forces Command Korea. The experiment introduced a land-sea engagement network to counter hundreds of North Korean special operations boats. The results of the experiment showed a decrease in the number of leakers by a factor of 10.[16] Through the process of experimental design, execution and analysis, transformation proponents would be able to develop and demonstrate operating concepts with the potential to transform the military, and not just showcase a particular technology in an operational vacuum. The positive results from such experiments will serve to encourage commanders to embrace the change, accelerating the pace of transformation. Coupled with experimentation must be the tolerance for "honest failure" in a period of great change and uncertainty. For example, in this century the US Army has developed several radical new force structure organizations, including the airborne and air assault divisions. Yet the Army also had its failuresthe pentomic and tricap divisions. If no mistakes are tolerated on the road to transformation, strong incentives would exist to deviate as little as possible from what is "proven" to be effective in today's military. A culture for transformational change that encourages debate and allows mistakes is therefore essential for the SAF to embark on the experimentation for transformation.[17] If not, the desire for operational efficiency may well crowd out the hoped-for transformation.

Simulation: Converting the Sceptics

Military innovation that leads to paradigm shifts in warfare typically occurs in spurts, often accelerated when nations are at the brink of war.[18] Militaries scramble to employ capabilities that have been in gestation for

long periods prior to the period of conflict, often developing transformational concepts only after the capability has been fielded in battle. This is because the military utility of an RMA is frequently controversial and in doubt up until the moment it is proven in battle. The combat value of the machine gun was lost on the British until they used it with devastating force against the Zulus at Ulundi in 1879. The power of carrier aviation was doubted all the way till the Battle of Midway in 1942.[19]

Short of actually provoking a war, how then can militaries stir themselves sufficiently to accept the disruptive capabilities[20] that will spark off an RMA? To solve this problem, the Americans and the Swedes have turned to large-scale field exercises. These enable the military to come close as they can get to the experience of war. In the past, field exercises have proven critical to the success of military transformation. The US Navy could not have developed the principals of carrier battle group operations without the series of Fleet Problems undertaken during the 1920s and 30s.[21]

Unfortunately, the SAF would not be able to mount any large scale exercises for the purpose of transformation due to a lack of training space and the huge amount of resources that have to be committed to such a pursuit. How then can commanders be persuaded to abandon time-proven warfighting concepts and force structures, to relinquish traditional sources of power to reshape the military, at the risk of degrading operational readiness? One possible avenue lies in the field of virtual simulation. High fidelity virtual simulation systems that are designed to model yet unfielded technology will provide operators and commanders an immersive glimpse of the future. The effects of untried, yet transformational operational concepts that incorporate new technological capabilities could be easily verified through a highly integrated network of simulators, without the cumbersome staging of actual forces in live scenarios with limited realism. Simulations of lower fidelity and higher aggregation would not enable commanders and operators to "experience" the change, making the task of winning over the masses an uphill one.[22] Therefore it would be worthwhile for the SAF to acquire or develop hi-resolution virtual simulation technology for experimentation. Without the tools to help the SAF glimpse into the future, transformational attempts would very likely be a calculated leap of faith.

Failed Transformations

Having discussed some of the core ingredients that should be included in the transformation of the SAF, it would be useful to examine historical examples of failed or incomplete RMAs. Three key phenomena that have caused RMAs to falter are presented to highlight the possible stumbling blocks that should be taken into consideration in any military transformation.[23]

- ### Lack of Operational Concepts

  Even the most powerful weapon system, if not coupled with a revolutionary operational concept, will never bring about an RMA. The machine gun or rather the lack of a position for the machine gun is a prime example. Towards the end of the 19th century, the development of a machine gun was fairly complete, yet most European armies had no idea what to do with the weapon. In the battles of Wissembourg and Spichern in 1870 during the Franco-Prussian War, the French mounted machine guns on artillery carriages and sited them with field artillery as indirect fire weapons.[24] Naturally, the machine guns were blown to bits by Prussian artillery before a single bullet could be fired.

- ### Incorrect or Incomplete Operational Concepts

  There are times when certain elements missing in an operational concept can cause one player to miss the full potential of an RMA that is achieved by another. Towards the end of WWI, the Royal Navy had over three years of wartime experience operating almost a dozen carriers of various types,[25] before any other naval powers had even one. Yet the British missed the carrier RMA because their concept of operations did not include the "deck park", which allowed a major component of the carrier's aircraft to be stowed, rearmed and refuelled on the flight deck. The result was British carriers that carried 24-30 aircraft, whereas American and Japanese carriers

carried 80-100 aircraft.[26] As such, the American and Japanese carriers could launch larger single attacks and faster successive attacks which made a world of difference.

- **Rejection of Operational Concept by Established Military Culture**

    There have been occasions when an effective operational concept was unacceptable to the prevailing military culture, which prevented the active development of doctrine and force structure to exploit the operational concept. Analysis of the use of the machine gun by the British during the period leading up to WWI highlights this point. Unlike the continental European armies, the British had learnt how to use the machine gun with devastating effect by the end of the 19th century. The machine gun was employed extensively in Africa fighting the native tribes.[27] However, the machine gun was conceived by the "officers and gentlemen" as an uncivilised weapon against other officers and gentlemen, hence reserved for use by colonial forces on native tribes, and initially limiting its employment in WWI.

Conclusion

This essay has examined the several fundamental characteristics of RMA throughout history. The observation that RMAs are usually not brought about by dominant players should create an urgency for the SAF, regarded by many as the dominant armed forces in the region, to take its transformation efforts seriously to maintain a capability edge, lest a more motivated and less dominant player bring about an unanticipated RMA in our region. In an attempt to transform the military, the SAF should not fall into the technology trap, neglecting the elements of doctrine and organisation which have proved to be equally essential in successful RMAs. Most importantly, the SAF must remain committed to transformation, and be able to institutionise innovation throughout the ranks to see through a period of 15-20 years before an RMA can be achieved.

Four important ingredients of change have also been presented that are important in the transformation process. The contributions of vision, leadership, experimentation and simulation must be present at every stage of change so as to move any large organisation which is determined to remake itself. These ingredients provide the mechanisms to move every single soldier in the SAF onto the path of transformation.

Finally, an analysis of failed or incomplete RMAs has shown that the development and acceptance of potentially revolutionary operational concepts are vital to the success of military transformation. Greater effort must be put into the concerted development of concepts that will exploit the strategic strengths of the SAF. The upcoming Future Systems Directorate has been given the mandate to explore many of such revolutionary concepts to spearhead the SAF's transformation. Services must be willing to participate actively in the development and exploration of concepts that draw on the complementary capabilities of each service as we move forward to the next stage of Integrated Warfare. Only with an open mind, a maturity to rise above service-centric turf guarding, and a firm commitment to transformation can a new page of the SAF's history be written.

Endnotes

1 The French could not see how the tank could overcome the power of defence so well demonstrated in 1914-1918. See Doughty (1985)

2 See Hundley (1999) pp. 11-17

3 See Macksey (1975) on exploitation of tank technology in the blitzkrieg concept.

4 The British conducted the first carrier air raid in history on Christmas Day 1914 the attack on Cuxhaven Zeppelin base by seven British seaplanes from three impoverished carriers in the Heligoland Blight.

5 During the 1920s-30s, the US Army viewed tanks as infantry support weapons, which led them to develop tanks with low-velocity guns that were significantly inferior to the German tanks they faced in WWII. (See Johnson, 1990)

6 See Ellis (1975)

7 See Hamel & Prahalad 1989, "Strategic Intent", *Harvard Business Review*, May-Jun 1994

8 See discussion on strategic architecture by Hamel & Prahalad (1994)

9 See "The Search For An Affordable UAV", *DefenseNews* (Sep 2002)

10 See Rosen (1991) pp. 76-105

11 See Kotter, J.P, 1995, "Leading Change: Why Transformation Efforts Fail", *Harvard Business Review*, Mar-Apr 1995

12 See Corum (1992)

13 See Hamel and Prahalad (1994)

14 See article on "Why Do employees Resist Change", *Harvard Business Review*, May-June 1996

15 Murray and Watts (1995) pp. 88

16 See discussion on NCW by Alberts, Gastka, Hayes and Signori (2001) pp. 272-274

17 See discussion on transformational change. MAJ Seet Pi Shen (2001)

18 Team Sigma discussion with Larry Lynn on Military Transformation, 2002

19 See Turnbull and Lord (1949)

20 See discussion on sustaining and disruptive capabilities by Christensen (2000)

21 Extract of Testimony of Andrew Krepinevich, Executive Director, before the Senate Armed Services Subcommittee on Emerging Threats and Capabilities, 1999.

22 Team Sigma discussion with John Gastka on Network Centric Warfare, 2002

23 See Hundley (1999) pp. 26-30

24 See Ellis (1975) pp 63- 64

25 These included Ark Royal, the first ship designed and built as a carrier, and Argus, the first flat deck carrier. See Friedman (1988) and Murray and Watts (1995)

26 British carriers were also somewhat smaller than the American and Japanese counterparts but the key factor was the lack of deck parks.

27 In the Battle of Omdurman, 11,000 Dervish were brought down primarily by six Maxim guns, with only 48 losses on the British side

Bibliography

Christensen, C. 2000, *The Innovator's Dilemma*, Harper Business School Press, Boston, Massachusetts

Corum, J.S. 1992, *The Roots of Blitzkrieg: Hans von Seeckt and German Military Reform*, University Press of Kansas, Lawrence, Kansas

Doughty, R.A. 1985, *The Seeds of Disaster: The Development of French Army Doctrine, 1919-1939*, Archon Books, Hamden, Connecticut

Ellis, J. 1975, *The Social History of the Machine Gun*, The John Hopkins University Press, Baltimore, Maryland

Friedman, N. 1988, *British Carrier Aviation: The Evolution of the Ships and Their Aircraft*, Annapolis, Maryland

Hamel, G & Prahalad, C. K. 1994, *Competing for the Future*, Harvard Business School Press

Hundley, R.O. 1999, *Past Revolutions, Future Transformations: What Can the History of Revolutions in Military Affairs Tell Us About Transforming the U.S. Military?*, RAND Publications, Santa Monica, California

Johnson, D.E. 1990, *Fast Tanks and Heavy Bombers: The United States Army and Development of Armor and Aviation Doctrines and Technologies, 1917-1945*, PhD Thesis, Duke University, Durham, North Carolina

Macksey, K. 1975, *Guderian, Creator of the Blitzkrieg*, Stein and Day, New York

Murray, W. & Watts, B. 1995, *Military Innovation in Peacetime*, report prepared for OSD Net Assessment

Rosen, S.P. 1991, *Winning the Next War: Innovation and the Modern Military*, Cornell University Press, Ithaca, New York

Seet, P.S. 2002, *A Culture For Transformational Change Strategies For The SAF*, Pointer, Jul-Sep

Turnbull, A.D & Lord, C.L. 1949, *History of United States Naval Aviation*, Yale University Press, New Haven, Connecticut

MAJ Lim Tuang Liang is a pilot by vocation and is currently attending the Air Command and Staff College, Montgomery, Alabama, US. He was previously a Branch Head at the Air Plans Department. MAJ Lim graduated with a Masters in Engineering (First Class Honours) from Imperial College of Science, Technology and Medicine in 1995.

Manoeuvre Warfare: Lessons from the Boardroom for the Battlefield

by MAJ (NS) Seet Pi Shen

"All the business of war, and indeed all the business of life, is to find out what you don't know from what you do."

Arthur   Wellesley,
1st Duke of Wellington[1]

Whether in peace or war, uncertainty is a part of life and the Duke of Wellington's comment is as relevant today as during the Napoleonic era. Today, with rapid technological and social developments, military forces must not only 'live' but also 'thrive' in a state of rapid, continuous change, bordering on chaos. It is widely believed that the world is undergoing a 'revolutionary' period of change as it transits from the 'Industrial Age', with the focus on machines, to the 'Information Age', with the focus on knowledge.[2] Like the transition from the Agrarian Age to the 'Industrial Age', this will have a significant effect on the future of military organisations.

In this context, the Singapore Armed Forces (SAF) needs to learn to thrive in this new paradigm of highly complex uncertainty. Manoeuvre warfare has been identified by many modern armed forces to be very appropriate in dealing with the chaotic nature of future warfare. However, like most armed forces, the SAF does not often get to practice manoeuvre warfare in peacetime and only gets to train its people hard on it. Instead of being insular and resting on its laurels, it should look to other disciplines and organisation that may be using manoeuvre warfare concepts to learn the 'best practices' in managing and overcoming the problems of complex uncertainty.

It is the argument of this essay that the SAF can learn much from commercial practitioners of manoeuvre warfare. Business firms constantly engage in commercial warfighting operations daily and many successful companies practice manoeuvre warfare, either consciously or unconsciously, to winning effect to stay ahead of the competition.

The essay will briefly highlight the core approaches of manoeuvre warfare and show why manoeuvre warfare is highly appropriate to modern, non-linear warfare. It will then explore why the SAF needs to learn from other non-military practitioners of manoeuvre warfare, especially in the business world, and examine how some successful companies have effectively implemented some of these concepts. It will conclude that by synthesising the lessons of the business world with the realities of the modern battlefield, the SAF will be able to fight above its weight by targeting potential adversaries' centres of gravity and dislocate them by shattering their will to fight.

Manoeuvre Warfare the SAF's Context, Approach, and Philosophy

The SAF has embraced manoeuvre warfare because it believes that as a warfighting philosophy, it can help overcome several constraints unique to Singapore. Firstly, in terms of geography, it lacks strategic depth and is required to defend Singapore against potential aggressors within a complex littoral region. Secondly, given population constraints, it will be unable to generate capability based on human mass. And thirdly, it will face budgetary constraints of slower economic growth in the future as compared to the past. Together, these constraints mean that the SAF needs a fighting philosophy that allows it to 'fight above its weight', producing results disproportionate to its size and capabilities.

A simplistic approach to manoeuvre only focuses on one or two dimensions. However, in the 'Information Age', conflict will be waged across a multi-dimensional battlespace and not merely be restricted to positional manoeuvres. In this complex and often confusing state, the SAF needs to target the enemy's centre of gravity – the mind of the enemy commander and the will of his forces to fight thereby offsetting strength through the defeat of the will to fight through a combination of well-integrated rapid and bewildering physical and non-physical operations. The aim is to avoid direct attack, but rendering the enemy inert by attacking the intangibles of war – political support, psychology, morale and fear. This detrimental psychological effect will ultimately collapse the enemy's will to fight. Even if the enemy has numbers and technology, without a will to win, he will be defeated.

Essentially, this is a dislocation philosophy of manoeuvre and provides an extremely economical means of defeating the enemy by setting aside the enemy's strength, rather than expending time, lives and resources to destroy him.[3] Hence, an appropriate definition of the SAF's concept of manoeuvre warfare is: "*an approach to operations in which shattering the enemy's overall cohesion and will to fight is paramount …by inflicting on him a series of rapid, violent and unexpected actions which create a turbulent and deteriorating situation in which he cannot cope.*"[4]

Why the Military Needs to Learn from Others

Studies have shown that armed forces that choose to think that they have a monopoly in skills of managing in highly complex uncertainty will become complacent and will adopt highly incremental approaches to adapting to chaos and trap themselves in an organisational treadmill, blinding themselves to new perspectives on tackling new issues and problems.[5] The results are 'bureaucratised' forces with authoritarian leaders with poor internal communications, ignoring possibilities and creativity.[6]

Moreover, modern technological developments have added an entirely new dimension of uncertainty and have so obfuscated the fundamental principles of strategy that any simple construction of conflict strategy is now impossible. As Michael Handel puts it,

"*The technological revolution that began to accelerate at a geometric pace after the mid nineteenth century has created a situation not unlike that facing scholars in the natural sciences: that is, the proliferation of specialised fields of research and the exponential growth in knowledge made it extremely unlikely that a single expert could cultivate an in-depth understanding of all the developments taking place. Just as it would hardly be possible to write one book encompassing the whole of modern science, it would be exceedingly difficult to compress all that is known and relevant about war into a single tome.*"[7]

What is needed is an 'interactive military' that is able to learn from other practitioners in other fields and change in line with long-term changes within society.[8] Unless military organizations start to learn 'best practices' from other disciplines and organisations, they will be unable to thrive in highly complex and changeable conditions. Instead, they will be trapped in a system where cultural values of stability and efficiency, mechanical technology, physical tasks, vertical hierarchies, and centralised power and control dominate over cultural values of change and problem solving, electronic technologies, mental tasks, horizontal hierarchies, and dispersed power and control.[9]

Learning from Business Six Concepts

This essay contends that the military has much to learn from business when it comes to thriving in an environment of high uncertainty and competition. In particular, some firms have been able to successfully apply some of the manoeuvre warfare concepts in highly innovative and creative situations that have seen them outsmart, outplay and outlast their rivals.

Given the context, there are six key manoeuvre warfare concepts that emerge. These are taken from the US Marine Corps publication, MCDP1 'Warfighting'.[10]

(1) Targeting critical vulnerabilities

(2) Boldness

(3) Focus

(4) Decentralised decision making

(5) Rapid tempo

(6) Integrated warfare

These will be defined individually below and will be illustrated with key examples from industry showing companies that have effectively employed them with possible lessons for the SAF. The subsequent discussion borrows heavily from concepts and ideas presented in an excellent article by Clemons and Santamaria in the April 2002 Harvard Business Review.[11]

Targeting Critical Vulnerabilities

A critical vulnerability is a characteristic or key element of a force that, if destroyed, captured or neutralised "will significantly undermine the fighting capability of the force and its centre of gravity."[12] A critical vulnerability is not just a weakness but any source of strength or power that is capable of being attacked or neutralised. A successful attack on a critical vulnerability should aim to achieve a decisive point in an operation or campaign. A force may have a number of critical vulnerabilities. The superior commander seeks to exploit these weaknesses that will cause major damage to the enemy.

