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**Centre of Gravity Analysis:
A Practitioner's Guide To
Three Essential Methods**

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Centre of Gravity Analysis: A Practitioner's Guide To Three Essential Methods

"The first task, then, in planning for a war is to identify the enemy's centres of gravity, and if possible, trace them back to a single one"

— Carl von Clausewitz, *On War*

Abstract

In the fog of war, correct identification of the enemy's Centre of Gravity (CoG) and its sources of strengths and weaknesses can turn the tide, much like the Allies did in the Battle of the Atlantic by dismantling the U-boat system's vital links rather than chasing U-boats alone. This paper analyses three prominent methods —Milan Vego's hierarchical framework spanning CoGs across strategic, operational and tactical levels; Dr. Joe Strange's CG-CC-CR-CV model linking capabilities to vulnerabilities; and Dale Eikmeier's 'does/uses' test for swift actor identification —using Operation Desert Storm as a common example for consistency. Each of the methods' excels in context: Vego for unravelling layered campaigns; Strange for specific targeting; and Eikmeier for rapid planning. By mastering understanding of all methods, practitioners gain tools to cross-validate their conclusions, avoid pitfalls like mistaking heels for Achilles and adapt to shifting threats, thus blending Clausewitzian insight with real-world situations for planning decisive operations.

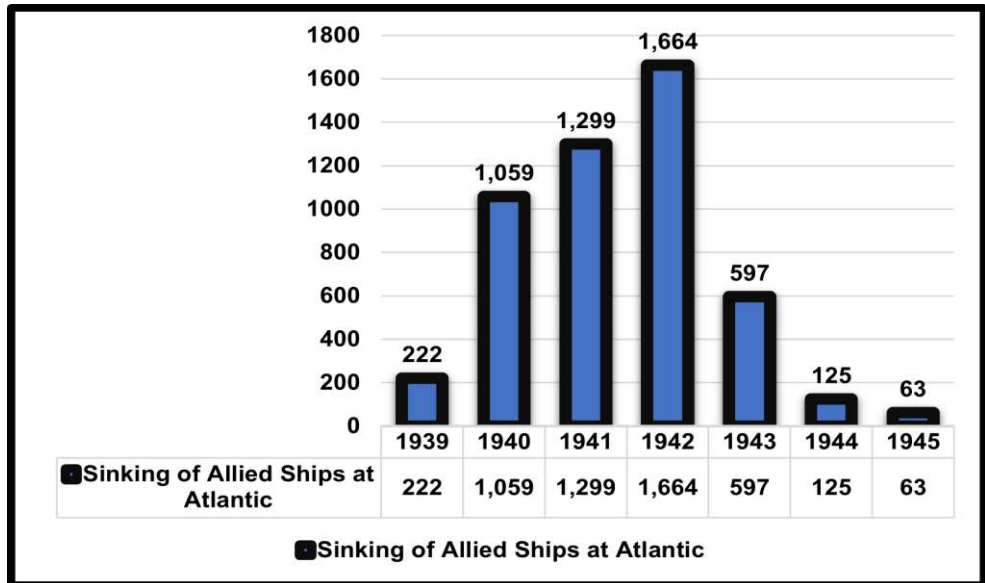
Keywords: Centre of gravity (CoG), *Coup d'oeil*, Operational Art, Vego's method, Dr Strange's CG-CC-CR-CV, Eikmeier's ends-ways-means, Cultural Shift

Introduction: The Persistent Challenge

In the spring of 1942, German U-boats were sinking Allied merchant ships in the Atlantic at an alarming rate. Admiral Karl Dönitz's submarine fleet threatened to sever the lifeline connecting America to Britain. Yet within two years, the Battle of the Atlantic had turned decisively in favour of the Allies.

What changed? The Allies had successfully identified and attacked the Centre of Gravity (CoG) of German naval power which included the U-boats, their integrated system

Figure 1: Allied Ships Lost in Atlantic Crossings due to U-Boats (Roskill, 1954–1961)



of capabilities and critical requirements that made them effective (Miller, 1995).

This historical example illustrates why CoG analysis matters in war. Getting it right focuses effort, resources and operational design on what truly matters. Getting it wrong stretches out combat power in attacking symptoms rather than causes, peripheral targets rather than decisive ones.

