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**The Centre of Gravity and Its Application in
Limited Warfare**

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ABSTRACT

The concept of centre of gravity was first introduced by Clausewitz to military area in his masterpiece: *On War*. It has been widely used in recent years. However, the interpretations of the concept are seriously confused. Different people and different organisations define the term according to their own understanding. The problems caused by the confusion of the concept in wars and conflicts demonstrate the imperative to refine the concept.

In order to explore the possibility of providing a way out, the thesis follows the theme: theory – practice – theory. It tries to achieve four objectives: concluding the natural meaning of the concept of centre of gravity, finding out the current confusion of the concept, refining concept of centre of gravity, creating a strategy and operational centre of gravity analytical model with the Chaos and Complex Theory, and putting forward some suggestions about future application of the concept.

In Chapter One and Two, the thesis analysed Sun Zi, Clausewitz, Liddell Hart, Jomini, Mao Zedong, John Warden, the US Army, Navy, Air Force, Marine Corps, and Joint Chiefs of Staff's related ideas about the concept. It seems that all of them believe that centre of gravity is where one has to focus his effort, and attacking centre of gravity is the most effective and practical way to realise the objectives. Based on the common understanding, the thesis used Chaos and Complex theory to refine the concept to adapt it to non-linear war, to make it as an objective and effectiveness-oriented concept. A strategic and operational model were built in Chapter Two.

From Chapters Three to Six, the thesis applied the refined concept and new models to four wars under the circumstances of limited conventional warfare. Given the fact that the centre of gravity has different characters in different kinds of wars, this thesis selected two short wars (the Falklands War and 2003 Gulf War) and two stalemated conflicts (the Vietnam war, and Palestine and Israel conflict) to conduct case studies.

The four case of studies showed that the refined concept and new models were able to principally explain the successes or failures in the wars. The studies also provided some revelations for the thesis to discuss the application of the concept in future warfare. However,

the application of the concept is a kind of art, not science. Using it to analyse a historical war or operation is one thing, applying it to direct a war or operation is fundamentally different.

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ABBREVIATIONS

CAS	Complex Adaptive System
CC	critical capability
COG	center of gravity
CR	critical requirement
CV	critical vulnerability
DOP	Declaration of Principles between Palestine and Israel
EEC	European Economic Community
JCS	U.S. Joint Chiefs of Staff
NATO	North Atlantic Treaty Organisation
NLF	National Liberation Front of South Vietnam
PLO	Palestine Liberation Organisation
RAAF	Royal Australia Air Force
RUSI	Royal United Services Institute
UN	United Nations
US	United States of America
USAF	U.S. Air Force
USAWC	United States Army War College
USMC	U.S. Marine Corps
USN	U.S. Navy
WMD	weapons of mass destruction

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Introduction

The concept of centre of gravity was first introduced to military thought by Carl von Clausewitz. In his masterpiece, *On War*, he defined it as ‘the hub of all power and movement, on which everything depends. That is the point against which all energies should be directed.’¹ The importance of the concept in military planning and operation was stressed not only by Clausewitz, but also by his followers. Clausewitz saw the fundamental task in war as being able to ‘identify the enemy’s centre of gravity.’² The US Joint Pub 3-0 believes that ‘destruction or neutralization of enemy centres of gravity is the most direct path to victory,’ and the concept is a useful tool to analyse friendly and enemy sources of strength as well as weaknesses and vulnerabilities.³ The US Air Force advocates that striking directly at an adversary’s strategic or operational centre of gravity is a key theme of air and space power’s maneuver advantage.⁴