In the maritime freight industry, DHL Worldwide Express in 1969 saw a critical vulnerability in the major industry players in the late 1960s. Then, ships' papers (or manifests) which must be presented at customs always travelled with the ships' cargo and this resulted in ships being held up at the destination port while the manifests were processed. Sending the manifests by postal mail failed as the mail service at that time was too slow, with ships arriving before the paperwork. DHL identified that if manifests were sent ahead by air, cargo could be cleared through customs before the ship arrived. The idea proved an overwhelming success as it shortened significantly the clearance and port turnaround times, saving their clients' money and raising each ship's earning capacity. More significantly, in a short time, the innovative offering of expedient, reliable, door-to-door service for one all-inclusive price dislocated the maritime freight industry and launched the international air express industry.[13]

The SAF must continually scan the environment in peacetime to analyse potential strengths, threats, weaknesses and opportunities. The SAF should continue to build up a comprehensive multi-spectrum and multi-agency intelligence network combined with strong analytical capabilities. In particular, with today's emphasis on fighting terrorism, many resources have to be put into human intelligence to infiltrate the terrorist networks. More importantly, good analysts are required. Like DHL which based its plans on what its own analysts saw as a chink in the major maritime freight players' armour, the SAF needs people who can think 'out-of-the-box' and see the weaknesses in the terrorists plans and develop strategies to target them. Coupled with this is the need for the SAF to reduce its own critical vulnerabilities. To keep ahead of the competition, as early as 1989, DHL exploited IT developments to be the first air express company to implement electronic submission of cargo manifests to customs. This initiative reduced the customs clearance process by half and cut down DHL's package delivery time by as much as half a day.[14]

Boldness

Manoeuvre warfare thrives on uncertainty and requires "a state of mind born of a bold will".[15] Modern conflict differs from the 'Industrial Age's' linear approach where the opposing forces' fronts and flanks delineated the battlefield. Non-linearity results from technological advances enabling land forces to manoeuvre, acquire and

engage targets throughout the battlespace. Rather than large units moving solidly in a single line of advance, warfare will be a more confused patchwork of dispositions, with friendly forces in front of, among and behind enemy forces. The battlefield will take on more of Sun Tzu's 'deceptive and formless' principle of warfare. In this context, it will sometimes take bold actions to see groundbreaking results where commanders exhibit "boldness, an exploitive mindset that takes full advantage of every opportunity, and the moral courage to accept responsibility for this type of behaviour".[16]

Boldness was a characteristic of the spirit that characterised many of the Chinese entrepreneurs who came to Singapore in the chaotic periods during the Opium Wars, Boxer Rebellion, and World Wars I and II. It was that of "a love for independence, adventure, enterprise, doggedness, righteousness and belligerence… and a sense of shrewdness and ruthlessness in business dealings."[17] The case of Tan Kah Kee is significant. When his father's business failed in 1904, with extraordinary fortitude, enterprise and risk-taking ability, he established his own business in pineapple canning, then diversified into rice milling. However, he soon made a risky decision to switch to rubber, then a very unproven product. The switch from rubber plantation to rubber manufacturing was a bold move, establishing him as one of Southeast Asia's most successful Chinese overseas businessmen. By the 1920s, he came to preside over a huge business empire which employed over 10,000 persons that extended into most East and Southeast Asian cities with interests like rubber plantation and manufacturing, shipping, import and export brokerage, real estate and rice trading.

The Economic Restructuring Committee has identified that boldness is a cultural characteristic that is distinctly lacking in Singaporeans.[18] However, this should not stop the SAF to identify and develop people with potential for boldness, especially among those with leadership potential. It is already an important selection criterion in the Special Operations Force (SOF) selection process and similar priority should be placed in the SAF's selection of officers and specialists. The US Marine Corps' Marine Corps Combat Development Command (MCCDC) has shown that in the rapidly changing future battlefields, soldiers who have high quality 'out-of-the-box' and bold thinking will operate better.[19] To facilitate this, pocket-sized booklets have been distributed to all Marines highlighting the latest draft concepts. Marines are encouraged to boldly write-in or visit special web sites and join in threaded discussion groups. The intent is to build individual Marines who will be able to capitalise on boldness and win on the modern battlefield.

Focus

To prevent dissipation of efforts, there is a need to provide unity, or focus, to the decentralised initiatives of manoeuvre warfare. In addition, with limited resources but the ability to exploit identified gaps quickly, manoeuvre warfare emphasises achieving local superiority and "often involves extremely high attrition of selected enemy forces where we have focused combat power against critical enemy weakness. Nonetheless, the aim of such attrition is not merely to reduce incrementally the enemy's physical strength. Rather, it is to contribute to the enemy's systemic disruption."[20]

Until recently, Nissan, the giant Japanese car maker was beset in huge debts and losses and had to accept an infusion in May 1999 of US$5 billion by Renault. To restore it to profit, Carlos Ghosn was brought in as Chief Operating Officer and he set about to give the company a focus on returning to profitability by reducing costs by 20%.[21] "Every day, [managers] wake up, they must look in the mirror and see a reduction of 25% or 30%." This was needed to help it focus on the real task at hand of returning to profitability by meeting the demands of customers for higher quality cars, instead of its problems of infighting among management, poor design, difficult union relationships and overcapacity. This was driven all the way down the Nissan hierarchy which saw centralised purchasing implemented and the reduction in numbers of basic chassis designs but with much higher quality. But Ghosn drove this focus beyond just the Nissan employees to reach that of affiliates and other suppliers by offering them deals: "cut costs by 20%, and they get more business and more security. If not, they lose Nissan's business." The result of re-focusing Nissan meant that it was able to harness enough resources to win back customers in major markets with its new higher-quality car designs that were also more profitable and regaining some of its market share so that by mid-2002, Nissan stock was soaring on the stock-exchanges.[22]

Until recently, the major constraint to the SAF was manpower resources. However, with the slow recovery from the Asian financial crisis as well as the after effects of September 11 hitting the global economy, defence budgets are also being constrained. However, the military are called to play increasing roles like more UN deployments and prosecuting the war against terrorism. Shrinking defence dollars will mean that improvements to future defence capabilities will hinge on creative solutions in defence procurement, work practices and processes. If focus is not maintained, resources will not be enough to meet the demands. Like Nissan, the SAF must look ahead and the resources available must be focussed on the Schwerpunkt. It could follow the US Army's model when it was forced, in the 1990s, with cuts in defence budgets after the Cold War, to create the 'Louisiana Manoeuvres Task Force', insulated from external interference, to challenge entrenched mindsets and develop innovative solutions to focus the organisation.[23]

Decentralized Decision Making

Auftragstaktik or decentralised decision making will help alleviate the problems of micro-management and compressed time-space for commanders.[24] This requires a commander to direct what is to be achieved by making his intentions thoroughly clear and allocating necessary resources to realise these intentions. However, he concedes to his subordinates the license to accomplish these tasks. It aims to capitalise on every opportunity that presents itself on the battlefield, reducing the requirement for detailed orders and coordination. General Patton once said, "Never tell people how to do things. Tell them what to do, and they will surprise you with their ingenuity."[25]

For businesses that attempt to enter the Chinese retail market, there has always been the dilemma of how much control to keep and how much to give away. Instead of retaining strict control and setting up proprietary branches, Ron Sim, the founder of Osim decided to work with franchisees and leave distribution to the people who knew the ground and concentrate on innovating Osim products to stay ahead of the competition from 1993 to 2002. Franchisees deal with the nitty-gritty of setting up outlets, of which there are at least 85 now in China, and Osim only maintains quality control over the service that he wants associated with the brand. To ensure that the quality ethos is developed across the franchisees, Osim provides the senior sales and marketing team to inculcate the right marketing and management philosophy for them. The result has been a success with Osim sales of health products in China bringing in US$10 million a year.[26]

To build this capability for decentralised decision-making, the SAF could possibly expand the 'Wrangler Teams' concept.[27] Besides just being small think tanks that address critical issues facing the SAF in the future, they could be given clear goals and actual resources to run real projects. A possible model is that of Microsoft's new-venture teams that give free reign to each member's creativity because their separate facilities and location free them from organisational rules and procedures. Such teams are typically small and loosely structured and include a mix of experience and personalities. They target people with 'bandwidth', a breadth of interest, and throw them together in mixed teams of 'nerds' and sensitive designers. They are given clear goals and the resources they require. The resulting creative tension produces unique and innovative results.[28]

Rapid Tempo

Time compression, not speed, defines the information age.[29] Tempo is the rhythm or rate of activity relative to the enemy, within tactical engagements and battles, and between operations.[30] Information sharing provides increased battlespace knowledge which should improve situational awareness which will increase the tempo a force can generate by increasing the friendly decision cycle and thus the ability to out manoeuvre the threat force. Here, "the relevant measure is not absolute speed. Rather, success is based on relative speed i.e. identifying opportunities and making decisions more quickly than one's opponent, thereby forcing him into a constant state of reaction."[31]

Creative Technology, the world's largest maker of soundcards for personal computers (PCs), under the leadership of Sim Wong Hoo, has set a rapid tempo to keep ahead of its potential competitors especially in the higher-end, higher margin markets.[32] It achieved an initial advantage in 1989 with the launch of the

Sound Blaster sound card that enabled IBM-compatible PCs to produce high quality audio. The Sound Blaster platform soon became the de facto industry-standard. However, it began to face competition from other sound card firms in the US like EMU and Aureal and from industry heavyweights like Intel, which produced the MMX chip to replace sound card technology. However, with its high tempo of innovation and Sim Wong Hoo's visionary leadership, Creative Technology has managed to stay ahead in the sound quality game with new generation multimedia audio products launched every 2 years or less from 1989 onwards.[33] The result is that Creative Technology has managed to acquire its competitors that have not been able to keep up with the innovation pace (EMU in 1993 and Aureal in 2001) while consolidating its position at the high-end of the multimedia market as the choice of gamers and multimedia enthusiasts worldwide, while consigning its potential competitors to the lower-end market.[34]

The SAF must develop intuitive commanders like Sim Wong Hoo who thrive in a time-compressed environment in peace or war. Training of commanders must promote decision and calmness in chaos. Disorder should be practised in day-to-day activity and promoted in culture. This conflicts with traditional military bureaucratic values and technocratic discipline that seek to impose routine, order and logic. Because chaos threatens peacetime efficiency and increases risk, it is generally avoided in the militaries. To substitute for the lack of chaos in peacetime, the SAF should maximise opportunities for future commanders to gain operational experience in its widest sense and UN tours should be made compulsory for Regular officers.

Integrated Warfare

To make manoeuvre warfare work effectively, all the previous elements need to work together. The joint effects of the integration of elements will be greater than the sum of individual effects. This is in line with the SAF's approach to integrated warfare, and is acknowledged in Defending Singapore in the 21st Century, "Superior numbers in platforms…will become less of an advantage unless all these platforms can be integrated into a unified, flexible and effective fighting system."[35]

Acer Computers has grown from strength to strength by adopting many of the elements highlighted above in an integrated manner.[36] In the Taiwanese PC industry, many players closed down in the 1990s as they could not break out from the 'cloning' practices of the 1970s and 80s that gave an image of low price and low quality. Acer Computers, despite strong competition and limited resources, under the charge of Stan Shih, was able to do that by targeting the critical vulnerabilities of product quality and delivery efficiency among other players. It built up strong relationships with component suppliers as well as developed manufacturing processes that allowed it to halve the actual time taken to design and produce new motherboards for new CPU chips. This resulted in greater speed, something that the company thrived on since its early days of cloning IBM PCs. Its culture for high tolerance of errors also fosters an attitude of boldness among its managers and employees. To ensure that its junior hierarchy are equipped to make decentralised decisions, the company's coaching philosophy is that of "being a tutor who conceals nothing from the pupils." This is translated into employees being rewarded by being given the opportunity to run small business units that are more entrepreneurial and responsive, thereby increasing the tempo. Focussing the company's efforts is the overall vision of making Acer into a "worldwide alliance of borderless global companies". This integrated effort has seen Acer rise above its peers and establish itself with a strong reputation among global PC producers.

For the SAF to achieve the full capabilities the various aspects must work together and as war becomes faster and more complex, the need for tighter co-operation among branches and services becomes greater. Jointness will be facilitated with the integration of C4ISR and doctrine across services with more forces incorporating air, land, sea, and space elements in the future.[37] This may see the SAF moving more towards joint headquarters removing component commands,[38] and perhaps doing away with service divisions, creating true joint organisations along the lines of the US Marine Corps.

Conclusion

This essay has shown that manoeuvre warfare is being practiced daily in many corporate firms today and is useful in the often chaotic, ever-changing business environment. Manoeuvre warfare is attractive because it works to create and exploit an advantage as a means of defeating an opponent quickly, effectively and economically.

In times of armed conflict, like that which is seen in the highly competitive commercial environment, manoeuvre warfare concepts provides a means to 'fight smart' and be a protocol for success in battle that strives to take advantage of the friction, uncertainty, fluidity, disorder, violence and danger of the war environment to undermine the will of the opposition and quickly force a favourable outcome. Thus, over the long term, the SAF must ensure that its mastery of manoeuvre warfare principles evolves ahead of competitors. Only by so doing can it ride the waves of uncertainty and stay ahead of its potential adversaries.

Endnotes

1 Quoted in Boyle, E. 2001, *Once Tempted*, Avon, New York.

2 'The Future of Warfare', *The Economist*, 8 March 1997, p 21.

3 Leonhard, R. 1998, *The Principles of War for the Information Age*, Presidio Press, Novato, CA, p 255.

4 British Army 1996, *Design for Military Operations – The British Military Doctrine*, pp 4-21 to 4-22.

5 Sullivan, G.R. & Harper, M.V. 1996, *Hope is not a method: what business leaders can learn from America's army*, New York, Times Business, Chapter 2.

6 O. Dunivin, K. 1994, 'Army Culture: Change and Continuity', *Armed Forces and Society*, Vol 20, No 4, Summer 1994, pp.531-547; Phelps, M.L. 1997, 'The Australian Army's Culture: From Institutional Warrior to Pragmatic Professional', ADF Journal, No 123, March/April 1997, pp. 37-43.

7 Michael I. Handel, 1996, *Masters of War: Classical Strategic Thought*, 2nd edition, London, p 2.

8 Smith, H., Sutcliffe, K., Jones, K. & Spurling, K., *Economic, Social and Political Trends in the Years up to 2020*, Australian Defence Studies Centre, Australian Defence Force Academy, October 1989, p. xiii.

9 Byrne, J. A. 1992, 'Paradigms for Postmodern Managers', *Reinventing America, Business Week*, pp 62-63; Land, G & Jarman, B. 1992, *Breakpoint and Beyond*, New York, Harper Business.

10 US Marine Corps 1997, *MCDP1 'Warfighting'*, Chapter 4.

11 Clemons, E. K. & Santamaria, J.A. 2002, 'Maneuver Warfare – Can Modern Military Strategy Lead You to Victory', *Harvard Business Review*, Apr 2002, pp 57-65.

12 Australian Army 2002, *Land Warfare Doctrine 1: The Fundamentals of Land Warfare*, Doctrine Wing, CATDC.

13 For more details, see Tan, M. & Neo, B. S. 1996, 'DHL Air Express: Exploiting IT for Market Leadership and Process Innovation', in Neo, B. S. 1996 (ed), *Exploiting information technology for business competitiveness : cases and insights from Singapore-based organizations*, Singapore, Addison-Wesley Pub. Co.

14 Then, J. 1993, 'Case Study on DHL,' *Computerworld Southeast Asia*, 21 May 1993

15 US Marine Corps 1997, *MCDP1 'Warfighting'*, Chapter 4.

16 US Marine Corps 1997, *MCDP1 'Warfighting'*, Chapter 4.

17 Yong, C.F. 1987, *Tan Kah Kee: The Making of an Overseas Chinese Legend*, Oxford University Press, Singapore

18 Ministry of Trade and Industry, 2002, *Report by Sub-Committee on Enhancing Human Capital*, Singapore, Chapter 2.

19 Rhodes, J.E. 1998, 'Every Marine an Innovator', *Marine Corps Gazette*, Jan 1998, pp 40-41.

20 US Marine Corps 1997, *MCDP1 'Warfighting'*, Chapter 4.

21 'Remaking Nissan', *Businessweek*, 15 Nov 1999

22 'Commentary: Ghosn's Way: Why Japan Inc. Is Following a Gaijin', *Businessweek*, 20 May 2002; 'The Man Who Steered Renault to Japan', *Businessweek*, 13 Jan 2003

23 U.S. Department of the Army, 1995, *Force XXI, America's Army of the 21st Century: Meeting the 21st Century Challenge*, Fort Monroe.

24 Lind, W.S. 1985, *Manoeuvre Warfare Handbook*, Westview Press, Boulder, p 13.

25 Quoted in Clemons, E. K. & Santamaria, J.A. 2002, op cit, p 62.

26 'That Midas Touch', *The Straits Times*, 23 Nov 2002

27 'Manpower Policies' supplement, *Pointer*, Feb 1982, p. 10.

28 Micklethwait, J. and Woolridge, A. 1997, *The Witch Doctors*, Random House, London, p. 147.

29 Sullivan, G.R. and Harper, M.V., 1996, op cit, p 48.

30 Australian Army 2002, *Land Warfare Doctrine 1: The Fundamentals of Land Warfare*, Doctrine Wing, CATDC.

31 Clemons, E. K. & Santamaria, J.A. 2002, op cit, p 62.

32 Cane, A., 2000, 'CREATIVE TECHNOLOGY: A blast of entrepreneurial spirit', *FT.Com* http://specials.ft.com/ln/ ftsurveys/country/sing_bus.htm (downloaded 15 Dec 2001)

33 The 1989 introduction of the Sound Blaster card was followed by the launch of the Sound Blaster Pro card in 1991 offering stereo sound, the Sound Blaster 16 card in 1992 offering 16-bit CD quality sound, the Sound Blaster AWE card in 1993 offering 32-bit Wavetable synthesis, the Sound Blaster EAX card in 1998 offering enhanced 3D sound effects, and the latest Sound Blaster Audigy audio processor in 2001 with enhanced digital music creation effects.

34 Pfetsch, S & Lee, E. W., 2000, *Asia's Toughest Companies: Creative Technology Ltd*, Presentation to Nanyang Business School, Nanyang Technological University, Singapore, 31 Jan 2000.

35 *Defending Singapore in the 21st Century*, Ministry of Defence, Singapore, p. 10.

36 Trompenaars, F. and Hampden-Turner, C. H. 2002, *21 Leaders for the 21st Century*, McGraw-Hill, New York, Chapter 12.

37 Miller, P.D. 1993, 'A New Mission for Atlantic Command', *Joint Force Quarterly*, No 1, Summer 1993, pp 80-87.

38 Ankersen, C.P. 1998, 'A Little Bit Joint - Component Commands: Seams, Not Synergy', *Joint Force Quarterly*, Spring 1998, p 118.