Bernard Brodie argues that in Book VIII of *On War*, Clausewitz stresses that sound strategy requires locating the enemy's proper "Centre of Gravity" so that target could be focused where it will be most effective. He also links this CoG to the commander's *coup d'oeil*, the intuitive ability to identify with the whole conduct of war (Bernard Brodie, 2022). The influential Howard and Paret translation renders it as "the hub of all power and movement, on which everything depends"—a phrasing widely cited in military literature (Clausewitz, 1976 (Original work published 1832)). Yet this brief treatment left critical questions unanswered, leading to multiple different interpretations (R. Iron, 2001). Should we target enemy leadership? Elite forces? Logistics? Will to fight?

Three methodologies have emerged as dominant frameworks: Milan Vego's hierarchical approach taught at the US Naval War College; Dr. Joe Strange's **CG-CC-CR-CV** model widely adopted in US joint doctrine; and Dale Eikmeier's ends-ways-means method with its innovative "does/uses" test. Incidentally, all from US.

Aim & Methodology

This article aims to throw light on understanding of each method and by comparative analysis provide some clarity on when to employ a particular approach and in the end give some practical guidance for integrating CoG analysis into planning processes. There is no intention of advocating for a single "correct" method but the hope is to equip the practitioners of Operational Art with multiple analytical tools on one of the most demanding challenges and it is recommended that proficiency in all three will enable military practitioners to cross-check their analysis and avoid common pitfalls. For maintaining consistency, example of Op Desert Storm has been used throughout which allows direct comparison across methods*.

Conceptual Foundation: Why CoG Analysis Matters

"A key characteristic, capability or source of strength which provides freedom of action, cohesion, will to fight and enables victory or prevents defeat".

—Indian Naval Operations Manual II (2012)

CoG is conventionally understood as the centre of enemy power, the feature, capacity or place where the enemy sources freedom of action, physical force or determination to fight. The problem is that it is very difficult to differentiate between the CoG and other significant targets. Any good enemy has many precious resources at their disposal like command posts, supply bases, communications centres, key terrain, elite forces etc. Not all are CoGs. The CoG is that component whose degradation or loss will have decisive impact on functioning of the whole system—implications that fundamentally change the ability of the enemy to accomplish his mission. Identifying CoGs improperly results in loss and stalemate whereas the correct CoG analysis results in decisive results with economy of effort.

Consider the bicycle analogy for a simple understanding about relevance of CoG. The wheels, frame and handlebars in a bicycle are all important components of the system. However,

* Adequate analysis is available in open domain and is a neutral case for Indian audience who are the primary target of this article. Here, also wherever feasible, studies of authors based from outside USA have been taken as source.

the CoG of the propulsion system (if we may call it) is the chain, without which, functioning of all the other parts become irrelevant as there will be no motion. On the same note, the quest of CoG during military operations is to identify that component which, when taken away, brings a system down rather than degradation.

The Vietnam War is an apt case, as the US forces performed superbly on tactical front but failed operationally as they failed to address the real CoG, which was the North Vietnamese political will and popular support which proved resistant to conventional military pressure (Smith, 1994).

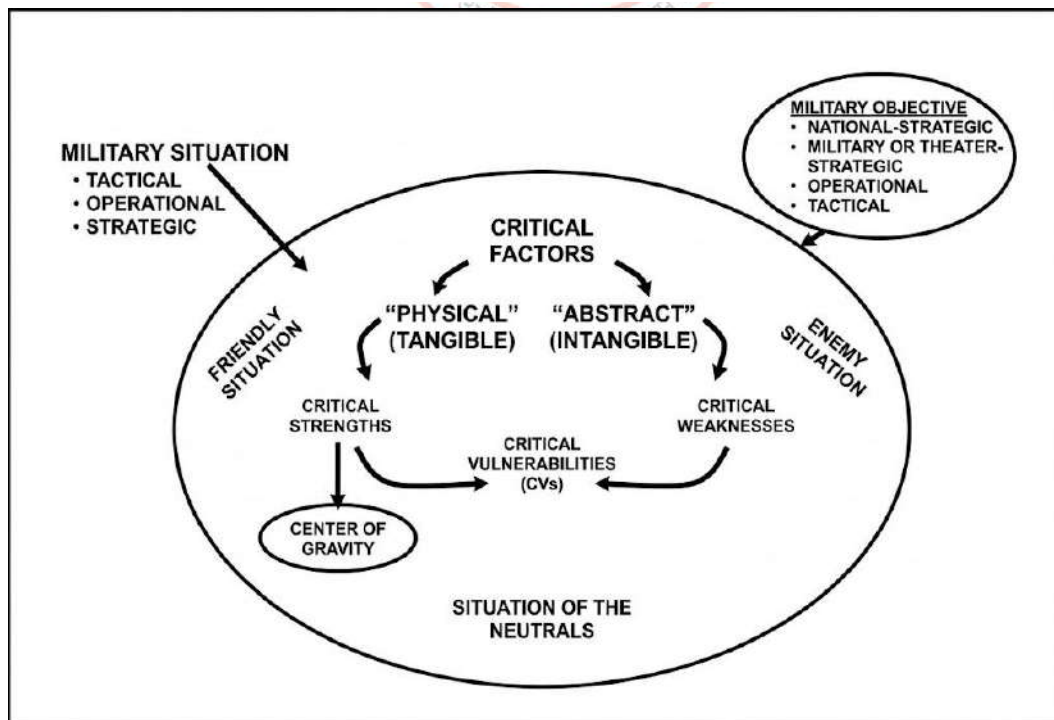
Method 1: Milan Vego's Hierarchical Approach