However, this important concept is full of confusion. Besides Clausewitz’s definition, the US Air Force defines centres of gravity as enemy’s major vulnerabilities. The US Army and the US Navy believe the centre of gravity is the source of power of an operational system. The American Joint Chiefs of Staff’s definition is a combination of the Services’ main ideas. In Joint Pub 3-0, centres of gravity are defined as ‘those characteristics, capabilities, or locations from which a military force derives its freedom of action, physical strength, or will to fight.’⁵ Given the US’s leading position in developing modern military theory, the confused understanding in the US military forces also has a strong influence on other countries’ understanding of the concept. In Australian and New Zealand Defence Force Command and Staff Colleges, the centre of gravity is commonly regarded as enemy’s force projection capability.⁶

¹ Clausewitz, Carl Von, *On War*, Michael Howard, Peter Paret (ed. & trans), Princeton: Princeton University, 1976, pp.595-596.

² Clausewitz, pp.617-619.

³ US Joint Chief of Staff, *Joint Pub 3-0: Doctrine for Joint Operations*, February 1995, III-20.

⁴ US Air Force, *Air Force Basic Doctrine*, September 1997, p. 17.

⁵ Ibid.

⁶ The conclusion came from the author of the thesis when studying in New Zealand Defence Force Command and Staff College.

The confusion of the concept is caused partly by the translation from German to English and partly by the different cultures and capabilities of different services. It is reasonable that different service should have a different kind of way to conduct operations. But the concept of the centre of gravity is an analytical tool for strategic or operational planning. If it is confused, it could seriously weaken the effects of joint operations. In Operation Desert Storm, this difference among the US services caused quarrels among senior US commanders about the allocation of combat resources. The Commander in Chief of the US Central Command, army General Schwarzkopf identified the Republican Guard as the centre of gravity of the campaign, while the Joint Air Force Component Commander, Lt. General Horner had a number of centres of gravity, with the Iraqi leadership as the most important one. The Republican Guard was just listed fifth in its centres of gravity category. During the operation, Schwarzkopf repeatedly suggested Horner to allocate more air sorties to attack the Republican Guards and ground troops.⁷ However, Horner largely ignored his suggestions. The attacks on the Republican Guards were never heavy or sustained enough to destroy them.⁸

Facing the confusion, some military specialists have begun to rethink Clausewitz's definition. For instance, Lieutenant Colonel J. Echevarria II, director of National Security Affairs in the Strategic Studies Institute at the US Army War College argued that Clausewitz's centre of gravity is not what we thought. It means a 'focal point', neither a strength nor a weakness. 'A centre of gravity exerts a certain centripetal force that tends to hold an entire system or structure together; thus a blow at the centre of gravity would throw an enemy off balance or even cause the entire system to collapse.'⁹ Colonel Richard Iron, Director-General of Development and Doctrine of British Army, pointed out that the current definitions have overlooked the relations between opponents.¹⁰ Unlike this kind of approach to reinterpret what Clausewitz had

⁷ Michael R. Gordon and Bernard E. Trainor, *The Generals' War: The Inside Story of the Conflict in the Gulf*, Boston: Little, Brown and Company, 1995, pp. 199-202.

⁸ John A. Warden III, 'Employing Air Power in the Twenty-first Century', in *The Future of Air Power in the Aftermath of the Operation Desert Storm*, Richard H. Shultz, Jr., Robert L. Pfaltzgraff, Jr.(ed.), Alabama: Air University Press, 1992, p. 75.

⁹ J. Echevarria II, 'Clausewitz's Centre of Gravity: It's not What We Thought', *Naval War College Review*, Winter 2003, p. 115.

¹⁰ Richard Iron, 'What Clausewitz (Really) Meant by 'Centre of Gravity'', *Defence Studies*, Autumn 2001, pp. 109-112.

meant in *On War*, this thesis tries to refine the concept according to the general meaning of the concept and the real need.