Bibliography

Ankersen, C.P. 1998, 'A Little Bit Joint - Component Commands: Seams, Not Synergy', *Joint Force Quarterly*, Spring 1998, p 118.

Australian Army 2002, *Land Warfare Doctrine 1: The Fundamentals of Land Warfare*, Doctrine Wing, CATDC.

Boyle, E. 2001, *Once Tempted*, Avon, New York.

British Army 1996, *Design for Military Operations – The British Military Doctrine*.

Byrne, J. A. 1992, 'Paradigms for Postmodern Managers', *Reinventing America, Business Week*, pp 62-63

Cane, A., 2000, 'CREATIVE TECHNOLOGY: A blast of entrepreneurial spirit', *FT.Com* http://specials.ft.com/ln/ ftsurveys/country/sing_bus.htm (downloaded 15 Dec 2001)

Clemons, E. K. & Santamaria, J.A. 2002, 'Manoeuvre Warfare – Can Modern Military Strategy Lead You to Victory',*Harvard Business Review*, Apr 2002, pp 3-10.

'Commentary: Ghosn's Way: Why Japan Inc. Is Following a Gaijin', *Businessweek*, 20 May 2002

Defending Singapore in the 21st Century, Ministry of Defence, Singapore

Kotler, P., Ang, S.W., Leong, S.H. & Tan, C.T., 1999, *Marketing Management - An Asian Perspective*, 2nd Ed, Prentice Hall, Singapore.

Land, G & Jarman, B. 1992, *Breakpoint and Beyond*, New York, Harper Business.

Leonhard, R. 1998, *The Principles of War for the Information Age*, Presidio Press, Novato, CA.

Lind, W.S. 1985, *Manoeuvre Warfare Handbook*, Westview Press, Boulder.

'Manpower Policies' supplement, *Pointer*, Feb 1982.

Michael I. Handel, 1996, *Masters of War: Classical Strategic Thought*, 2nd edition, London.

Michael Noll A., 1997, *Highway of Dreams: A Critical View Along the Information Superhighway*, Lawrence Erlbaum Associates, NJ.

Micklethwait, J. and Woolridge, A. 1997, *The Witch Doctors*, Random House, London.

Miller, P.D. 1993, 'A New Mission for Atlantic Command', *Joint Force Quarterly*, No 1, Summer 1993, pp 80-87.

Ministry of Trade and Industry, 2002, *Report by Sub-Committee on Enhancing Human Capital*, Singapore.

Neo, B. S. 1996 (ed), Exploiting information technology for business competitiveness : cases and insights from Singapore-based organizations, Singapore, Addison-Wesley Pub. Co.

O. Dunivin, K. 1994, 'Army Culture: Change and Continuity', *Armed Forces and Society*, Vol 20, No 4, Summer 1994, pp.531-547.

Pfetsch, S & Lee, E. W., 2000, *Asia's Toughest Companies: Creative Technology Ltd*, Presentation to Nanyang Business School, Nanyang Technological University, Singapore, 31 Jan 2000.

Phelps, M.L. 1997, 'The Australian Army's Culture: From Institutional Warrior to Pragmatic Professional', *ADF Journal*, No 123, March/April 1997, pp. 37-43.

'Remaking Nissan', *Businessweek*, 15 Nov 1999

Rhodes, J.E. 1998, 'Every Marine an Innovator', *Marine Corps Gazette*, Jan 1998, pp 40-41.

Smith, H., Sutcliffe, K., Jones, K. & Spurling, K., *Economic, Social and Political Trends in the Years up to 2020*, Australian Defence Studies Centre, Australian Defence Force Academy, October 1989.

Sullivan, G.R. & Harper, M.V. 1996, *Hope is not a method: what business leaders can learn from America's army*, New York, Times Business.

'The Future of Warfare', *The Economist*, 8 March 1997.

'The Man Who Steered Renault to Japan', *Businessweek*, 13 Jan 2003

'That Midas Touch', *The Straits Times*, 23 Nov 2002

Then, J. 1993, 'Case Study on DHL,' *Computerworld Southeast Asia*, 21 May 1993

Trompenaars, F. and Hampden-Turner, C. H. 2002, *21 Leaders for the 21st Century*, McGraw-Hill, New York

U.S. Department of the Army, 1995, Force XXI, *America's Army of the 21st Century: Meeting the 21st Century Challenge*, Fort Monroe.

U.S. Marine Corps 1997, *MCDP1 'Warfighting'*.

Yong, C.F. 1987, *Tan Kah Kee: The Making of an Overseas Chinese Legend*, Oxford University Press, Singapore

The online version has been revised by the author as of 9 Jan 2004.

MAJ (NS) Seet Pi-Shen is a Guards Officer by vocation and was a Section Head at HQ Supply & Transport when he contributed this essay. He is now pursuing a PhD at the Judge Institute of Management, University of Cambridge. He is also currently the Business Strategy & Development Director for AML Sci-Ed Consultants, Pte Ltd. He graduated with a BA *(2nd Class Upper Honours)* in Philosophy, Politics and Economics from Oxford University in 1992 and obtained a Master in Defence Studies, University of Canberra, in 1999. He also attended the Australian Army Command and Staff Course (Fort Queenscliff) 1999. MAJ (NS) Seet won a Merit Award in last year's competition.

Competing to Stay Ahead: Interservice Competition as a Solution and not a Problem

by MAJ Kwek Ju-Hon

Interservice competition is a much-maligned phenomenon.

Received wisdom from recent military history is that rivalry between the services lies at the root of many of the modern military's failures. Among them wasteful duplication in force structure, parochialism in strategic outlook, and a general lack of interoperability between the military's various branches. Infamous examples of military failure have become test cases for the ills of interservice rivalry. Perhaps most compelling is an anecdote from the 1983 US invasion of Grenada. The scene: an Army unit in urgent need of close air support; Navy aircraft fly overhead and the carrier USS Independence looms in the distance. An officer is crouched in the booth of a local payphone, desperately using his personal telephone calling card to make an international call to his divisional headquarters in Fort Bragg, North Carolina. The urgent request is eventually routed to the Navy, and then back to the nearby carrier. The reason for this predicament? A lack of common frequencies between Army and Navy radios.[1]

Jointness is seen as the panacea to the ills of interservice competition. The official literature of almost every armed force extols the merits of integration how the various services working together provide a greater capability than the sum of their individual parts, and how joint solutions offer efficiency savings through rationalisation and the elimination of wasteful duplication. It seems that with more jointness, one cannot go wrong.

This paper seeks to challenge that assumption, and its corollary that competition within the armed forces is inherently undesirable. While repeats of the negative instances of interservice competition are certainly worth avoiding, recent history provides several powerful counter-examples of how under the right conditions such internal competition can be a powerful source of innovation.[2] The tensions borne of competition, when properly channelled, can serve as a powerful source of energy to drive a military organisation forward. The implication to senior leadership is that it should invest less of its energies in suppressing internal rivalries, and focus more of its efforts towards creating the right conditions for effective internal competition.

The Debate over Interservice Competition

It is often remarked that though it is a single nation, the US has four air forces, three armies, two strategic missile forces, and one and a half navies. Such duplication is said to be the result of allowing the services too free a hand in defining and lobbying for their requirements. The Army, Navy, Air Force, and Marines are all budget-maximising bureaucratic entities, each with institutional personalities that drive self-interested behaviour. The result is wasteful duplication that takes place at a tremendous cost to the taxpayer. Billions could be saved a year through the centralised consolidation of requirements, and sharing of capabilities through integration.

Beyond the pecuniary costs of interservice competition, there exist what might be termed bureaucratic costs. In peacetime (and sometimes even at war) the services spend as much time fighting one another as they do preparing to fight the enemy. Each service is bound by a certain parochialism in its outlook borne of a distinct strategic paradigm that has emerged in the course of coping with the unique challenges of its operating medium. Ideas that fall outside of this paradigm will be energetically refuted. The Navy, for example, with its entrenched sense of independence, will jealously guard its capital ships. The Air Force, with its image as wielder of the decisive instrument of war, will be quick to quash any suggestions that it should acquire anything but the fastest-flying and most technologically advanced manned aircraft.[3]

Interservice competition is the norm rather than the exception. Bill Owens, a former Vice-Chairman of the US Joint Chiefs of Staff admits that "unfortunately, many military people are incapable of distinguishing between pride and blind loyalty to their specific military service." He notes that "this rivalry is formed at the earliest moments in a military career," and often enough "become(s) institutionalised in the interservice competition for budget funds, or when the Joint Chiefs of Staffs have to decide which service will lead an emergency joint task force at the outbreak of a crisis."[4]

Owens cites the infamously botched rescue attempt in the 1980 Iran hostage crisis to illustrate how bureaucratic costs can severely impinge on operational effectiveness. What was meant to be a covert night operation by a lean group of special forces ballooned into a overt operation conducted in broad daylight involving an unwieldy patchwork of Army commandos, Navy helicopters, Air Force transport planes, and Marine aviators. Operational efficiency gave way to service parochialism as every service lobbied for, and got, a piece of the action. The results were disastrous: several helicopters failing to reach to site due to miscommunication, a collision between a helicopter and C-130 that costs eight lives, and an aborted raid.[5]

Jointness as the Solution?

With these failings in mind, most modern militaries have found an intuitively obvious solution in jointness. Indeed the institutional histories of many western militaries could be sketched out in terms of an ongoing struggle to impose a degree of jointness and integration over often reluctant services.

In the post-World War II United States, intense interservice squabbling over roles and missions between the Army, Navy, and a newly created Air Force precipitated the National Security Act of 1947. This was a far-reaching attempt to unify the Armed Forces through the creation of the Joint Chiefs of Staff. The Joint Chiefs of Staff functioned as a committee of autonomous service heads who were meant to rise above their services' interests to contribute a unified military perspective to national security issues. Jointness was further entrenched through a system of regional Commander-in-Chiefs (CINCs), four-star flag officers who were responsible for planning and conducting operations with forces drawn from all services.[6]

Over the years, the norm of jointness was gradually imposed top down, even in the face of internal resistance. Organisations and resources were centralised, and doctrines and commands integrated. Jointness reached its apogee with the Department of Defense Reorganisation Act of 1986 (more commonly known as the Goldwater-Nichols Act). The Act aimed itself at addressing the remaining maladies of interservice competition by taking jointness to new heights. It enlarged the authority of the Chairman of the Joint Chiefs of Staff and provided him with independent staff. In addition the Act mandated the development of a joint perspective through the creation of a joint career track, and the insistence that senior officers served in a joint billet as part of the criteria for promotion to flag rank. Finally, to address the problem of service parochialism obstructing operational effectiveness, it removed service chiefs and service secretaries from operational command responsibilities. The chain of command was ran from the President to the Secretary of Defense, directly to the CINCs.[7]

Some have suggested that even these latest efforts at jointness have not gone far enough. Bill Owens argues that much more radical change is needed. He goes so far as to suggest removing the power to make decisions on research and the procurement of major weapons systems from the individual services. These powers should be concentrated in a joint requirements committee chaired by the Secretary of Deputy Secretary of Defense. Owens also advocates consolidating all of the military's intelligence, communications, logistics, and medical capabilities under a single joint command.[8]

The Problems with Jointness

So jointness is the answer to the major problems facing the military.

Or is it?

The case for increasing jointness certainly seems compelling. Indeed it has become such a mantra in the minds of modern military professionals that it is may seem like heresy to even suggest that jointness may have a down side. But a change of perspective can free the mind. And the lenses of economics make possible such liberation.

Under the rubric of economics, modern armed forces are an almost perfect fit with the profile of a monopoly. Armed forces are unitary organisations with no competitors. In peacetime, they operate in an environment of high (and state enforced) barriers to entry. In the absence of competitive pressures, they make decisions through rule-based systems, much in the manner of a command economy. If corporate mergers are the economic equivalent of jointness, then moves to integrate the various services are analogous to an ongoing large-scale merger aimed at creating an integrated defence conglomerate.

The benefits of the defence monopoly are similar to those associated with other corporate monopolies: lower costs from rationalisation, economies of scale, an end to "wasteful" competition, and an increased capacity for technological progress through the pooling of resources for research and development. But monopolies come at a cost: monopoly power, higher prices, a lack of innovation and inefficiency. Management in a monopoly is much more susceptible to group-think and inertia. Lacking the diversity of thought, and the incentive to innovate that is forced by competitive pressures, a monopoly becomes increasingly unwieldy and insufficiently agile to adapt to the rapidly changing realities of the market.

Intuitively we prefer a free market system to centrally planned economies, and competition to monopoly. In a competitive private economy, firms do not remain static. Their environments are subject to continuous change, and they are forced to search for new markets, products, methods of production and in-house forms of industrial organisation. The great irony that emerges is that while we prefer competition in every other field, we seem intent on removing it from the military in an unstoppable march towards greater jointness.

Defence as a Natural Monopoly?

It has been suggested that defence is a natural monopoly, and that some of the problems inherent in jointness can be solved by having competition at the level of defence industries. Fierce competition between defence contractors should guarantee innovation in military technologies, or so it is thought. Several years ago, the US Department of Defense put a halt to the wave of mergers and acquisitions that were forced by the defence cutbacks of the early 1990s. Deputy Secretary John Hamre and Under-Secretary for Acquisition and Technology Jacques Gansler argued that any further reduction in the number of firms in key defence markets would impair the military's ability to obtain innovative and cost effective weapons. Such fears led the Department of Defense to reject a number of proposed mergers, for example between Lockheed Martin and Northrop Grumman.[9]

Though they recognise the importance of competition, such policies ignore the root cause of the very problem they aim to address. Vertical and horizontal concentration among defence firms does not threaten the defence establishment's efficiency and effectiveness. The real threat comes not from the sellers of weapons, but from the buyers. The US market for defence goods (and for that matter, the market in any other country) is hardly a normal market. The simple reality is that there is a single buyer the government. Even when defence contractors want to sell military equipment to other governments, they must have the government's permission and often assistance to market and support their products.

The number of suppliers in a given market is irrelevant if there is only one buyer. Economists term this a monopsonist. Whether there are ten sellers or one, every seller must respond to the preferences of the monopsonist or else be forced out of business. Sellers in the market are foolish to antagonise the monopsonist. Interservice competition breaks this "monopsony". Because each military service strives to pursue its own agenda, several quasi-autonomous entities represent the government. Gholz and Sapolsky's hypothesis is that "rivalry among the services or lack of it determines the rate and direction of innovation in weapon systems. Such rivalry is necessary for meaningful competition among contractors and government facilities that conceive and develop innovative technologies."[10] But as they point out, for many years, and with increasing success, governments have been trying hard to suppress it.

The buyer side competition that prevailed during World War II and in the early phases of the Cold War was stamped out in the 1960s. In an effort to contain procurement costs, then Secretary of Defense Robert McNamara tried to suppress interservice rivalry by encouraging the services to adopt as much commonality as possible in their weapon designs.[11] The flagship of these efforts was the TFX project, an effort to develop a multi-role aircraft for both the Air Force and the Navy. Neither service wanted nor needed the same aircraft and both resisted cooperating. The Navy eventually completely withdrew from the project and purchased its own aircraft. The TFX morphed into the Air Force's F-111 fighter-bomber, an expensive system yet unremarkable system that came late into operational life. The TFX example illustrates a key pitfall of joint procurement procedures: "the lowest common denominator is used in the resolution of differences in service positions, adding together these requests rather than making hard choices either between services or between operational theatres."[12]

The latest incarnation of joint procurement is the Joint Strike Fighter (JSF), which involves collaboration between the airforce, marines, navy and several other nations in the development of three versions of a lightweight and versatile combat aircraft. Given the resources that have been invested into the JSF, it is likely that there will not be another major fighter aircraft development project for quite some time. By 2010 all of America's tactical aircraft technology will be targeted at this single project. While the JSF itself promises to be a cutting-edge system, if the programme runs into problems, or if unexpected operational needs develop, the US will have no alternatives at hand.

The strength of the services is that they develop their own competencies, and in doing so generate a multiplicity of choices. If there is only one (joint) template, then the chance of getting it wrong is multiplied. Sapolsky and Gholz take the extreme view of the Joint Strike Fighter as part of the "misguided drive to avoid duplication in weapons development (which) has expanded to a new, pernicious level under the banner of jointness" that amounts to "a danger to national security."[13]

Interservice Competition as the Solution?

There are three significant advantages to inter-service competition. First, it helps generate vital information. As budget maximising bureaucracies, defence ministries and armed forces have every incentive to over-estimate the threat and under-estimate the cost of their preferred policies. While the Air Force, for example, might not come clean on its vulnerabilities, the Army and Navy certainly will. What is the importance of air superiority in an age of effective long range Surface to Air Missiles? Can fighters be replaced with unmanned combat aircraft? Does air power provide the flexibility of response required in modern conflicts? By all means ask the Air Force; but ask the Army and Navy as well.

Second, interservice competition makes available a diversity of policy alternatives. In its worst form, jointness can create opportunities for collusion between the services. Effective interservice competition prevents such collusion and generates a vigorous level of debate over alternatives, which is a necessary precursor to informed decision. Duplication is wasteful unless it is harnessed to generate policy options and comparisons. In today's uncertain world, it is best to have a portfolio of multiple perspectives on defence issues.

Third, competition spurs innovation. When there is the promise of significant reward or loss, the services may offer up not just information about their rivals but also new ideas for improving military capabilities. Recent military history provides evidence (discussed below) to show how under the right conditions, interservice competition has been a powerful force for innovation that has helped the armed forces transform to meet new challenges. Services, feeling their raison d'être threatened by the rise of a new technology, threat or operational need, have risen to the challenge by developing innovative approaches which sustain their relevance.

While clearly not the only candidates to provide internal competition, the services, with their distinctive identities, unique traditions, and organisational wherewithal, are ready-made competitors. Most importantly they meet a key condition that is crucial for effective competition - they are a set of relatively secure organisations that can still be made to feel uncertain about their futures. Organisations threatened with

imminent demise cannot function. Their ability to plan is crippled by the insecurity of their employees. Conversely, organisations that are totally secure are subject to the inertia of the incumbent, which makes creative ideas a rare and urgency of action difficult to arouse. "Pushed to worry about their futures, but not slated for quick disbandment, the services would have the resources, time, and need to think hard about their special talents and contributions to national security."[14]

Competition in Action: the Emergence of Air Power

The history of the emergence and subsequent development of the air power is rich with examples of the potentially benign effects of interservice competition. A hundred years ago, the land and the sea were the only two domains of warfare, and were each the undisputed domain of armies and navies respectively. Aside from occasional interactions at the interfaces shore bombardment, coastal defence artillery and raids ashore armies and navies could discount the threat of encroachment from other domains by their opposites.