Core Methodology

Milan Vego defines the CoG as the principal source of physical or moral combat power at each level of war. His key contribution is hierarchical clarity: a formation that is a CoG tactically may be only a supporting element operationally and that operational CoG in turn serves a higher strategic CoG such as regime survival or national will.

Vego's method moves in three steps: precisely define strategic and operational objectives, determine the decisive conditions required to achieve them and then identify the enemy force or

Figure 2: Milan Vego's concept of Critical Factors and Centre of Gravity



Source: Milan N. Vego, 2009

element whose defeat or neutralisation secures those conditions. In general, non-military and military centre of gravity can be differentiated. At the national level and in a western-style democracy, a centre of gravity is usually the top civilian leadership and its will to fight. In a non-democratic state, such a centre of gravity is the authoritarian or dictatorial leader and his inner circle and their will to fight. A non-military centre of gravity can also be a totalitarian ideology of the communist or fascist/Nazi variety. In other cases, the justness of the cause or the government's legitimacy might be a centre of gravity. In a hostage-taking situation, the hostages themselves, not the terrorists or the state holding them, can be considered the enemy's centre of gravity. In such a case, the enemy uses the hostages as leverage to accomplish his objective. This produces a nested set of CoGs that logically connect strategic intent, operational design and tactical action (Milan N. Vego, 2009).

Application to Operation Desert Storm (1991)

Consider Iraq's 1990 invasion of Kuwait and the subsequent coalition campaign (from coalition point of view):

Strategic Level

- **Objective:** Compel Iraq to withdraw from Kuwait and deter future aggression.
- **Decisive Condition:** Saddam Hussein's regime concludes that continuing the war threatens regime survival more than withdrawal does (may be through any of the DIME elements or combination).
- **Strategic CoG:** Iraqi regime's stability and continuity.

At the strategic level, the CoG was Saddam's regime itself. No amount of tactical success would matter if the regime remained stable and defiant (likely threat on coalition's allies in West Asia will continue).

Operational Level

- **Objective:** Liberate Kuwait and destroy Iraq's capacity for sustained offensive operations.
- **Decisive Condition:** Iraqi field forces cannot hold defensive positions or conduct effective counterattacks.
- **Operational CoG:** Republican Guard Forces Command.

The Republican Guard constituted Iraq's operational reserve and most capable fighting force. As long as the Guard remained intact and combat-effective, Iraqi forces could potentially contest coalition advances. Destroying the Guard's combat power was therefore essential to operational success. Integrated Air Defence may be considered as CoG for air campaign, however, for ease of understanding, we will stick to only one operational level CoG in this paper (Strange Joseph L and Richard Iron, 2004).

Tactical Level

- **Objective:** Penetrate Iraqi defensive belt in Western Kuwait.
- **Decisive Condition:** Iraqi tactical reserves not able to defend penetrations by allied offensive formations.
- **Tactical CoG:** Iraqi mechanised divisions holding key defensive positions whose defeat enabled penetration (But mainly supported the operational campaign against the Republican Guard).

This demonstrates Vego's cascading relationship from tactical through operational to strategic.