The refinement of the concept is based on the assumption that some important principles of war are the same all the time. 'Surprise', 'deception', 'concentration', 'quick action', 'taking initiative', and 'flexibility' etc., have been not only observed by ancient Roman armies, but also by modern American digital forces. Time and cultural differences cannot deprive the universality of the principles. This is why Sun Zi's *The Art of War*, written more than two thousand years ago is still the masterpiece in the modern era. The new strategy or tactic is just the combination of these principles with real situation. For example, the 'concentration' in network-centric warfare means to concentrate fire from widely dispersed troops in the theatre, while in Clausewitz's time, it means putting troops together in a designated area.

Given the importance of the centre of gravity in war, therefore, it could be considered that the idea of attacking the centre of gravity exists on the battlefield throughout history. Not only Clausewitz had it, some other military strategists had it as well. The centre of gravity is only a name to express a certain idea, by which Clausewitz might try to make easier to understand and use the principle. In fact, Clausewitz has taken a number of such metaphors as 'friction', 'fog', 'culmination', and 'mass' etc., from the other areas to express military ideas. Although, the current definitions are diversified, they still have some common points. So, it is possible to find out the general meaning of the centre of gravity from the ideas of some strategists and military organisations.

War is non-linear in nature, but the original centre of gravity concept is a linear one. Although Clausewitz had some non-linear ideas about the centre of gravity concept, neither was it clearly expressed in the definition, nor did his followers regard it. Because of the interdependence and interactions between various components in a non-linear war system, it is very difficult for a commander to use the current definitions to identify which component is the centre of gravity. Therefore, it is useful to combine the general meaning of the centre of gravity concept with the non-linear theory when refining the concept. For this purpose, two non-linear theories, the Chaos and Complex theories will be selected to analyse the shortcomings of current definitions, and to find out what needs to be improved in the refined concept.

The refined definition will be an effectiveness and objective-oriented concept. It stresses the importance of concentrating effects of one's effort, the close relationship between the centre of gravity and the objective, and the interactions between the components. Based on the refined concept, the thesis will set up strategic and operational centre of gravity models respectively.

In order to check the validity of the refined concept, the thesis will consider some case studies with the concept. Although, 'the idea of centre of gravity can apply to all levels and kinds of conflict, and can accommodate a wide range of 'targets'',¹¹ this thesis will only apply the concept to limited warfare. As George F. Kennan pointed out, 'People have been accustomed to saying that the day of limited war is over. I would submit that the truth is exactly the opposite: that the day of total wars has passed, and that from now on limited military operations are the only ones that could conceivably serve any coherent purpose.'¹²

Considering the characteristics of the centre of gravity varies in different kinds of warfare, the thesis will select four limited wars after World War II. Two of them are short wars, and the other two are protracted conflicts. In the cases of the Vietnam War, the Palestinian and Israel conflict, and the 2003 Gulf War, the thesis will analyse the strategic centres of gravity of the warring sides. In the case of the Falklands War, it will highlight the analysis of operational centres of gravity of Argentina and Britain.

These case studies not only serve the purpose of refining the concept and models, but also improve the understanding of the application of the concept. In the last chapter, the thesis will turn to discuss four questions about its future application. They are: how to identify the centre of gravity, how to attack the centre of gravity, how to deal with the change of the centre of gravity, and whether a terrorist organisation has a centre of gravity.

¹¹ Colin S. Gray, *Modern Strategy*, New York: Oxford University Press, 1999, p. 96.

¹² Trumbull Higgins, *Korea and the Fall of Macarthur: A Precise in Limited War*, New York: Oxford University Press, 1960, p. 154.

Generally speaking, the thesis follows the theme: theory – practice – theory. It tries to achieve four objectives: concluding the natural meaning of the concept of the centre of gravity, finding out the current confusion of the concept, refining the concept of the centre of gravity and creating a strategy and operational centre of gravity analytical model with the Chaos and Complex Theory. It will also put forward some suggestions about the future application of the concept.

It has to be pointed out that identifying and defending friendly centre of gravity is as important as identifying and attacking enemy's centre of gravity. However, this thesis will primarily focus on how to identify and attack enemy's centre of gravity.