But aviation technology changed this. Military operations in the air blurred the sharp distinction between the land and sea, and armies and navies found that they needed to operate in the air in order to secure their operations in their proprietary spaces. Early air planes were used by armies and navies only for supporting operations like reconnaissance and artillery spotting. But the airmen had their own ideas. In developing the technological and doctrinal means of delivering massed destructive power from the air, they came to challenge the relevance of forces constrained to operations on land and sea.[15]

The creation of air forces as independent services precipitated fierce debates over the rightful roles and missions of each branch of the armed forces. Independent air forces became the norm only after World War II. The US Air Force, for example, was created in 1947, at a time of struggle for strategic and budgetary dominance that had been triggered by deep post-war budget cuts, and a sense of awe at the destructive power of the atom bomb. Politicians saw nuclear weapons as the obvious answer to a numerically superior foe that was apparently willing to take large casualties on the conventional battlefield. This was certainly cheaper than a build up based on conventional weapons. Despite its relative youth, the US Airforce managed to sell the concept of strategic bombing, and consequently won jurisdiction over ballistic missile development, and with it the lion's share of available defence resources.

The Navy did not take this sitting down. Unwilling to accept second place behind the Air Force, it embarked of a series of experiments in operational concepts and technologies aimed at re-establishing its primacy as a service. Most notable among its successes was the conception of the Polaris Missile as an alternative to the Air Force's strategic nuclear missiles. The Polaris was revolutionary on two counts. First it was a solid fuelled missile, making it safer to launch than the Air Force liquid-fuelled missile systems. Second, it was fired from a submarine, making it much less vulnerable to attack than land based aircraft and missiles. The Polaris reduced the need to deploy hundreds of vulnerable, and not to mention costly, strategic bombers and liquid-fuelled missiles that the airforce was developing.[16]

In the race with the Soviet Union to develop a secure nuclear deterrent, it was competition among the services that led quickly to the right answer. Without the competition, unwelcome as it may have been to the Air Force, the US would have had to work iteratively through a painfully long and costly sequence of bombers and land based liquid-fuelled ballistic missiles before stumbling on the submarine based system. In fact, it might not have found that solution at all.

In addition to Polaris, the Navy also developed more effective tactical aircraft than the Air Force, which remained blinkered by the widespread acceptance of the importance of its strategic bombing role. So significant was the Navy's lead that the Air Force was forced to use Navy-designed aircraft and tactics during the Vietnam War. And neither did the Army stand still. After faltering in its initial attempts to join the domestic nuclear arms race, it began to challenge the emphasis on strategic nuclear systems by promoting a renewed focus on conventional warfare. Innovations like the Green Berets, attack helicopters, and air assault tactics were the result. These have proved indispensable to conflicts in the present "post-nuclear" age.

By the 1990's the cycle of competition had come full circle. Worried about its ability to fight and win in conventional wars, the Air Force worked hard to improve its performance in air superiority, battlefield interdiction and close air support. By the time of the Gulf War and air campaign in Kosovo, the Air Force was well-equipped for crucial tactical roles like precision bombing and the suppression of enemy air defences.

"Because of competition that has prevailed among the armed services (and between the services and the intelligence agencies), the US military has better attack helicopters, amphibious warfare capabilities, satellite communications and surveillance systems and special operations forces than it would have had absent the competition."[17] Even among public bureaucracies, competition is an excellent spur to innovation.

These examples follow a predictable pattern. The emergence of a new technology, the creation of new roles that do not fit neatly into a particular service's exclusive operational domain, and the subsequent realisation by the service that if expanded, these may come to challenge their pre-eminence in traditional areas. Classic turf battles such as these occur at the margins between of domains dominated by the respective services. In the early 20th century the new medium was the air, and the supporting disruptive technologies were nuclear missiles and aviation.

Effective Competition

The problem, of course, is that competitors try their best to avoid competition. Collusion is preferred as it allows for mutual benefit. In private markets, antitrust laws exist to protect consumers from collusion among firms. There is no similar shield against collusion between non-profit organisations, least of all the armed forces. Jointness among services can become a shield against being played off against one another. Tradeoffs are made on the friendliest possible terms, with the threat of retaliation if a particular service's most important needs are not met.

Likewise, even intense competition can also be stifling to innovation if it takes place under the wrong conditions. Where collusion is impossible, rather than competing by innovating and moving ahead, services may use their unique advantages to block advancement by their competitors. The airforce may be unwilling to lend its resources to the Navy's experiments in maritime air operations, or the Navy may find a host reasons to torpedo an Army amphibious concept that diminishes the role of capital ships.

The early history of British carrier aviation illustrates the pernicious effects of competition under the wrong conditions. At the end of World War I, Britain was the only country with aircraft carriers. The Royal Navy was already using adept at conducting the sorts of missions that characterised mature operations of other navies during World War II. Yet by the outbreak of World War II, the British were outclassed in this field by their American and Japanese counterparts. Why the change of fortunes?

Ineffective competition explains part of the story. When the Royal Air Force was established as a separate service in 1918, the decision was taken to centralise the procurement and operation of all aircraft. The Naval Air Service was fully subsumed into the new Air Force, thereby stifling the Navy's nascent interest in aviation.

The Royal Air Force saw strategic bombing as its primary mission, and since it controlled all aircraft in Britain, the Royal Navy had to put forward its ideas for aviation to a predictably hostile Air Ministry. Furthermore, all naval links with the aviation industry were cut, and the Royal Navy lost a 60,000 strong naval aviation community. The loss of naval aviators who believed in the potential of aircraft carriers eliminated the counterweight to the naval gunnery community. This materially affected conceptions of how aircraft should be used in naval warfare.[18]

The fateful decision to centralise all aircraft under the Royal Air Force essentially amounted to the conferment of monopoly rights over aviation. Instead of exploiting the competitive tension inherent in the overlap of capabilities, the Air Force was given inordinate power to determine the terms on which its competitor would compete. British naval aviation thus fell far behind.

Operationalising Interservice Competition: So What Next?

The hypothesis of this paper has been that effective internal competition is essential for the armed forces to move ahead to meet the uncertainties of the future. What then are the implications on the present?

The biggest change would come in the role of joint staff. Joint staffs have traditionally seen their roles primarily in terms of promoting coordination and integration. Under a new norm of interservice competition, rather than reining in the services and suppressing existing rivalries, joint staffs should instead concern themselves with identifying appropriate competitive spaces, and ensuring the right conditions are in place in each of those spaces for interservice rivalries to be played out towards productive ends. To tap the benefits of interservice competition, joint staff will have to perform two distinct roles: that of market maker, and that of regulator.

Competition yields greater benefits in some fields than others, and so the appropriate competitive spaces need to be clearly identified by the market makers of joint. For obvious reasons, these are more likely to be found in functional areas of long term planning and acquisitions, and in the development of operational concepts, rather than in the actual conduct of operations. Competitive spaces form naturally around disruptive technologies that straddle service specific boundaries. Historical examples discussed above were aviation and nuclear weapons. Future rivalries are most likely to emerge with the emergence of new technologies which extend warfare into previously untouched domains such as space, or even cyberspace.

Within each competitive space, joint staff should develop a broad understanding of future challenges, and frame these appropriately such that they can be thrown out to the services to find operational solutions, with the carrot of generous start-up funding for promising ideas. Joint staff would then take on the role of a venture capitalist, seeding interesting new ideas, managing a portfolio of concepts and technologies, and bringing the successful ones to market through their implementation. Services that develop a successful operational concept or technology could be rewarded not just with developmental funds, but by being given custody over the assets and budgetary resources that arise from their implementation. Over time, services would be able to grow and morph in accordance with their ability to meet the operational challenges of the day.

Indeed competition need not be limited solely to the services. The services are the obvious initial choices simply because they are well established. However, in a well functioning competitive system, it is plausible that groups that do not map neatly onto existing service boundaries could emerge to conceive and implement new ideas, possibly even planting the seeds of a new independent service. The thought of moving beyond the existing services may sound preposterous, until we reflect on the relative youth of most air forces (creations of the post-World War II era). The same could be said of the US Marines, who gained independent status only in 1952.

The second role that joint staff needs to perform is that of regulator. It must create and maintain the conditions not just for competition *per se*, but for effective competition. The reality is that competitors do not like to compete. Where possible, they will collude. Where collusion is impossible, they will use their power to obstruct the progress of their rivals. Joint staff will need to formulate and police the equivalent of anti-trust regulations to ensure that services do actually compete, and that their competitive energies are channelled towards a productive purpose. Such regulations would constitute the "rules of engagement" between the services as they face each other across a particular competitive space.

Finally, to promote the development of the internal market, joint staff should focus its attention on the creation of certain common standards across the market. These would form a common backbone of against which competition takes place. An example of this would be the establishment of common Command and Control (C2) protocols. These would serve to ensure the future capacity for integration among the multiplicity of systems that result from interservice competition. The market is strengthened by with a common basis for competition, much in the way that GSM protocls or standard computing languages have contributed to the development of the mobile phone and software industries. Competition is fierce, but the resultant products are fully interoperable.

Interservice competition requires a tolerance for duplication and messiness. But under the right conditions, its benefits are clear. Armed forces should not assume that that joint staff, and the senior levels of leadership that it represents, has all the answers. Neither should they pin all their hopes on specially carved out innovation offices or transformational units, for these merely serve to create a monopoly in the creative endeavour. Where such entities exist, they must be put in direct competition with the services, where rich veins of creativity may lie untapped.

Adopting the prescriptions of interservice competition in some areas of the military would result in a radically different armed force. Indeed as the competitive pressures play out over time, it may turn out to be one that may look radically different from decade to decade. But given the rapid pace of change in the external environment, such change would perhaps be for the best. The danger is that most militaries would miss out on this should they adhere blindly and uncritically to the present credo of jointness. "With fewer dollars and more friction, the services will have to think harder about the threat and how the Armed Forces can meet it. There is no better incentive to candor, error correction, and creativity in defence planning than a tight budget and a few smart rivals competing for a share of the pie."[19]

Endnotes

1 For an account of this incident see Bill Owens (2000) p 154.

2 Due to the limits of open sources, the cases discussed here are drawn mainly from the American (and to a lesser extent the British) military. However the lessons are easily contextualised to become applicable to almost any modern armed force.

3 See C. Kenneth Allard's *Command, Control, and Common Defence* (New Haven: Yale University Press 1990), and Carl H Builder's *The Masks of War: American Military Styles in Strategy and Analysis* (Baltimore: Johns Hopkins University Press, 1989) for good accounts of the institutional personalities of the Services in the US Armed Forces.

4 Bill Owens (2000), pp. 7-8.

5 Bill Owens (2000) pp. 153-154.

6 For an account of the earliest attempts at jointness see Roman and Tarr (2002), pp. 93-97.

7 The best account of Goldwater-Nichols Act is found in Roman and Tarr (2002), pp. 100-108. As powerful a statement of jointness as the Act was, it did not contain an explicit definition of the very concept it sought to entrench. Jointness was defined by negation through the identification of interservice rivalry as an obstacle to it. The implication of course, was that interservice rivalry was a net negative that needed to be suppressed.

8 See Owens (2000) p 23 and pp. 205-206.

9 Sapolsky and Gholz (2000), p. 5.

10 Sapolsy and Gholz (2000), p. 6.

11 Palmer (1978) gives an excellent account of McNamara's policies.

12 Harold Brown (1983) p 209.

13 Sapolsky, Gholz and Kaufman (1999) p 83.

14 These conditions are from Sanford Weiner. Quoted in Sapolsky (1997) p. 52.

15 Builder (1994), p. 33.

16 Sapolsky (1972) provides the most comprehensive account of the factors that accounted for the success of the Polaris project.

17 Gholz and Sapolsky (2000) p. 7.

18 Van Tol (1997) p 83.

19 Sapolsky (1997), p. 53.

Bibliography

Brown, Harold, *Thinking About National Security* (Boulder, CO: Westview Press 1983).

Builder, Cark H., "Roles and Missions: Back to the Future", in *Joint Forces Quarterly*, Spring 1994, pp. 32-37.

Cropsey, Seth, "The Limits of Jointness", in *Joint Forces Quarterly* Summer 1993, pp. 72-79.

Dougherty, Kevin J. "The Evolution of Air Assault", in *Joint Forces Quarterly*, Summer 1999, pp. 51-58.

Hartley, Keith, "The Economics of Joint Forces" in Andrew Duman, M.L.R. Smith, and Matthew Uttley (eds.), *The Changing Face of Military Power: Joint Warfare in an Expeditionary Era* (New York: Palgrave MacMillan, 2002).

Fautua, David T., "The Paradox of Joint Culture", in *Joint Forces Quarterly*, Autumn 2000, pp. 81-86.

Owens, Bill and Ed Offley, *Lifting the Fog of War* (New York: Farrar, Straus, and Giroux, 2000).

Palmer, Gregory, *The McNamara Strategy: Programme budgeting in the Pentagon, 1960-1968* (Westport CT: Greenwood Press, 1978).

Roman, Peter J. and David W. Tarr, "The Joint Chiefs of Staff: From Service Parochialism to Jointess", *Political Science Quarterly*, Spring 1998.

Sapolsky, Harvey M. *The Polaris System Development: Bureaucratic and Programmatic Success in Government* (Cambridge MA: Harvard University Press, 1972).

Sapolsky, Harvey M, "Interservice Competion: The Solution, Not the Problem", *Joint Forces Quarterly*, Spring 1997, pp 50-53.

Sapolsky, Harvey M., Eugene Gholz and Allen Kaufman, "Security Lessons from the Cold War", *Foreign Affairs*, 1 Jul 1999, pp 77-90.

Sapolsky, Harvey M. and Eugene Gholz, "The Defence Monopoly" in ???

Van Tol, Jan M., "Military Innovation and Carrier Aviation the Relavant History" in *Joint Forces Quarterly* Summer 1997.

Van Tol, Jan M. "Military Innovation and Carrier Aviation An Analysis" in *Joint Forces Quarterly*, Autumn/Winter 1997-98.

MAJ Kwek Ju-Hon is a Navy combat officer and is currently a Branch Head in the Defence Policy Group. His previous appointments include serving as an Operations Officer onboard a Missile Corvette (MCV). He graduated from Oxford University in 1996 with First Class Honours in Philosophy, Politics and Economics and received a Masters degree in East Asian Studies from Yale University in 1997.

Countering the Friction and Fog of War in the Information Age

by MAJ (NS) Chia Eng Seng Aaron, PhD

"Everything in war is very simple, but the simplest thing is difficult."

Clausewitz[1]

The information age allows integrated forces to operate in a dispersed manner without sacrificing operational capability. A dispersed force complicates the enemy's targeting problems. It enables better responsiveness offered by improved Command, Control, Communications, Computer and Intelligence (C4I). It improves intelligence gathering and dissemination. Finally a common operating picture will allow each unit in the network to respond to each of the threats reducing the overall potential risk. It enables the dispersed force to attack the defender from a variety of angles complicating the defensive task. Thus, information age technologies have the potential to deliver a decisive advantage in all forms of combat including asymmetric warfare.

However, war in the information age is not without friction or fog. Every good officer needs to understand them and be able overcome them whenever possible, and not to expect a standard of achievement in his operations when the very friction makes it impossible.[2] This article explains the concepts of friction and fog of war and how they may manifest in this information age. It discusses the measures the SAF need to counter or at least minimise them. It stresses the need for an overhaul in our structures, processes, and mindset in order to exploit information technologies and transform ourselves to prepare for future war(s).

Friction and Fog in the Information Age

One of Clausewitz's most notable ideas about military art of war was the concept of friction.[3] He pointed out that a person who has not experienced war could not comprehend why the conduct of battle is so difficult.[4] "The difficulties accumulate and end by producing a kind of friction that is inconceivable unless one has experienced war."[5] The most unpredictable part of friction is people: the troops who fight and the commanders who command them. On the military machine, Clausewitz noted that none of its components is one piece: "each part is composed of individuals, every one of whom retains his potential for friction." His second meaning of fiction is the information theory sense of what we have recently come to call "noise" in the system. According to Clausewitz, plans and commands are signals that inevitably get garbled amid noise in the process of communicating them down and through the ranks even in peacetime. Although Clausewitz used fog four times, he never uses "fog of war." Twice, fog referred to a meteorological phenomenon that served as a type of friction.[6] In the third occurrence he referred to the unreliability of information in war. Clausewitz noted that "all action takes place, so to speak, in a kind of twilight, which, like fog or moonlight, often tends to makes things seem grotesque and larger than they really are."[7] In the last instance, he employed "fog" to describe war's ambiguities - "war is the realm of uncertainty; three quarters of the factors on which action is based are wrapped in a fog of greater or lesser uncertainty."[8] Thus, his famous metaphor of the "fog" of war implied how distortion and overload of information produce uncertainty to the actual state of affairs.

Friction is compounded by other factors and forces, including the environment of danger that characterizes war and the physical exertions required in battle. One of the most unpredictable elements is introduced by the relationship between friction and chance in war.[9] One example of friction related to chance is weather and its effects on the outcome of battle. In addition, Clausewitz noted, "We have identified danger, physical exertion, intelligence and friction as the elements of war that coalesce to form the atmosphere of war, and turn it into a medium that impedes activity. In their restrictive effects, they can be grouped into a single concept of friction."[10] It is difficult to differentiate between the effects due to fog and friction, for fog is in

fact part of friction. Fog is emphasized from the other forms of friction because many believe that information technologies can help to lift the fog of war.[11]

As mentioned earlier, the most unpredictable part of friction is people. This is manifested especially through the inability of different services to fight together (dis-jointness) and human frailties. The fog of war is revealed though battlespace shadows and intelligence failure. Finally, friction is multiplied in asymmetric warfare as evidenced by the difficulties in countering terrorism.