Strengths

- **Clear Separation by Level of War:** Distinct strategic, operational and tactical CoGs prevent political aims from degenerating into target lists.
- **Objective-First Logic:** Starting from the political-military objective helps avoid chasing merely vulnerable but non-decisive targets.
- **Fit with Phased Campaign Design:** CoGs tied to phases clarify how each phase's main effort supports the end state.
- **Commander's Perspective:** The hierarchical structure mirrors how senior commanders think.

Limitations

- **Ambiguity at the Operational Level:** Multiple candidates may fit Vego's criteria; CoG choice remains subjective.
- **High Demand for Intelligence:** Assumes rich understanding of enemy forces and decision-making.

- **Limited Guidance on Attack Methods:** Identifies what to focus on but gives less structure for deriving specific vulnerabilities.
- **Dependence on Clear Hierarchies:** Works best in conventional wars; less suited to irregular or networked conflicts.

Key Takeaway: Vego's method excels at maintaining clarity across levels of war and ensuring operational planning remains tethered to strategic objectives. It is particularly valuable in conventional campaigns with clearly defined military objectives and traditional force structures.

Method 2: Dr Joe Strange's CG-CC-CR-CV Model

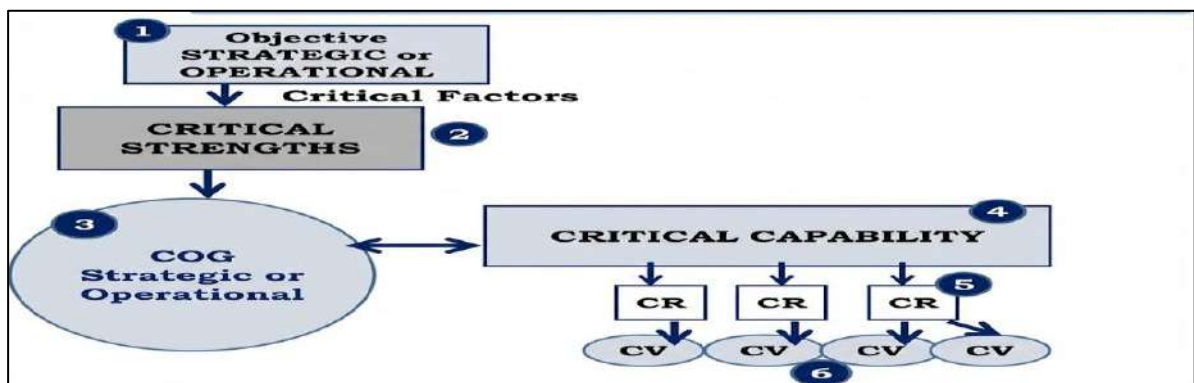
The Four-Component Framework

Dr Joe Strange, former professor at the Marine Corps War College, developed a CoG methodology (Strange Joseph L and Richard Iron, 2004) and this model breaks analysis into four inter-related components:

CG (Centre of Gravity): The source of moral/ physical strength, power and resistance that enables an entity to achieve its goals.

CC (Critical Capabilities): The key capabilities that make that entity a CoG - Teaching faculties that generally asks: "What can it do to you that you fear?" (Strange Joseph L, 1996).

Figure 3: Dr Joe Strange's CG-CC-CR-CV Model



Source: NWP 5-01, 2013

CR (Critical Requirements): The essential conditions, resources and means that enable the critical capabilities to be fully effective.

CV (Critical Vulnerabilities): Those critical requirements that are vulnerable or deficient, such that attacking them yields decisive or disproportionate results. Strange's high point lies in forcing planners to distinguish between the CoG itself and the broader system that makes it effective. More importantly, it provides a logical pathway from identifying the CoG to designing operations that can defeat it (Strange Joseph L, 1996). The framework recognises a fundamental truth: you rarely destroy a CoG directly. Instead, you attack the critical vulnerabilities in its supporting system, degrading critical capabilities until the CoG can no longer function effectively. Same is explained by citing example of the Battle of Atlantic mentioned earlier.

Case Study: Battle of the Atlantic (Strange Joseph L, 1996) (Gist of the example used by Dr Joe Strange)

From the German perspective:

CG: German U-boat Fleet: The German Navy's submarine force constituted the primary instrument threatening allied strategy.

Critical Capabilities:

- Tonnage warfare capability—sinking merchant ships faster than replacement.
- Operational disruption—prevent US buildup force and logistics in Britain.