- ## "Dis-Jointness"

   The inability of two or more services to communicate directly with one another is a great source of friction that continues to undermine the military. Some soldiers are incapable of distinguishing between pride and blind loyalty to their specific military service. Rivalries become institutionalised due to interservice competition for budget and weapons ownership. For example, should the Army rather than the Air Force control the helicopters used in support of the troops?[12] People sometimes confuse professionalism with loyalty to a particular military service, or even a professional vocation within a service. The problem occurs when this relatively healthy expression of solidarity to a community hardens into an unreasoned, blind commitment to existing doctrine or structure. This erodes the effectiveness of joint operations.

   In the Gulf War, the battlefield was divided among service components. Lines were drawn on the maps that laid out the areas of responsibility. These were drawn not only because of service rivalry but also because of technology. The US Army could not communicate with the US Marines; the Marines had difficulty communicating with the US Air Force (USAF); and the USAF had problems communicating with the US Navy.[13] For example, the Navy was forced to fly a daily cargo mission from the Persian Gulf and the Red Sea to Riyadh in order to pick up a computer printout of the air mission tasking order, then flew back to the carriers, and distributed the document for planning the next air strike. The inability of Navy/Air Force communications systems during Operations Desert Storm severely complicated joint missions.[14] Worst still, friendly fire deaths in the vast majority of incidents in Desert Storm involved misperceptions and human error caused by the lack of proper data links and common operating procedures among the different services.[15]

   Differing services' requirements continue to plague the US in the Gulf War. The USAF wanted to attack strategic targets deep inside Iraq while the Army wanted the USAF to concentrate on hitting Iraqi Army units in the planned line of advance of the ground forces. "Air support-related issues continue to plague final preparations for offensive operations and raise doubts concerning our ability to effectively shaped the battlefield prior to initiation of the ground campaignArmy nominated targets are not being serviced."[16]

- ## Human Frailties

   Information technologies will not signal the end of the human in the loop and by extension human error in warfare. A common operating picture will not ensure that each person viewing the common picture will interpret it the same way or make a predictable or wise decision to capitalize on the information. In an "information-rich" environment, there is only so much that any human can absorb, digest, and act upon in a given period of time. Information overload is perhaps the most cited drawback. E-mail is already one of the office's most hated tyrannies. The greater the stress, the more data will be ignored, noise will be mistaken for information and information will be misconstrued, thus increasing the prospects for confusion and surprise. The spatial and temporal distribution of information relevant to decisions in war means that some key pieces will be inaccessible at any given time and place. The empirical fact of non-linear dynamics, when coupled with mismatches between reality and our representations of it, reveals limits to prediction, no matter how much information and processing power we have. Moreover, the constant flow of information could result in not reaching a decision or decisions being delayed as staff seek out every

obtainable detail. Staff and even commanders may become so immersed in managing the systems, providing inputs and assessing their outputs, that they forget to analyse the situation themselves.

- ## Battlespace Shadows

Many ancient and current strategists and military theorists such as Sun Tzu[17] and Napolean Bonaparte[18] have long written about the importance of knowing the battlefield and one's enemy. In the early days of organised warfare, the commander's ability to influence events was defined by the range of human eyesight. Technology has changed this. Better communications expanded the dimensions within which land, sea and air scouts could report "what they saw" beyond visual range. General Schwarzkopf, the Commander-in-Chief of Allied forces in Operation Desert Storm in 1991, was able to "see" what was occurring in an area of nearly 250,000 square miles with greater fidelity and accuracy than any other previous military commanders in any previous conflict.[19] Still, the vision is spotty, usually late and hardly clear. The technology and military systems used for battlefield surveillance did not cover the entire areas at all times and could not see through bad weather conditions or smoke clouds from the burning of oil fields. They were not able to detect mobile Iraqi Scud missile launchers.[20]

Combat occurs in the real world, not in the information domain. What sensors see may not be what is actually there. For example, despite impressive aerial surveillance and bombing, the Serbian Army in Kosovo withdrew with much of its combat power intact as a direct consequence of its effective concealment techniques.[21] Despite state of the art surveillance systems, and supposedly powerful intelligence, the US still managed to partially destroy the Chinese Embassy in Belgrade.[22] As long as there is a thinking opponent employing decoys, deception etc, no amount of sensor coverage will ever perfectly capture the true situation. Adversaries can acquire sophisticated commercial capabilities to attack information systems and sensors through physical attacks, hacking, jam-ming and deception. The widespread use of Global Positioning System (GPS) for military purposes also brings with it new vulnerabilities. These satellites are vulnerable to physical attacks, electromagnetic pulse, spoofing and low cost jamming. The "electronic flank" will continue to form part of the friction and fog in the information age.

- ## Intelligence Failure

Another problem in the Gulf War was information analysis and dissemination. The array of intelligence systems and tactical military sensors continuously generated great volumes of raw data about the Iraqi forces, their locations, activities and movements and communications. However, there were not enough people or equipment to process the raw data into meaningful depictions of the Iraqi capability and their movements. The system was also unable to disseminate intelligence reports below the division level.[23] The fog of war persists.

- ## Asymmetric Warfare

The US may be confident that its lead in information, electronics and communications technologies will allow her to prevail against plausible opponents in the next century. However, future opponents of the US will adopt asymmetrical strategies that rely, in part, on friction. While the US is talking on the synergistic nature of remote fires, precision engagement, battlefield awareness and information dominance, she will see the synergistic nature of terror, deceit, brutality and unpredictability. Friction was at work in the recent terrorist attack on the US World Trade Centre on 11 September 2001. With all her intelligence marvels, she was not able to envisage such an attack on her own soils and still has not located Osama Bin Laden.

Technological innovation introduces novelty in warfare, and the indirect effects are never predictable with any degree of certainty. Superior technology cannot avoid the inevitable confusions and frustrations of the battlefield. While technological advances might mitigate certain forms of friction,

they would neither eliminate nor substantially reduce its potential magnitude.[24] We must not be "blind to its harmful effects."[25] Although information technology can confer great advantages, by itself it cannot determine the outcome of war. There is no prescription for war for "there are in warfare no constant conditions."[26] As observed by Clausewitz: "Great part of the information obtained in war is contradiction, a still greater part is false and by far the greatest part is of doubtful character."[27] Although the information revolution appears to be able to supply military forces with new capabilities and "near-perfect" information, the friction and fog of war nevertheless will not vanish.

Countering the Friction and Fog of War

According to Clausewitz, friction can be countered by training, discipline, regulations, orders and "the iron will of the commander". He also specifies one lubricant to reduce the friction of war: "Only one, and a commander and his army will not always have it readily available: combat experience."[28] Unfortunately combat experience is hard to come by. Observation of war perhaps offers the next best lessons in the study of friction. In its absence, history offers the next best alternative as a storehouse of information about how people behave in war. History provides a window to study some of the real complexities commanders faced in difficult settings. Moreover, the study of military history enables us to assess different perspectives and understand situations better. Lessons from the Gulf War have taught us some of the friction and fog faced in war. We can then make better preparations for war.

Information technology alone will not provide the military with the combat power and strategic agility we will need in the wars and crises of the future. We need a "military process reengineering." It must transcend new weapons and information systems to include a thorough re-examination of basic size force structure, roles and missions of the services.[29] We need to focus on systems integration, the process by which we tie military technological applications into the organisations and force structures. One of the best examples of using new technology with innovative military organisation tactics was Nazi Germany's use of blitzkrieg,[30] which combined the use of close air support, radio communications, and German tank divisions specifically designed to outrace and outgun the enemy.

Joint war fighting brings combat capabilities of the services together resulting in a whole that is greater than the sum of the parts. Therefore we must scrutinise research and procurement of weapon systems at joint level, not individual services level and improve our joint war fighting capabilities. Several areas of focus are: joint, versatile and flexible structures; joint command, control, communications, computers, intelligence, surveillance, and reconnaissance (C4ISR); joint manpower considerations; and joint experimentation. From the technology angle, we need to continuously insert new technologies and take advantage of the "revolution in logistics affairs".

- ## Joint, Versatile and Flexible Structures

  We need to critically look at our force structure and the roles and missions of our services. Can we have a force structure without the services, but one based on missions? Is the present system of divisions, brigades and battalions modelled after the Napoleonic Grande Armée still valid? New forms of structures are required especially one based on modular combat groups. We need versatility and flexibility to achieve operational success. We must be able to fight a conventional warfare as well as an asymmetric one. Similarly defence science and technological agencies need to be structured accordingly.

  War is complex. Complexity theory suggests that the most effective way of managing highly interrelated and dynamic problems is by the decentralisation of decision-making and action to close to the source of complexity.[31] Decentralisation relies on initiative, the acceptance of responsibility and mutual trust. This is similar to the British's mission command which is fundamentally a decentralized style of command whose key elements are "timely decision making, the importance of understanding the superior commander's intention and applying this to one's own actions, and a clear responsibility to fulfil that intention."[32] The US concept of self-synchronisation, an essential

element of Network Centric Warfare, envisages commanders and individuals armed with the commander's intent to do what needs to be done without traditional orders.[33]

- ## C4ISR

Service commanders need to grasp the implications of the new information technologies that make it possible to operate together in a synergistic manner where it was difficult or almost impossible earlier on. Attrition warfare[34] and platform centric warfare[35] may no longer be optimal. Manoeuvre warfare[36] or mission based warfare aided by innovative military structures and new sensor, weapon and communication technologies may be more appropriate. In a mission based environment, the primary consideration becomes acquiring platforms that can be networked with other systems and sensors based on the mission. Some writers would term this as Network Centric Warfare. By being part of the network, the platform is able to obtain information and capabilities the stand-alone platform cannot.

We need to provide for information accessibility, commonality and velocity. The information needs to be precise to enable the accurate application of force. The more we rely on information resources and systems, the greater must be our efforts to protect them. We need to employ safeguards against attacks upon our critical information networks and in detecting, combating, and recovering from cyber attacks as soon as they are attempted. Commanders and soldiers need to be trained and developed to operate in an information rich environment.

- ## Joint Manpower Considerations

The term "interoperability" is often used only in the context of physical interoperability between equipment and systems. However,

shared understanding can only be provided by cognitive and doctrinal interoperability.[37]This implies a depth of common military education and training to produce officers of quality who approach problems in the same way it does not imply a lack of originality or flexibility of mind, but rather a confidence and mutual understanding based on shared military values and education. This is critical in understanding the "commander's intent".[38] We need to consolidate education and training into a single entity that can articulate a common vision. We need to recruit enlisted personnel and cadets to the military as a whole instead of just their own service. The military schools would be located together as a single organisation. We need to locate the services together, train them full-time together and deploy them as a single entity.

Most militaries have a methodology for decision-making that has been described as traditional, theoretical, and predominantly prescriptive, i.e., your standard operating procedures. The standard method for making decisions is to decide on an aim, consider all the relevant options, define all the important evaluation criteria, weigh the importance of each criterion, evaluate each option on each criterion and select the winner, otherwise know as "Rational Choice Strategies"[39] or RCS. There is strong evidence that most decision makers do not use RCS. Most uses Naturalistic Decision Making (NDM), which addresses how people actually make decisions in natural or realistic situations.[40,41] These methods apply to ill-structured problems in uncertain, dynamic environments where high stakes and time pressures are norms and are thus highly appropriate to many tactical situations. We need to change the way we think and make decisions. We also need to learn and explore ideas from nature, science fiction and even fantasy novels. They are a rich source of inspiration.

- ## Joint Experimentation

Meaningful improvements in all areas of joint war fighting will require a willingness to question current practices, organizational patterns, and command processes in essence, continued progress

toward significant cultural change. Unless a significant level of disruptive experimentation takes place, the coherent development of capabilities to enable transformation will not occur. Experimentation is designed to evaluate new missions, devise new force structure, and test new operational concepts. It allows us to integrate the experimental concepts and new weapon systems being developed by the services into a joint framework early in the development process. Modelling and simulations will attain new significance. Some disruptive experimentation that appears to be of no training value will be required to enable us to envisage new ways of doing things.

- ## Continuous Insertion of New Technologies

The exceedingly rapid pace of technological advancement in the latter half of the 20[th]century has rendered traditional military systems development, acquisition and lifecycle support strategies impractical. Technologies are often sadly out of date by the time the first unit is equipped. In recent years, this problem has become especially severe within the electronics community. Advances in technology, system proliferation, spectrum re-use technologies and spectrum management concerns have all figured heavily in creating an environment in which legacy equipment can no longer function in an efficient manner. New development techniques are needed in order to mitigate these problems. Faster, more streamlined design is necessary to support the needs of the modern military. The pace of technology advancement dictates that systems be designed to maximize the transparent insertion of new technologies at virtually every phase of their life cycle from procurement through fielding and operational use, to protect them from premature obsolescence.

- ## Revolution in Logistics Affairs

Information age technologies, particularly in the fields of asset tracking and remote diagnostics, revolutionise logistics so much that some people are calling it the "Revolution in Logistics Affairs". Logistics should become more focused towards actual requirements, rather than over insurance. This will allow reduced logistics drag and a smaller logistics footprint, while increasing flexibility and the ability to sustain expeditionary operations. Full platform systems integration allows for self-demand whereby platforms automatically request re-supply and anticipate repair. The reduction of stocks in the area of operations also means a reduction of personnel required. This also means that a big part of logistics can be contracted out, saving military personnel for combat posts as well as providing economic activity during peacetime and employing civilians during wartime.

Conclusion

In its Joint Vision 2020, the US recognized the role of friction in war: [42]

"friction is inherent in military operations. The joint force of 2020 will seek to create a "frictional imbalance" in its favor by using capabilities envisioned in this document, but the fundamental sources of friction cannot be eliminated. We will win but we should not expect wars in the future to be easy or bloodless."

Friction and fog will continue to be central to future warfare regardless of technological changes in the means of combat. They are difficult to overcome especially in asymmetric warfare, but we must work hard to reduce their occurrences as much as possible.

Technological change alone cannot counter the friction and fog of war and does not lead to transformation intellectual change is also necessary. We need to foster a mindset that allows us to take advantage of both new ideas and new technologies. It will involve the controversial and difficult effort of integrating innovative military technological applications and organising new ways of conducting warfare into a realigned military force structure. Identifying specific organisational reforms will be difficult and every change will challenge and threaten a host of entrenched military traditions and bureaucratic interests. There will be resistance and opposition. However, not to exploit information technologies for war would be foolhardy.

A blueprint for change will require the following considerations[43]: First, we need to define our threats and work out a overarching set of capabilities we believe our forces must possess to support war now and in the future. Second, we need to use those capabilities to guide the development of joint operational concepts and architectures that drive decisions concerning materiel and non-materiel improvements and to establish standards for interoperability. Joint experimentation and process reengineering are good approaches. Third, we must integrate requirements for new doctrine, organizations, training and education, leadership, personnel, and facilities into the process. Finally, we need to find ways to modernize and integrate legacy systems when needed, while developing technological bridges with interagency and international partners.

Endnotes:

1. Carl Von Clausewitz, *On War*, eds. Michael Howard and Peter Paret, Princeton University Press, Princeton, New Jersey, 1976, p. 138.

2. Clausewitz, p. 140.

3. Stephen J. Cimbala, *Clausewitz and Chaos: Friction in War and Military Policy,* Praeger Publishers, Westport, Connecticut, 2001.

4. Clausewitz, p. 140.

5. Clausewitz, p. 119.

6. Clausewitz, p. 120 and 143.

7. Clausewitz, p. 140.

8. Clausewitz, p. 101.

9. Colin S. Gray, *Modern Strategy*, Oxford University Press, Oxford, 1999, p. 41.

10. Clausewitz, p. 114.

11. Admiral Owens argued that it is possible to lift the fog of war through the Revolution of Military Affairs. For such an argument, see Owens, *Lifting the Fog of War*, John Hopkins University Press, 2000.

12. The answer is at Joint level. Although many of the scarce war resources are already being decided at Joint level, the rivalry remains. We are still working more at Service level than a truly integrated Joint level.

13. Owens, p. 92.

14. Owens, p. 64.

15. Owens, p. 155.

16. Memorandum from BG Steve Arnold, cited in Rick Atkinson, "Crusade The Untold Story of the Persian Gulf War," Boston and New York: Houghton Mifflin, 1993, p. 339.

17. "One who knows the enemy and knows himself will not be endangered in a hundred engagements. One who does not know the enemy but knows himself will sometimes be victorious, sometimes meet with defeat. One who knows neither the enemy nor himself will invariably be defeated in every engagement." From Sun Tzu, *The Art of War*, trans. Ralph D. Sawyer, Boulder: Westview Press, 1994, p. 135.

18. A general never knows anything with certainty, never sees his enemy clearly and never knows positively where his is.... The general never knows the field of battle on which he may operatehe has no positive information; data to reach a knowledge of localities are so contingent on events that almost nothing is learned by experience. From *The Military Maxims of Napoleon*, in "Roots of Strategy," eds. Wilhelm Defense Leeb and Thomas R. Philips, Stackpole, Books, 1985, p. 440-41.

19. Owens, p. 13.

20. Owens, p. 13-14.

21. David Potts, "The Delilah Factor New Threats and Vulnerabilities", in *The Big Issue: Command and Combat in the Information Age*, David Potts, eds, UK Strategic and Combat Studies Institute, Mar 2002, p. 98.

22. Ibid.

23. Robert H. Scales, *Certain Victory: The U.S. Army in the Gulf War*, Office of the Chief of Staff, United States Army, 1993, p. 371-72.

24. Bary Watts, *Clausewitzian Friction and Future War*, McNair Paper 52, National Defense University Press, Washington D.C., 1996, p. 124.

25. MAJ Milton Ong Ann Kiat, "Cautions and Cautiousness in Harnessing Technology for Army 21." *Pointer*, Vol. 27, No. 3, Jul-Sep 2001, p. 93-102.

26. Sun Tzu, p. 113.

27. Clausewitz, p. 162.

28. Clausewitz, p. 141.

29. Michael Vlahos, "The War After Byte City", in *The Information Revolution and National Security*, ed., by Stuart J. D. Schwatzstein, Washington, D.C., The Center for Strategic and International Studies, p. 88.

30. Although formed by two German words, blitz and krieg, for "lightning" and "war" respectively, it is not a German word. It was supposedly coined by a British newspaper editor in 1940. See Brassey's Encyclopedia of Military History and Biography, Washington D. C. and London, 1994, p. 161.

31. Tom Czerwinski, "Coping with the Bounds", in *Speculations on Non Linearity in Military Affairs*, Institute for National Strategy Studies, Washington, 1988, p 79-95.