Critical Requirements:

- Operational mass (adequate number of U-boats at sea).
- Intelligence on convoy routes.
- Secure communications for "wolf pack" tactics.
- Extended-range capability via supply submarines.
- Surface speed and night-fighting advantage.

Critical Vulnerabilities:

- Mid-Atlantic air gap that gave U-boats freedom to operate.
- Centralised command and control via radio transmissions.
- Vulnerable supply submarines ("Milch cows").

- Production versus attrition balance.

The Allied campaign targeted **each vulnerability logically** by long-range patrol aircrafts which closed the air gap, codebreaking allowed access to communications, hunter-killer groups eliminated supply submarines and enhanced anti-submarine warfare capabilities increased attrition beyond sustainable levels, thereby making U-boat operations increasingly untenable.

Application to Operation Desert Storm

CoG: Republican Guard Forces Command. They were Iraq's operational reserve and most capable fighting force with loyalty to regime. It possessed the potential to intervene in coalition advances or restore Iraqi defensive lines if penetrated and maintain Iraqi control of Kuwait (Michael Evans, 2012).

Critical Capabilities:

- **Operational Counter-Offensive Capability** in quick time frame.
- **Deep Strike Capability** to strike coalition operational reserves, logistics facilities, and staging areas.

These capabilities define why Republican Guards qualified as CoG. Remove these and Iraq loses its ability to continue occupation of Kuwait or threaten coalition forces.

Critical Requirements: Trained, cohesive combat units; freedom of manoeuvre via intact routes; protection from air attack; robust logistics; reliable command and control; actionable intelligence; strong morale (US GOA, 1997).

Critical Vulnerabilities: Highly centralised command and control centred on Baghdad, predictable deployments, forward logistics sites, limited bridges, exposed air-defence sites and inferior night-fighting capability compared to coalition forces (Singh M, 2022).

Coalition Campaign Design Flowing from CV Analysis

By the time ground operations commenced on 24 February 1991, the Republican Guard had been significantly degraded, through systematic attacks, the critical vulnerabilities such as command and control nodes, bridges, logistics hub and Republican Guard formations using early air campaign (US Army Logistics Management College, 1991). When Coalition forces executed

the "left hook" manoeuvre, they faced an enemy already deprived of many critical requirements. The result was rapid operational success with minimal coalition casualties.

Strengths

- **Systematic Vulnerability Identification:** Links the CoG to specific weaknesses which can be attacked.
- **Prevents Target List Mentality:** Focuses planners mind on relationships and mechanisms instead of disconnected targets.
- **Offensive and Defensive Use:** Can analyse friendly CoGs, helping identify and protect own vulnerabilities.
- **Wargaming and Pedagogy:** Clear categories support wargaming and teaching.

Limitations

- **Checklist Behaviour:** Staff can lapse into creating long lists of "critical" items as opposed to picking out what is essential.
- **Subjective CoG Definition:** Broad definition means different teams may nominate different centres.
- **Analytical Workload:** Complexity of Work Load when more than one CoGs are recognised.
- **Physical Focus:** More appropriate for physical CoGs more than moral CoGs such as national will or popular support.

Key Takeaway: It is good at bridging the gap between identifying the CoG, planning operations to eliminate it. Well established technique of CC to CR to CV provides a logical and systematic pathway of campaign design.

Method 3: Dale Eikmeier's Ends-Ways-Means Method

The "Does/Uses" Test

Dale Eikmeier proposed a simplified path that is derived from **Ends-Ways-Means** logic stating that CoG defines the entity that will perform the critical action required to accomplish the objective. He describes CoG as "the primary entity that possesses the inherent capability to achieve the objective" which he stresses should be an actor with agency rather than a passive

resource or condition (Dale C. Eikmeier, "Let's Fix or Kill the Center of Gravity Concept, 2016). The does/ uses test is a filter—if the candidate being proposed actually performs the critical action, it can be the CoG; however, if it is just being used or consumed by the person who would perform the critical action, then the candidate is re-classified as a critical requirement.