32. British's Army Doctrine Publication (ADP) Volume 2, *Command*, Army Code 71564, Apr 1995, Paragraph 0210.

33. Jim Storr, "A Command Philosophy for the Information Age: The Continuing Relevance of Mission Command"in *The Big Issue: Command and Combat in the Information Age*, David Potts, eds, UK Strategic and Combat Studies Institute, Mar 2002, p. 98.

34. Attrition warfare focuses on grinding down the enemy though superior resources and numbers. Attrition warfare achieves victory eroding their strength with superior mass and killing power and annihilating them through complete destruction and occupation.

35. Platform centric warfare places an emphasis on the platform or weapons system as the focal point of combat. Platforms inflict physical damage upon an enemy. The ability of this combat power forms the basis for military organization, doctrine, tactics, techniques and procedures.

36. Manoeuvre warfare is the employment of forces on the battlefield through movement in combination with fire to achieve a position of advantage in respect to the enemy in order to accomplish the mission. Its primary goal is to generate systemic disruption and create enemy friction through rapid violent attacks against key centers of gravity. While force is important, it is the concentration of that force in space and time that is most critical. Consequently, manoeuvr is measured in terms of speed and surprise, not firepower alone.

37. Similar concepts are espoused by the US as "co-operability", UK as "interoperability of the mind", Germany as "einheit im denken" or "unity in thought."

38. This will be discussed in more detail in the next paragraph.

39. Kallimeier, et al, "Towards Better Knowledge: a Fusion of Information, Technology and Human Aspects off Command and Control," *Journal of Battlespace Technology,* Vol. IV, No. 1, Mar 2001, p. 34-43.

40. Raphael Pascual and Simon Henderson, "Evidence of Naturalistic Decision Making in Command and Control", in*Naturalistic Decision Making*, Caroline E Zsambok and Gary Klein ed, Lawrence Erlbaum, Associates, New Jersey, 1997, p. 217-266.

41. Gary Klein, *Sources of Power: How People Make Decisions*, MIT Press, London, 1998, p. 38-29.

42. Director for Strategic Plans and Policy, J5; Strategy Division, "Joint Vision 2020," US Government Printing Office, Washington DC, June 2000.

43. Several of these considerations are obtained from: Posture Statement of General Richard B. Myers, USAF, Chairman of the Joint Chiefs of Staff before the 107th Congress Senate Appropriations Committee (Subcommittee on Defense), 21 May 2002.

MAJ (NS) Chia Eng Seng Aaron, PhD, is presently working in the Defence Science and Technology Agency. He was an Air Operations and Communications Officer and Air Engineering Officer by training and had served in Air Plans Department, Air Intelligence Department, Air Logistics Department and DSO National Laboratories. MAJ Chia has a PhD in electrical engineering and a Masters in Business Administration (Management of Technology). He won a Commendation Award in 2001.

Will China Attack Taiwan

by CPT Fan Sui Siong, Kelvin

Tensions across the Taiwan Straits have intensified in recent years in the wake of increasingly strong signals from Taiwan that it may soon declare independence. These signals, coupled with mainland China's increasingly aggressive stance led many military and political commentators to speculate that the People's Republic of China (PRC) will solve the "Taiwan" issue once and for all by regaining Taiwan with military force. However, this view fails to take into account the existing gaps in PRC's military capabilities as well as political pressures which would render a force-driven takeover of Taiwan implausible in the near future.

Any war between mainland China and Taiwan would be de-stabilising to Singapore and the whole Asia-Pacific region. Firstly, China and Taiwan are two of the most important trading partners for Singapore. The destruction of trade links in the face of war would be economically devastating in a region already economically fragile after the 1998 currency crisis and the post 9/11 economic slowdown. Secondly, a successful Chinese conquest of Taiwan could radically alter the balance of power in the region. With her size, technological expertise and wealth (the latter two partially acquired from Taiwan) China would be firmly established as the regional hegemon in place of Japan and its policies, defence, economic or foreign, would have a direct impact on Singapore. Thirdly, any war between the mainland and Taiwan could involve a nuclear element. Given Singapore's geographical proximity to the Taiwanese Straits, the repercussions could be devastating.

Will war occur? The China-Taiwan military balance has been extensively covered in many excellent studies. However, most of these articles focus on current military capabilities, while neglecting the dynamic aspect of military procurement as well as the political will dimension. While this essay argues that PRC is unlikely to attack Taiwan in the near future, a war is still plausible if political circumstances favour PRC and when PRC has fully acquired the military capabilities for invasion. In light of the impact a PRC-ROC conflict could bring to Singapore, it is important for Singapore tounderstand the Straits stand-off in the right military and political context. For brevity, one important aspect of this potential stand-off was neglected in the analysis that of the possible nuclear conflict which could erupt. A nuclear conflict is unlikely for two reasons. Firstly, Taiwan would be destroyed in a nuclear attack and would be utterly useless to China, even if she were to be returned. Secondly, the use of nuclear weapons would destroy all that China has worked for in building its international reputation and integrating itself into the economic and diplomatic communities.

Recent Trends

Until the lifting of martial rule in Taiwan in 1988, the Republic of China (Taiwan or ROC) has been ruled by one single party, the Kuomintang (KMT). The KMT retreated to the Taiwanese islands after losing the civil war in mainland China to the Communist Party in 1949 and had always declared its wish for re-unification with the mainland, albeit on its own terms. However, since 1988, the pro-democracy movement and popular support for official independence in Taiwan have intensified, sending strong signals to PRC leaders that the Taiwanese may soon declare de facto independence from PRC to be official. Several key events have reinforced this view. In a watershed speech given at his alma mater Cornell University in 1995, then President Lee Teng Hui, announced his deviation from the "one China" policy by declaring that the Republic of China on Taiwan (ROCOT, which includes the Taiwan Penghu islands, including Jinmen and Mazu) to be a separate and independent sovereignty deserving recognition by the international community. President Lee then initiated "state-to-state" talks with PRC in 1999. In 2000, despite strong threats from PRC, the Taiwanese people elected the leader of the pro-independence opposition Democratic Progressive Party, Chen Shui-bian as President. The DPP has since increased its strength in the Taiwanese Parliament. More recently in 2002, President Chen made what later was said to be "off the cuff" remarks about holding a referendum to decide on Taiwan's independence while Vice-President Annette Lu conducted "vacation diplomacy" in Indonesia, a move perceived by PRC leaders to be part of the current administration's efforts to assert its distinct identity.[1]

On the other hand, in the wake of rising economic power, China has increasingly been more aggressive in pressing its case for Taiwan's return to Chinese rule. Prior to Lee Teng Hui's visit to the United States in 1995, China conducted naval exercises and missile tests in the Taiwan Straits in a bid to coerce President Lee into abandoning the high-profile visit. In March 2000, following the election of President Chen Shui-bian, the State Council of PRC released a white paper warning Taiwan that it will not wait for re-unification indefinitely. Instead, it urged President Chen to renounce his Democratic Progressive Party's stance on independence and explicitly affirm the "one China" principle, while reminding the international community that it reserves the right to use force against Taiwan to "safeguard its own sovereignty and territorial integrity."[2]

Recent events thus show the two sides to be escalating towards conflict, with both sides setting redoubtable conditions before cross-straits dialogue to resolve the differences could resume. While Beijing insists that Taiwan must accept the "one China" principle, Taipei has countered by demanding that Beijing first denounce the use of force.[3] This deadlock coupled with recent weapon acquisitions by both sides could thus lead popular opinion to imagine that war between the two sides is likely and imminent.

China's Military Policy/Doctrine

To analyse the various strategies that China could undertake in dealing with the Taiwan issue, a brief understanding of the development of Chinese defence policy or military doctrine would be useful. During the Cold War, when the threat was a massive land invasion from the USSR, Chinese defence policy was based on the concept of the Maoist concept of "People's War", under which quantity was often emphasised over quality. In the 1990s, with other armies around the world developing more and more technologically sophisticated capabilities, a new military doctrine known as "Limited Wars under Modern conditions" had been adopted in a bid to turn the People's Liberation Army(PLA) into an army capable of responding swiftly to military incursions on or just beyond its borders. The world military, especially that of the West, now seems to be moving into a new era with the so called Revolution in Military Affairs(RMA). It is not surprising then that China is becoming more and more aware that rather than trying to match conventional military capabilities of the US and others, China could leverage on asymmetric warfare capabilities to counter or negate an adversary's superiorities. This use of unconventional approaches such as accurate ballistic missiles, information warfare and so on is particularly important because of its potential to deal with technologically superior forces that may come to Taiwan's aid in the event of war.

China's Military Options

Military commentators such as James Nolt, Thomas Bickford, Bates Gill, and Michael O'Hanlon all seem to arrive at the same conclusion in their studies: China may be a nuclear power but Chinese conventional military capabilities are limited and will remain so for many years to come. In analysing scenarios that have not happened yet, we can base our analyses on known facts, which is difficult given China's extensive secrecy policy,[4] as well as on intentions which are conditioned within the political context. In this section, we identify two broad military options that could be used against Taiwan:

- ### Coercion

  China's 2.47 million regulars[5] and her ever-increasing defence budget[6](which rose 17.6% to US$20 billion in 2002) give a first glance impression that China's military is a formidable force. How effective, then, is China's military in effecting a "Genghis Khan" strategy of submission through fear?

  First, we consider an air/missile attack. Intelligence reports reveal that China has about 200 short-range missiles along the Taiwan Straits, and the number may triple within five years. The M-9 and M-11 missiles are capable of hitting Taiwan but do not possess the accuracy to consistently hit high-value assets such as airfields, ports, or merchant ships. But what if China decides to direct the missiles towards civilian populations? Past experiences such as Iraq's scud missile attacks against Israel show that civilian casualties from missile attacks would be minimal but will the Taiwanese' will

to fight dissolve under this kind of terror tactic? Looking at Taiwan's response to the saber-rattling incident of 1996 where China fired missiles into the waters near Taiwan and conducted a simulated amphibious invasion, it seems that Taiwan's resolve will not be so easily broken; instead, it may just serve to embitter and harden the Taiwanese determination.

Next, we consider the idea of a blockade. A good coercive measure would be one that influences policymakers by affecting the welfare of the public. Presently, the Taiwan population enjoys a high standard of living due largely to its strong economy. Rather than threatening civilian lives, a blockade would extract an expensive economic price from Taiwan by cutting off commerce. A water-tight blockade would be beyond China's abilities but all China has to do is to introduce a significant risk factor into all maritime commerce activities to create enough fear to disrupt commerce activities. As Michael O'Hanlon (2000) points out, there are three facts which point to the success of this strategy. First, Taiwan has a small coastline, thus ships have predictable routes, allowing China to focus her limited mines and submarines. Second, Taiwan has limited natural resources, and her foreign trade accounts for two-thirds of her GDP, thus a naval blockade would be economically crippling. Third, Taiwan has only four submarines, 36 major surface combatants and about 100 smaller surface combat ships compared to China's 60 submarines, 50 large surface combatants and hundreds of smaller ships.[7] Taiwan may thus find itself outmatched and unable to break out of the blockade without external intervention.[8]

Despite the attractiveness of the coercion option, two factors would act as chief deterrents for China. Firstly, launching missile attacks or enforcing a blockade would be seen as acts of a tyrant nation, bent on destroying the Taiwanese, whom the Chinese government proclaim to be their own people. The diplomatic outcry provoked from the international community would be detrimental to China's reputation at a time she is trying to establish herself as an enlightened, modern world power. Secondly, the success of these strategies depends on Taiwan remaining isolated, without external allies to help break the blockade. However, the US, though ambiguously wording its stance on the "Taiwan issue", will clearly not be a neutral party in any conflict. The 1979 Taiwan Relations Act stipulates that the US would view any conflict with Taiwan with "grave concern".[9] This "grave concern" led the US to send aircraft carriers to the Taiwan Straits on two occasions during the 1995-96 Taiwan Strait crisis when China conducted military exercises and launched missile near Taiwan.[10]The US policy is thus one of unofficial protection of Taiwan whilst maintaining its "one China" official policy.

Therefore, while China has viable military strategies to coerce Taiwan into accepting Chinese mainland rule, she is unlikely to pursue these strategic options given its wish to remain an active member of the international community and the desire to avoid a military conflict with the US.

- ## Full Scale Invasion

Political Considerations

It is difficult for China to deploy any military option without provoking diplomatic isolation and a military response from the US. One way to minimise the adverse impact of these responses would be to launch a surprise invasion on Taiwan. Since deterrence is less costly than an all-out war to reclaim conquered territory, once Taiwan is successfully conquered, China would find it easier to reconcile the great powers within the international community,[11] especially the UN Security Council, to the new status quo. If one adopts the "realist" view of the world order existing in a state of anarchy, one would be inclined to think that states would primarily be interested only in their own survival and their own self interests. Thus, while any of Taiwan's allies, official or otherwise, may verbally condemn any force China uses on Taiwan, they may not necessarily intervene unless it is in their self-interest to do so. Self-interest the need to protect the sources of oil and prevent a monopoly in oil sales which could hold Western economies in ransom drove the UN Security Council to launch the Gulf War against Iraq to reclaim Kuwait in 1991. However, the Security Council did little to win back the Palestine land (including the Gaza Strip) conquered by Israel during the Arab-

Israeli War of 1967 as strategic or economic gains were not large enough to justify war. In the case of Taiwan, the key question lies in net benefits Taiwan could offer as an independent entity as opposed to being a mere province of China. Is Taiwan worth fighting for? Economically, independent Taiwan currently offer two advantages. The first is freer trade as compared to its mainland counterpart. However, given China's entry into the WTO, this gap is closing fast. The second advantage is the large contribution Taiwan makes towards economic aid and relief to developing countries which would be absorbed into the developing regions of China if Taiwan is incorporated into the mainland. Politically and strategically, an independent Taiwan protecting the Taiwanese Straits would act as a useful check against any ambitions of territorial expansion China may harbour in the region and would also protect the east-west shipping lines.

Weighed against these advantages are the drawbacks of opposing or going to war with China. Firstly, the costs of war would be high. Although China has limited military capabilities[12] and obsolete equipment, she still has one of the largest standing armies in the world (1.8 million soldiers) and a substantial submarine fleet which would be costly to take out. Moreover, coercion using weapons of mass destruction is likely to fail, as China herself is a nuclear power. Secondly, states opposing China risk losing trade ties and business links with the largest expanding economy in the world. Stacked alongside, the costs for the world powers far outweigh the benefits of fighting to regain Taiwan once China has conquered it by force. The US is an exception to this analysis. As mentioned earlier in the essay, American ambiguity on the Taiwan issue has made it difficult to predict what the American administration would do if China were to invade Taiwan. The US, as the only superpower left in the world, has to balance its instinct for self-interest (which prompted the switch to the recognition of PRC against ROC and the "One China" policy in 1970 under Nixon) against its diplomatic obligations towards traditional allies (which gave rise to the 1979 Taiwan Relations Act). However, given the US's recent focus on "rogue" states Iraq, Iran and North Korea, it might be difficult for the US to divert resources to fight yet another war to reclaim Taiwan, a move which would go against its "one China" policy anyway. China could therefore make a calculated guess that the US would not intervene with full scale military force if she should invade Taiwan.

Hence, on the diplomatic front, the best option for China is to launch a surprise all-out invasion of Taiwan. The key question is therefore *"Can China achieve a successful surprise full-scale invasion of Taiwan?"* The answer, fortunately, is no. The US Department of Defense predicts that even absent third party intervention, China's current military capabilities cannot support such an operation and would continue to fall short of requirements until 2005 at least.[13] Gill and O'Hanlon (1999) however, found this forecast to be too optimistic. Instead, they predict that it would be at least 20 years before China can pose such a threat.

Military Drawbacks

Islands have a natural defence barrier because of the difficulty of securing beachheads when the shores are well defended. The British Isles, for instance, have not been successfully invaded since 1066. By virtue of the 80 mile Taiwan Strait between mainland China and Taiwan, Taiwan is accorded similar protection from mainland China's large army. However, successful landings have been staged in recent years, with the Normandy landing on D-day being the most prominent example to date. According to O'Hanlon(2000),[14] three key elements are necessary for a successful amphibious assault (i) air superiority, (ii) initial superiority in troops/firepower at point of attack, and (iii) reinforcement advantage at point of attack. To add to this list, a successful assault will require (iv)well-trained, well-equipped troops who are properly coordinated in the battlefield. However, to quote the Pentagon, "China probably has never conducted a large scale amphibious exercise which has been fully coordinated with air support and airborne operations."[15]

Air Superiority

To invade Taiwan, China would first have to win control of the air before she could begin transporting its troops and equipment across the Straits without overly strong resistance. Air superiority can be gained with a well-coordinated surprise attack on Taiwanese key assets such as airfields, C2 facilities, and aircraft. This could be done by simultaneously launching China's 200 ballistic missiles and her 800-1000 attack aircraft to target Taiwan's key assets. However, both options face limitations. As argued, Chinese ballistic missiles, already limited in number, are also known to be inaccurate. The option of using attack aircraft to weaken Taiwanese resistance fares no better. Firstly, mobilising so many aircraft to bases near Taiwan could alert Washington and Taipei to an imminent attack, thus negating the surprise element. Secondly, her aircraft are unlikely to attack effectively and efficiently. Taiwan possesses three times as many 4th generation fighters as China.[16]Chinese aircraft are mostly obsolete and slow, travel at barely supersonic speeds[17] and lack radar, thus limiting their ability to attack at night and rendering them vulnerable to beyond visual range attacks from radar-guided missiles of Taiwanese modern fighters. Thirdly, according to O'Hanlon, even with a well-coordinated first strike by China, at least half of Taiwan's combat aircraft would survive and be used to frustrate China's amphibious assault.

Initial Superiority in Troops/Firepower at Point of Attack

To achieve this key element, China must be able to move large amounts of men and equipment quickly. However, it is limited to 70 ships which can only transport 10,000 15,000 troops, and her Il-67 transport planes which can move 6,000 more.[18] Even with an optimistically successful pre-emptive air campaign, China's amphibious force would have to deal with precision guided munitions from Taiwan's shore batteries and attacks from surviving airplanes and ships. Shallow water mines which Iraq employed to great effect during the Gulf War, could be laid along the Straits to frustrate Chinese attempts at landing. Furthermore, Taiwan has 236,700 active regulars and 1.5 million more ground force reservists,[19] giving her troop superiority over China's maximum landing force at any point along Taiwan's coastline, even if her troops are evenly spread out.

Reinforcement Advantage at Point of Attack

Even if we assume that China manages to successfully establish a beachhead, she would not be able to prevent Taiwan from deploying large reinforcements to the point of attack. Given that China is attacking from the sea, China's limited and inaccurate naval gunfire will be unable to prevent Taiwan from sending reinforcements to the point of attack. Also, the Chinese air force has limited capability of finding mobile and ground targets and thus would be unable to slow Taiwan's reinforcements. As such, Taiwan could conceivably be able to accumulate a force of over 100,000 troops at the point of attack within 48 hours.[20]

On the other hand, China herself would be unable to reinforce her position on the beachhead quickly with her small amphibious fleet. China would take at least 48 hours, contingent on good weather, to make a round trip to fetch reinforcements, within which Taiwan would have successfully marshalled her troops to the battlefield. Accounting for attrition, China could hope to add at most 5,000 troops to the point of attack per day. China could not hope to win with her 20,000 ill-trained and poorly-equipped Chinese troops against a numerically superior Taiwanese force of 100,000.

Training, Leadership, and Co-ordination

A full scale amphibious assault by China would be further frustrated by the poor quality of her troops, her lack of good leadership on the officer and NCO level, as well as command, control, computers and intelligence (C4I) deficiencies.

A recent report from the Pentagon provides a good gauge of the poor quality of Chinese troops and their leadership. While acknowledging that Chinese troops are generally patriotic, fit and good at basic infantry fighting skills, the report also suggested that "Ground force leadership, training in

combined operations and morale are poor. The PLA is still a party army with nepotism and political/family connections continuing to pre- dominate in officer appointment and advancement. The soldiers, for the most part, are semi-literate rural peasants; there is no professional NCO corps *per se*. Military service, with its low remuneration and family disruption is increasingly seen as a poor alternative to work in the private sector."[21]

Chinese capabilities are limited to the orchestration of only a few hundred air sorties a day,[22] a direct consequence of China's poor C4I. To quote the Pentagon again, "China's C4I infrastructure cannot support large-scale, joint force projection operations at any significant distance from the country's borders."

We thus see that China currently possesses none of these four key elements necessary to conduct an amphibious assault on Taiwan.

Conclusion

Despite predictions that China would attack Taiwan to assert its sovereignty in the face of strong Taiwanese grass-roots support for independence, this analysis shows that it is unlikely to occur in the near future. China has two broad military options: firstly, it could coerce Taiwan's capitulation by threatening missile attacks and/or through a blockade; secondly, China could launch a full-scale surprise invasion of the Taiwanese isles.

Coercion, while militarily feasible, could be politically and diplomatically disastrous, particularly since China is trying to integrate herself into the global world order. Moreover, coercion will succeed only in the absence of any third-party intervention. If one believes in the realist theory of global anarchy which states that states are governed by self-interest , China will find it easier if she could successfully invade Taiwan first and reconcile world opinion to it later. However, a successful surprise amphibious assault requires four integrated elements air superiority, initial advantage in troops/ firepower at point of attack, reinforcement advantage at point of attack and well-trained troops, supported by knowledgeable officers, NCO corps and sophisticated C4I capabilities. China does not possess any of these four elements as yet, hence the chances of success in an amphibious assault are small and the likelihood low in the near future.

With the take-over of Taiwan being either militarily unfeasible or politically/diplomatically damaging, it therefore seems unlikely, barring any major changes (such as a shift in geopolitical order or Taiwan declaring independence), that China would attack Taiwan in the near future.

Endnotes

1 Raymond Wu, "Watch words but seek cross-straits talks", *The Straits Times*, 13 September 2002.

2 Information office of the State Council of the People's Republic of China, "the One China Principle and the Taiwan Issue," Beijing March 2000, http://chinadaily.com.cn.net/highlights/taiwan/ whitepaper.html; Information office of the State Council of the People's Republic of China, "China's National Defence," Beijing, July 1998; and John Promfret, "Beijing stresses 'One China' to Taiwan," *Washington Post*, April 28, 2000, pp. 24.

3 Raymond Wu(2002).

4 US's "Annual Report on the Military Power of the PRC" identifies gaps in US knowledge about Chinese military power.

5 Figure taken from Anthony H Cordesman (Feb 2000), "The Conventional Military Balance in China and Northeast Asia".

6 This is her official military budget. Her actual spending could be much more than the stated amount.

7 Bates Gill and Michael O'Hanlon(1999), "China's Hollow Military".

8 Refer to Michael O'Hanlon(2000), "Can China Conquer Taiwan" for a detailed exposition to Taiwan's response to a naval blockade.

9 Henry Harding (1992), *A Fragile Relationship: The United States and China since 1972*, Washington D.C., Brookings Institution

10 First crisis occurred in 1995, when China tried to prevent the Taiwanese President Lee Teng Hui from visiting his alma mater, Cornell University. The second crisis occurred when China fired missiles to frighten Taiwanese voters away from the pro-independence Democratic Progressive Party during the 1996 presidential elections.

11 The definition of "great powers" here follows that of John Mearsheimer,

12 For a detailed exposition of China's weaknesses in military capabilities, see James Nolt's "The China-Taiwan Military Balance" (January 7, 2000) in *Across the Taiwan Strait: Exchanges, Conflicts and Negotiations* (eds, Winston L. Yang and Deborah A. Brown) and Bates Gill and Michael O'Hanlon's "China's Hollow Military" (1999),*National Interest*, no. 56.

13 Richard Fischer (2000), "Taiwan needs US arms," Asian Wall Street Journal

14 O'Hanlon gained his insight from conducting extensive research on recorded attempts at amphibious assaults 4 historical successes, 3 failures, and 2 potential attacks in the future. See "Can China Conquer Taiwan"(July 2000), International Security Vol 25 No.2, for more details.

15 William Cohen, "Future Military Capabilities and Strategy of the People's Republic of China."(1999) P. 15.

16 Pentagon (2002), "Annual Report on The Military Power of the PRC", Report to Congress.

17 See Nolt (2000) for full details of Chinese ageing and obsolete airforce.

18 Damon Bristow (June 2000), "The Military Balance Across the Taiwan Strait Does China have the Edge?", Mainland Affairs Council and Graduate of Political Science, NSYSU.

19 Figures from O'Hanlon (2000) and Cordesman (2000).

20 O'Hanlon(2000).

21 William S. Cohen, (1999) " The Security Situation in the Taiwan Strait", Report to Congress pursuant to the FY99 Appropriations Bill (Washingto DC: Department of Defense)

22 Kenneth W. Allen (1997), " PLAAF Modernisation: An Assessment", in Crisis in the Taiwan Strait (eds, James Lilley and Chuck Downs), pp. 224-232

Bibliography

Allen, Kenneth (1997), " PLAAF Modernisation: An Assessment", *Crisis in the Taiwan Strait* (eds, James Lilley and Chuck Downs), pp. 224-232

Bickford, Thomas (2001), "Myths and Realities of China's Military Power", *Foreign Policy* Vol 6 No. 14.

Bristow, Damon (2000), "The Military Balance Across the Taiwan Strait Does China have the Edge?", *Mainland Affairs Council and Graduate Institute of Political Science, NSYSU.*

Cohen, William (1999) " The Security Situation in the Taiwan Strait", *Report to Congress* pursuant to the FY99 Appropriations Bill (Washington DC: Department of Defense)

Cohen, William (1999), "Future Military Capabilities and Strategy of the People's Republic of China.". *Report to Congress* pursuant to the FY99 Appropriations Bill (Washington DC: Department of Defense)

Cordesman, Anthony (2000), "The Conventional Military Balance in China and Northeast Asia", *Center for Strategic and International Studies*.

Fischer, Richard (2000), "Taiwan needs US arms," *Asian Wall Street Journal*

Gill, Bates and James Mulvenon (2001), "China's Nuclear Agenda", *New York Times*.

Gill, Bates and Michael O'Hanlon (1999), "China's Hollow Military", *The National Interest* No. 56.

Harding, Henry (1992), *A Fragile Relationship: The United States and China since 1972*, Washington D.C., Brookings Institution.

Isenberg, David, (2002) " Taiwan defense: Finger on the 'enter's key", *Asia Times*

Lee Che-Fu, "China's Perception of the Taiwan Issue"

Li Jia (2000), "The Taiwan Issue : A Sensitive Barometer of US-China Relations", *The National Committee on US-China Relations.*

Nolt, James (2000), "The China-Taiwan Military Balance" in *Across the Taiwan Strait: Exchanges, Conflicts and Negotiations* (eds, Winston L. Yang and Deborah A. Brown)

O'Hanlon, Michael (July 2000), "Can China Conquer Taiwan?", *International Security* vol 25 No.2.

Promfret, John (2000), "Beijing stresses 'One China' to Taiwan," *Washington Post*.

State Council of the People's Republic of China, "the One China Principle and the Taiwan Issue," Beijing March 2000, http://chinadaily.com.cn.net/highlights/taiwan/ whitepaper.html; Information office of the State Council of the People's Republic of China, "China's National Defence," Beijing, July 1998.

US Pentagon (2002), "Annual Report on the Military Power of the People's Republic of China", Report to Congress.

Wu, Raymond (2002), "Watch words but seek cross-straits talks," *The Straits Times*.

CPT Fan Sui Siong Kelvin is a Weapons System Officer (ADA) by vocation and is currently serving as Tactical Control Officer at an Air Defence Artillery Squadron. He graduated with a BA (Honours) in Economics from Cambridge University in 2001 and an MA in International and Development Economics from Yale University in 2002.

Synopses of Commendation Award Essays

- ## Airbase Attacks: Striking the Eagle's Nest

  by CPT Song Chun Keet, AID

  CPT Song points out that the airbase holds significant portions of an armed forces' defensive and strike capability. However, due to their size, fixed geographical position and strategic value, they are prime targets for aggressors who may employ a combination of air, surface and even cyberspace attacks. The essay proposes some measures to enhance survivability and expedite post-strike recovery so as to be able to fulfil its mission.

- ## Combat Robots: Promises, Impacts and Reality Checks

  by MAJ Lawrence Ng, Singapore Armour Brigade

  The essay introduces the technology that enables the production of combat robots. It then examines the possibilities in the deployment of combat robots and the corollary impacts on the SAF, but also notes that the challenges of translating theory into practice will serve as a reality check. MAJ Ng concludes by highlighting some possibilities in overcoming the problems so as to realise the vision of practical and useful combat robots.

- ## Computer Game Based Training A New Way of Learning

  by MAJ Adrian Koh Choon Meng, School of Armour

  With the emergence of better educated and technologically savvy National Servicemen, this essay proposes the use of computer games in training and learning in order to leverage upon the qualities of the "Twitch Speed Generation" while remaining mindful of some of the drawbacks. MAJ Koh examines the US experience and proposes how the SAF can learn from it. He concludes with a call for this form of training to complement the existing system so as to create a more positive environment for learning and thus benefit the organisation as a whole.

- ## Creativity Inside the Box

  by LTA Gaurav Keerthl, AFS

  LTA Keerthl's essay reverses the popular exhortation to "think outside of the box" and urges people to change their mindsets, without changing the corporate culture too radically and not to force, upon others, a style that is ill-suited. Within the box of the SAF, personnel are urged to overcome fear of criticism and failure, to create time amidst the stressful environment to think creatively and constantly seek to improve on the *status quo*.

- ## Examining Divergent Sino-Japanese Security Relations: A China Perspective

  by Mr Daniel Tan Kwan Wei, OSC-JID

  Despite close cultural, historical and economic ties, Sino-Japanese security relations have not been cordial. Mr Tan examines this divergence from the Chinese perspective. He cites three main areas of contention. Firstly, China perceives Japan as a security threat - seeing the US-Japan Security

Alliance as a stratagem directed against it. Secondly, China sees Japan as a strategic competitor for regional leadership. Thirdly, Chinese fears the resurgence of Japanese militarism, reflecting the burden of history and the continuing mistrust of Japan.

- ## Deploying Network Centric Warfare: Can the Taste be as Good as the Recipe Promises?

  by CPT Tay Gek Peng, ALS TAB

  This essay outlines the concepts of network centric warfare (NWC) by tracing its main attributes in the physical, information and cognitive domains of warfare. The main challenge is to translate NWC into a force multiplier on the battlefield. CPT Tay proposes a co-evolutionary of mission capability packages and sees effects-based operations as a complement to NWC. Furthermore, he highlights the need for clarity in thought and communication at the strategic level.

- ## Globalisation of the Defence Industry: Opportunities and Challenges for Singapore

  by CPT Yew Chee Leung, G5 Army

  This essay explores the globalisation of the defence industry and seeks to determine its effects on both the international defence industry and Singapore. It goes on to argue that globalisation is not only changing the structure of the defence industry, affecting business strategies and the procurement process, it is also transforming the way defence business is conducted.

- ## Long-Range Military-Related Research and Development

  by LTA (NS) Chee Peng Yong Anthony, DSTA

  LTA (NS) Chee highlights the importance of long-range military-related research and development (LRMR-R&D) for national security and competitiveness. The essay argues that this is an area requiring sustained and strong investment into the future. He cautions that the process whereby new discoveries become practical tools tends to occur over the long term. With cross-feeding advances in other disciplines or fields, innovative weapon systems and ways of fighting can be realised.

- ## Military Aviation Supply Chain Management: Collaboration or Paranoia?

  by OCT Lai Woon Siong Alan, AFS

  The essay highlights the importance of the military supply chain outsourcing and introduces a strategic philosophy that embraces positive prudent paranoia in an era of unprecedented uncertainty as the RSAF explores non-government linked company (GLC) co-operation. OCT Lai goes on to examine RSAF commercialisation, explore best practices from military-commercial supply chain collaborations and discusses two case studies (long vs. short-term partnership and trust vs. imposed penalty) to illustrate the relevance of these concepts to the RSAF.

- ## Terrorism Can it Ever be Comprehended?

  by LTA Ong Seow Wei, AFS

LTA Ong gives an overview of terrorism as a global phenomenon, examining its main motivations rooted in religion/ethnicity, politics or violence. The essay also looks at how terrorism is sustained by sympathisers, a strong sense of identity and cohesion among its members, and state funding and backing. She points to three main measures to tackle terrorism, through halting finance to terrorists, sharing of intelligence and public education.

Book Review:

China's Policy Towards Taiwan: From War to Investment? A Review Article on Sheng Lijun's Books on China-Taiwan Relations

Reviewed by Mr Lim Choo Hoon

The 10th anniversary of China and Taiwan Unification Conference held in Singapore on 27 April 1993 passed without fanfare. Compared to the media attention it received in 1993, the 10th anniversary was a non-event. Apart from a few low-key political and academic conferences held in Singapore, Beijing and Taiwan, the event was largely forgotten. However, in a recent assessment of the strategic environment in the Asia-Pacific region beyond 2001, the tensions at the Taiwan Strait are still seen by defence analysts as the most dangerous part of Asia.[1]

Since the mid-1990s, Taiwan domestic politics has been driving the island to assert its international status as an independent state and to challenge the "one China policy". This development has been exacerbated by growing tensions between the United States and China over the Taiwan issue, as well as by unease in Wahington over China's nuclear weapons program, and in Beijing over the US desire to deploy national and theatre ballistic missile defences.

The central issue in the Taiwan Strait conflict is the principle of "One China". Beijing and Taipei agree on the principle but disagree on the definition of "One China". At the core of that issue is Taiwan's sovereignty. Since the presidential election in 2000 the issue of sovereignty, especially popular sovereignty, has become key to understanding the policy divide. For Beijing there is a single China, and Taiwan is integral to its territory. But Taiwan holds that its sovereignty is sacrosanct and cannot be diminished. Linked to sovereignty are military policies, domestic politics, economic policies, the political order of East Asia, and the future role of the United States in the region.

The literature on Taiwan Strait conflicts has been controversial as most of the publications have taken a stance which is either pro-US, pro-Taiwan[2], or pro-China. Sheng Lijun's study[3] on the China-Taiwan relations seems to be more sympathetic towards China but is substantiated with well-documented evidence and sound arguments.

Sheng is a China-born scholar who has received his education in China and Australia. He has been a research fellow in Institute of Southeast Asian Studies, Singapore since 1995. A prolific writer, Sheng has been very active in publishing research papers and books since the completion of his PhD in International Relations from the University of Queensland, Australia in the early 1990s.

In *China's Dilemma: The Taiwan Issue*, Sheng highlights three main "dilemmas" China faced since Taiwan President Lee Teng-hui's visit to the US in 1995. Firstly, China must balance between its response to Taiwan's provocative policy of steering the island towards independence, and concentrate her "energy and resources on (domestic) modernisation", and deal with the "Taiwan issue at the later stage". Part I and II of the book discuss this dilemma by recounting the historical events leading to Lee Teng-hui's visit to the US in 1995. Sheng sees the US policy as a crucial variable shaping the nature of these complicated three-side relations. And Lee Teng-hui, the trouble maker in the Taiwan Strait conflict.

The second dilemma is that if Beijing's response to Taiwan independence movement is seen to be too mild, it will be ineffective. But if it is too strong, such as missile "testing" and military exercises, it will also be "undesirable". Part III analyses many of these issues by tracing the developments during the four years after President Lee's US trip to his articulation of the "two states theory" in the second half of 1999. This seems to be the most valuable part of the book. Sheng presents a useful chronicle of the changing Beijing's perception and policy from a strategy of peaceful unification to threat of using military force against Taiwan.

The US's involvement in Chinese affairs is the third dilemma. Beijing has resisted US's meddling in the Taiwan affairs. But Beijing also realised that any effective policy to discourage Taiwan's independence must also involve the US. In the final part of the book, Sheng argues that Beijing's leadership seemed to have reached a common strategy towards Taiwan. The best way to deter Taiwan drifting towards independence is to concentrate its efforts on improving relations with the US. Beijing hopes that Washington would realise the importance of a "co-operative relationship with China for its long-term global and regional interests". In this way, it would lessen US support for Taiwan's independence movement. In return, it would not upset the *status quo*, force a response by Beijing, and derail China's efforts at economic modernisation.[4]

Although the book presents a logical analysis of the Taiwan issue, the discussion has several weaknesses. In developing his argument on China-America, China-Taiwan relations, Sheng has over-emphasised the prevalence of the "China threat" view in the US and of the drive for co-operation with the US by Beijing. The analysis does not sufficiently capture the ambivalence with which each side views the other. The ambivalence in the rhetoric of the two countries and realities of their relationships introduce a considerable measure of uncertainty into the diplomatic dialogue. The question of the adequacy of current policy framework and policies for addressing future challenges and conflicts is not discussed in the book.

Sheng's study of the Taiwan issue is based essentially on the China-US geopolitical relationship from 1995 to 1999. When discussing Taiwan's policy, the focus is mainly on Lee Teng-hui and the views of the wider population of Taiwan are ignored. The book offers no analysis of the weakening Guomindang (KMT) as a factor. The break-up of the KMT and its decades-long hold on power on Taiwan have definitely contributed to the unprecedented loss of the presidency to the pro-independence Democratic Progress Party (DPP) in March 2000.

The omission of China-Taiwan relations and the rise of DPP to replace Lee Teng-hui, however, has been covered to some extent, by Sheng's second book, *China and Taiwan: Cross-Strait Relations Under Chen Shui-bian*. In his introductory chapter, Sheng states that the book focuses on developments in cross-strait relations from former President Lee Teng-hui's announcement of his "special state-to-state relationship" theory in July 1999 to March 2001, a year after the election of Chen Shui-bian.

Following his first work on *China's Dilemma*, Sheng argues that "Taiwan missed its best opportunity to cement a favourable and peaceful cross-strait arrangement in the late 1980s and early 1990s when Beijing was most eager to make huge concessions."[5]

The core of the study is contained in chapters 4 and 5 of the book. Sheng examines the contrasting attitudes between Lee and Chen toward the "one China" issue. He draws attention to what he sees as Lee's persistent belief that the Beijing regime would soon collapse. This conviction, he claims, was behind Lee's China policy especially to his "no haste, be patient" attitude to Taiwanese investment in China.

In Sheng's view, Lee's motivation in making his "special state-to-state relationship" declaration was due to two main reasons. Firstly, Lee wanted to influence forthcoming policy by laying the groundwork that would commit his successor, assumed to be a younger KMT supporter, to his own concept of Taiwan's future. Secondly, Lee also wanted to initiate confrontation between China and the United States in order to get the latter to support Taiwan's position.

On Chen Shui-bian, Sheng's view is that though once a radical advocate of independence for Taiwan, Chen has not taken the provocative style of his predecessor since his election in 2000. He notes that since becoming president, Chen shifted from the position that he and the DPP had stood for during past years. This shift removed popular worries about the possibility of a military clash in the strait and helped reduce high tensions that had erupted after the "special state-to-state relationship" pronouncement. However, Sheng is suspicious about Chen's moves and questioned whether the shift is merely a tactical adjustment to allow a temporary breathing space for Chen to consolidate his power before challenging Beijing on the unification issue, or whether it represents a real change of policy.[6]

On Beijing's change of policy towards Taiwan, Sheng notes that China gave up hope on Lee following his US visit in June 1995 but Beijing still preferred seeing the KMT remain in power. Beijing hoped that there would be a retraction of the "special state-to-state relationship" position after Lee leaves office.

Sheng also notes that before the 2000 presidential election, Beijing had correctly predicted that the DPP would not go too far, nor be too radical, even if voted into power. In the words of one Chinese leader as reported by Sheng, Chen was seen as "flexible and pragmatic." Beijing's belief seemed well founded as Chen's flexibility after his election surprised many Taiwan observers. Sheng states that he should be given credit for his flexibility, but cautioned that so far he has been ambiguous on key issues. He draws attention to the subtle wording of Chen's inauguration speech and to ambiguities and word play to avoid the "one China" issue.[7]

In the concluding chapter, Sheng sees Beijing as continuing to use economic engagement; and enhancing its strategic military capabilities and diplomatic pressure as major elements of its future policy towards Taiwan. Sheng argues that economic containment of Taiwan is the most effective way for Beijing to check the island's separatist tendencies. If Beijing can lure Taiwanese investors to the mainland, China will be able to contain the island's economic development, bleeding it of funds and hijacking its technology. A gradual depletion of resources would eventually take its toll on the political will to push for independence. The island's level of economic dependence on China in 2001 was at a "warning" point of 24 per cent, according to Taiwan's Mainland Affairs Council. Sheng argues that should it exceed 30 per cent, Beijing would have the power to influence Taiwanese politics.[8]

To wean Taiwan from dependency on the mainland, President Chen Shui-bian has renewed a "go-south" policy and pledged to upgrade the economy to one that is knowledge-based and technologically creative. Looking at the record so far, Sheng however, is not confident that Chen would be successful in this policy. If Taiwan loses the economic competition, its push for independence will be viewed as essentially meaningless by future generations.[9]

On Sino-American relations, Sheng notes that since George W. Bush was elected, Washington's view of China has changed from that of "strategic partner" to "strategic competitor". But Sheng is optimistic that the September 11 incident would favour future Sino-American relations.[10]

Sheng's analysis on Chen Shui-bian's Taiwan painted a doomsday scenario of Taiwan's attempt towards independence. This scenario may, using Sheng's framework, resolve China's first dilemma - to maintain the *status quo* on Taiwan's position. Beijing's economic containment strategy seems to be effective in preventing Taiwan from moving towards independence in the near future. But the basic Taiwan issue has not been resolved. Without a long-term resolution on this crucial issue, Beijing will continue to live with its dilemmas. For the region, although the tensions over the Taiwan Strait may be quiet for the time being, it remains a potential hotspot for future conflict.

For anyone who is interested to trace the developments of China-Taiwan conflicts in the last two decades and understand China's policy of containing Taiwan's independence movement, these two books are essential readings. Readers are also encouraged to consult other works such as Robert Ross's article on why the US supported Taiwan in 1995-96,[11] and Gerrit W. Gong's edited volume*Taiwan Straits Dilemmas*[12] for other interpretations on this very complex US-China-Taiwan relations.

The abovementioned titles are available for borrowing at the **SAFTI MI Library**. *The catalog references are:*

China 's Dilemma: The Taiwan Issue
Sheng Lijun
DS777.55 SHE

China and Taiwan : Cross-Strait Relations Under Chen Shui-bian
Sheng Lijun
DS799.63 SHE

Endnotes

1 Paul Dibb, "Strategic Trends", Dibb, Paul, *Naval War College Review*, Winter2001, Vol. 54 Issue 1, p. 22.

2 A good representative of pro-US work is Clough, Ralph N., *Cooperation or Conflict in the Taiwan Strait?*Lanham: Rowman & Littlefield Publishers, 1999.

3 Books under review are, Sheng Lijun,, *China's Delimma, the Taiwan Issue*, Singapore: Institute of Southeast Asian Studies, 2001 and *China and Taiwan, Cross-Strait Relations under Chen Shui-bian*, Singapore:Institute of Southeast Asian Studies, 2002.

4 Sheng, *China's Dilemma*, pp.194-96, and 223.

5 Sheng, *China and Taiwan*, p. 117.

6 See Sheng, *China and Taiwan*, Chapter 4, pp.59-65.

7 Chen's speech is in Sheng, *China and Taiwan,* Appendix 3.

8 *Ibid*. p.83.

9 *Ibid*. pp. 122-5.

10 *Ibid*. Postscript, pp. 120-1.

11 Robert Ross, "The 1995-96 Taiwan Strait Confrontation", *International Security*, Fall 2000, Vol. 25, Issue 2, 87-124.

12 *Taiwan Strait Dilemmas: China-Taiwan-U.S. Policies in the New Century,* edited by Gerrit W. Gong, Washington, D.C.: Center for Strategic and International Studies, 2000.

Mr Lim Choo Hoon is a lecturer in Military History Branch, SAFTI MI. He teaches military history in the Command and Staff Course and Officer Cadet Course. His current research interest is on East Asian military history. He holds a MA in War Studies form King's College, London, and a Ph.D. in East Asian History from the Research School of Pacific & Asian Studies, the Australian National University.

Selected Books and Reports:

Dr Andrew Tan Tian Huat

Dr Andrew Tan Tian Huat is an Assistant Professor at the Institute of Defence and Strategic Studies (IDSS) in Nanyang Technological University, Singapore. He obtained his doctorate from the University of Sydney, a Masters in International Relations from the University of Cambridge and a Bachelors (Honours) degree from the National University of Singapore. He also holds a Diploma in Journalism from the Australian College of Journalism and is a Fellow of the Cambridge Commonwealth Society. He has extensive experience in the private and public sectors, including the Singapore Foreign Service, where he served as Desk Officer for Eastern Europe, Russia, Malaysia and Brunei. Prior to joining IDSS, he taught International Management, for over five years, at the University of Technology, Sydney.

Dr. Tan's research interests are conflict and security issues in Southeast Asia (including aspects such as inter-state tensions, insurgency, terrorism, force modernisation) and he has written extensively on these subjects. *Intra-ASEAN Tensions* (London: Royal Institute of International Affairs, 2000) argues that although the successes of the Association of South East Asian Nations (ASEAN) gave rise to claims that ASEAN constituted a security community, many lingering inter-state tensions, especially territorial disputes, make such claims problematic. Often rooted in historical, ethnic and religious differences, such tensions constrain the depth and growth of regional co-operation and make interstate conflict not impossible. Given the article's contention that ASEAN is a "fragile community", it sees much uncertainty over ASEAN's future prospects or its development as a regional security community.

Armed Rebellion in the ASEAN States: Persistence and Implications (Canberra: Strategic and Defence Studies Centre, Australian National University, 2000) examines three types of security challenges faced by ASEAN states since 1975, namely armed separatism, communist insurgency and Islamic militancy. It argues that the persistence of armed rebellion, particularly those of separatism, indicates that some ASEAN states still have much work to do in building the post-independence legitimacy of their polities. In some cases, these challenges have complicated the relations between some ASEAN states. The author cites cases like Moro separatism (Philippines-Malaysia) and Karen separatism (Myanmar-Thailand). In its conclusion, the paper raises the spectre of a worst case scenario where successful armed rebellions result in the Balkanisation of Southeast Asia and claims that the INTERFET operation in East Timor has dented ASEAN's principle of non-intervention, setting a precedent for other ASEAN peacekeeping missions in the region.

Malaysia-Singapore Relations: Troubled Past and Uncertain Future? (Hull: University of Hull, 2001) sees the Malaysia-Singapore relationship as an important case study of intra-ASEAN tensions. Central to the paper are three questions. Firstly, is the bilateral relationship one of a security community, where the peoples and elites hold stable expectations of peace and large scale, organised preparations for war against each other are absent, or is it one of mutual deterrence? Secondly, is there an arms race between the two countries? And thirdly, if the potential for violent conflict exists, what can be done to ameliorate it? After examining these important questions, Dr Tan notes that there is much at stake for both countries and that the relationship is too critical to be allowed to lurch from crisis to crisis.

Malaysia's Security Perspectives is a working paper published by the Strategic and Defence Studies Centre, Australian National University. In it, Dr Tan argues that Malaysia' security perspectives are influenced by many factors, including geography, history (especially the Malayan Communist Party insurgency), Malay nationalism, defending the territorial integrity of the far-flung federal state, the KESBAN approach of "Development as Security", the impact of strong political personalities, the so-called "idiosyncratic" factor, intra-ASEAN tensions and, most recently, the growth in the threat of militant Islamist challenges. Dr Tan argues that Malaysia perceives its most serious threats as emanating from within, rather than from external attack and that Vision 2020 is the best way of securing the Malaysian state. However, Dr Tan also notes that Malaysia has moved to upgrade its conventional capabilities so as to participate more effectively in UN peacekeeping, enforce its many territorial claims and work towards a certain degree of strategic parity with its neighbours.

Dr Tan, together with his IDSS colleague, Dr. Kumar Ramakrishna, has also contributed to and edited *The New Terrorism: Anatomy, Trends and Counter-Strategies* (Singapore: Times Academic/Eastern Universities Press, 2002). The "new" features of terrorism include mass casualties, the religious dimension, network organisational structure as well as some continuity with older forms of leftist and nationalist forms of terrorism. Chapters have also been contributed by terrorism experts, such as Bruce Hoffman and Rohan Gunaratna, with particular focus on trends and patterns in the Asia Pacific, Southeast Asian perspectives on Islamic terrorism and formulating strategies to counter the new terrorist phenomena.

Conflict and security issues in Southeast Asia will, in the foreseeable future, remain a subject area of grave concern to many of our readers. Much remains to be done before the threat of Al Qaeda/Jemaah Islamiyah is neutralised and numerous regional issues Acehnese and Moro separatism, territorial disputes to name a few have yet to be resolved. As such, we can probably look forward to more publications from Dr Tan in these fields.

The above publications are available at the SAFTI Library.

Personality Profile:

General Van Tien Dung

After generations of military and political struggle in Vietnam, the Communists achieved final victory with the conquest of Saigon on the 30th April, 1975. This "Great Spring Victory" ended 30 years of war, which saw the defeat of the colonial French, whom General Van Tien Dung fought at the decisive 1954 battle of Dien Bien Phu, then the United States and finally the South Vietnamese government in the Ho Chin Minh Campaign. As the Chief of the General Staff of the army from 1953-78, General Van Tien Dung played instrumental roles in all these campaigns. However, it is debatable if it was really Dung or his predecessor, the more popular General Vo Nguyen Giap, who was the true strategist behind these victories.

General Van Tien Dung was born on 2nd May, 1917 in Co Nhue village in a suburb of Hanoi. In his youth, Van Tien Dung never thought of becoming a soldier. He did however take an interest in the cause of national liberation and construction which drew him towards revolutionary activities. As a textile worker in 1936, he took an active part in a movement to fight the French who were then the colonial power. Similar to other Vietnamese of peasant stock with little schooling, he was recruited a year later into the Indochina Communist party run by Ho Chi Minh and was to take part in the leadership of Fraternity Association among textile workers. Dung was then only 20.

Soon after his recruitment, the French arrested and imprisoned Dung in 1939 for belonging to an illegal organisation, but through

his resolve and aid from Party members, he managed to escape from prison. Upon returning to the Party in April 1945, he became secretary of the Northern Party Organisation and was also concurrently appointed permanent member to the Northern Revolutionary Army Committee.

On 13th August 1945, the day that the Japanese surrendered to the US, the Indochina Communist party convened a national congress and decided on the resolution to end foreign aggression and restore national independence, before the arrival of Allied troops. Dung was tasked to assist in laying the groundwork for the preparation of the general insurrection of August 1945. Consequently, on 25th August 1945, one million people from Saigon and neighbouring areas, protected by armed groups marched through the city and established communist mile. The August revolution of 1945 put an end to 80 years of French colonialisation, abolished the monarchy and established Vietnam as an independent nation.

The French government countered by taking a series of urgent measures aimed at re-establishing French sovereignty. In the war of resistance against the French, Dung was made the commander and political commissar of various military regions. In one of the more significant campaigns during the anti-French war in 1952, Dung was asked by then President Ho Chi Minh to be the commander and political commissar of Brigade 320. With a command of 10,000 troops, the army successfully crossed the Red River for the first time to penetrate into the enemy controlled area which was a pivotal strategic position for the northern battlefields. Previously, it was thought not possible to dispatch a large-scale army unit to this area as it was easily exposed to enemy bombardment. However, with the support from the army, the local militia, and the guerrillas from within and outside the region, Brigade 320 scored a resounding victory with appropriate military tactics. This triumph put many enemy troops out of action, expanded territorial control under the resistance and enabled them to set up more guerilla bases. Thereafter, the Vietnamese continued their offensive and defeated the French at the famous battle at Dien Bien Phu in 1954. On 26[th]April 1954, the Geneva Conference met and conferred sovereignty upon Vietnam, but stipulated that the southern half of Vietnam be handed over to a provisional administration, to be returned after two years. However, soon after the agreement was signed, Washington, with the French government's consent set up a pro-western regime in Southern Vietnam. Once again, the war for national liberation continued, one which would last for the next 20 years.

In the war against the United States, Dung's roles and contributions were numerous in many military campaigns and operations. In the last months of 1974, Dung's personal planning and directing of the Central Highlands campaign opened up a series of military operations in the South. By using diversionary tactics, Dung succeeded in causing the Americans to inaccurately speculate about their objectives, allowing the Northern Army to speed up their deployment of forces. This vastly improved the North's fighting position and created the right conditions for the final offensives effectively cutting short the time needed for the liberation of South Vietnam from two years to one.

Soon after the Central Highlands campaign, came the historic "Ho Chi Minh Campaign" in January 1975, which was personally led by Dung, the appointed army Commander in Chief. For this final offensive of the war, Dung had under his command an army of 800,000 men, the third largest in the world supported by tanks and aircraft. Whilst waves of armed forces launched swift attacks, locals and military personnel inside and surrounding Saigon rose to join the regular army to form a sweeping force to liberate the country. On 30th April, 1975, the 55-day communist offensive culminated in the fall of the United States backed Saigon government. The Americans were forced to withdraw after losing 58,000 soldiers over a period of 20 years.

It often remains a point of dispute as to which communist general was more instrumental in the fall of Saigon. Though Dung had put himself at the forefront in his memoir in 1976, supporters of the more well-known communist general, Vo Nguyen Giap, then defence minister, argued that it was the latter that did most of the planning. Regardless of which general should have been more deservingly credited, both Western and Vietnam historians have recognised Dung as an outstanding military commander and strategist whose brilliant planning and execution of great victories stunned the Western world. In February 1980, Dung was elected to the Party's Politburo and appointed Minister of Defence. However, he was dropped from the Politburo in 1986 as the ruling party adopted new market-orientated reforms. Dung was then criticised as being too autocratic in the people's army congress. He was replaced as defence minister the next year.

After his fall from grace, Dung retreated from the limelight. In his memoir, Dung once said "A small nation with a small land mass and a small population which knows how to consolidate and knows its leadership can defeat a greater power." Apt words from one who has played an instrumental role in achieving victory over a mighty military power. On the 17th March 2002, Dung passed away at age 85 after a prolonged illness in Hanoi's Central Military Hospital. He would always be revered by the Vietnamese as one of their greatest military leaders during the two wars of resistance.

Bibliography

1. Van, Tien-Dung, *Our Great Spring Victory*, New York: Monthly Review Press (1977)

2. McGarvey, Patrick, *Visions of Victory*, California: Hoover Institution (1969)