Four-Step Process

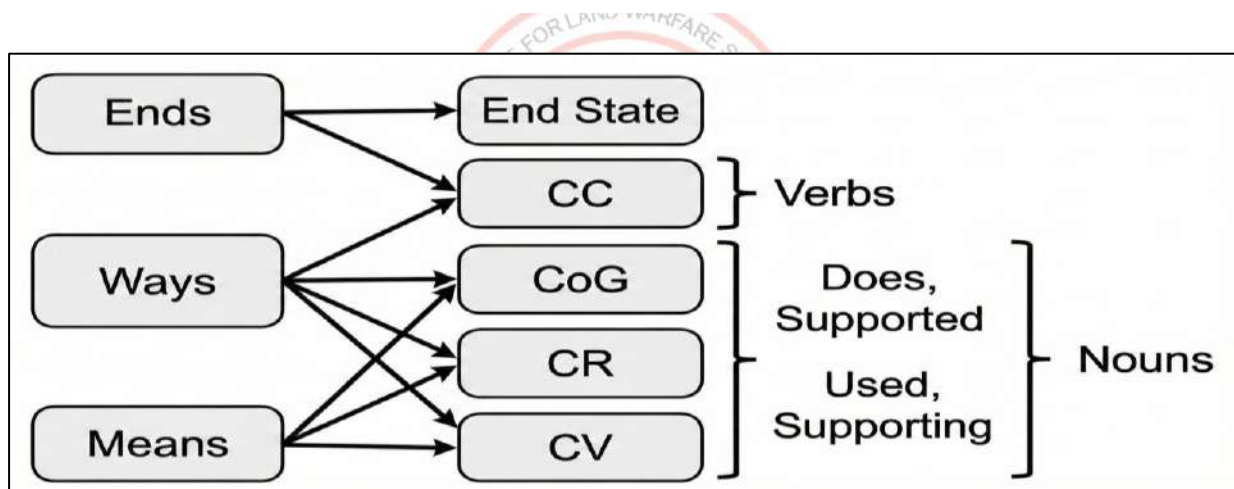
Eikmeier's method follows a straightforward sequence (Dale C. Eikmeier, A Logical Method for Center-of-Gravity Analysis, 2007).

Step 1: Identify the Objective Precisely.

Step 2: Identify the Critical Capability (what must be done to achieve the objective).

Step 3: Identify the CoG (who/ what Does this?).

Figure 4: Dale Eikmeier's Ends-Ways-Means Method



Source: Dale C. Eikmeier, A Logical Method for Center-of-Gravity Analysis, 2007

Step 4: Identify Critical Requirements and Vulnerabilities (what the CoG uses, and which of these are vulnerable).

The Railroad Analogy

Eikmeier uses this analogy to make the does/uses distinction clear (Dale C. Eikmeier, Center of Gravity Analysis, 2006). Consider a railroad system whose purpose is moving freight from point A to point B:

- **Objective:** Transport cargo from origin to destination.
- **Critical Capability:** Movement of freight across distance.
- **CoG:** The locomotive—only the locomotive inherently does the moving.
- **Critical Requirements:** Tracks, fuel, trained operators, switching infrastructure, signalling systems, rolling stock etc.
- **Critical Vulnerabilities:** Any critical requirement that is both essential and feasibly attacked.

Application to Operation Desert Storm

Step 1- Iraqi Objective: Maintain control of occupied Kuwaiti territory and prevent coalition forces from restoring Kuwait's sovereignty.

Step 2- Critical Capability: Iraq must be able to block or defeat Coalition offensive operations at the operational level.

Step 3- CoG Identification (Apply Does/Uses Test)

Consider the candidates:

- **Iraqi Political Leadership:** Sets strategy but does not physically block Coalition attacks; *uses* armed forces to fight. Not the operational CoG.
- **Integrated Air Defence System:** Protects forces but does not stop ground offensives; used by ground units. Not the CoG.
- **Logistics Network:** Used by combat forces but does not fight. Not the CoG.
- **Lines of Communication:** Enable movement but do not block attacks; infrastructure used by fighting forces. Not the CoG.
- **Republican Guard Forces:** Directly engages Coalition forces, blocks penetrations, conducts counterattacks, and defends occupied territory. The Republican Guard does the fighting that blocks Coalition objectives. This is the CoG (Dale C. Eikmeier, "Let's Fix or Kill the Center of Gravity Concept, 2016).

Step 4: Critical Requirements and Vulnerabilities

What does the Republican Guard use to block Coalition offensives?

Critical Requirements: Command and control networks, air defence coverage, logistics (POL, ammunition, maintenance), engineer support, intelligence, freedom of manoeuvre, morale and unit cohesion.

Critical Vulnerabilities: Forward POL storage sites, command and control nodes, key bridges and chokepoints, predictable assembly areas, air defence radars.

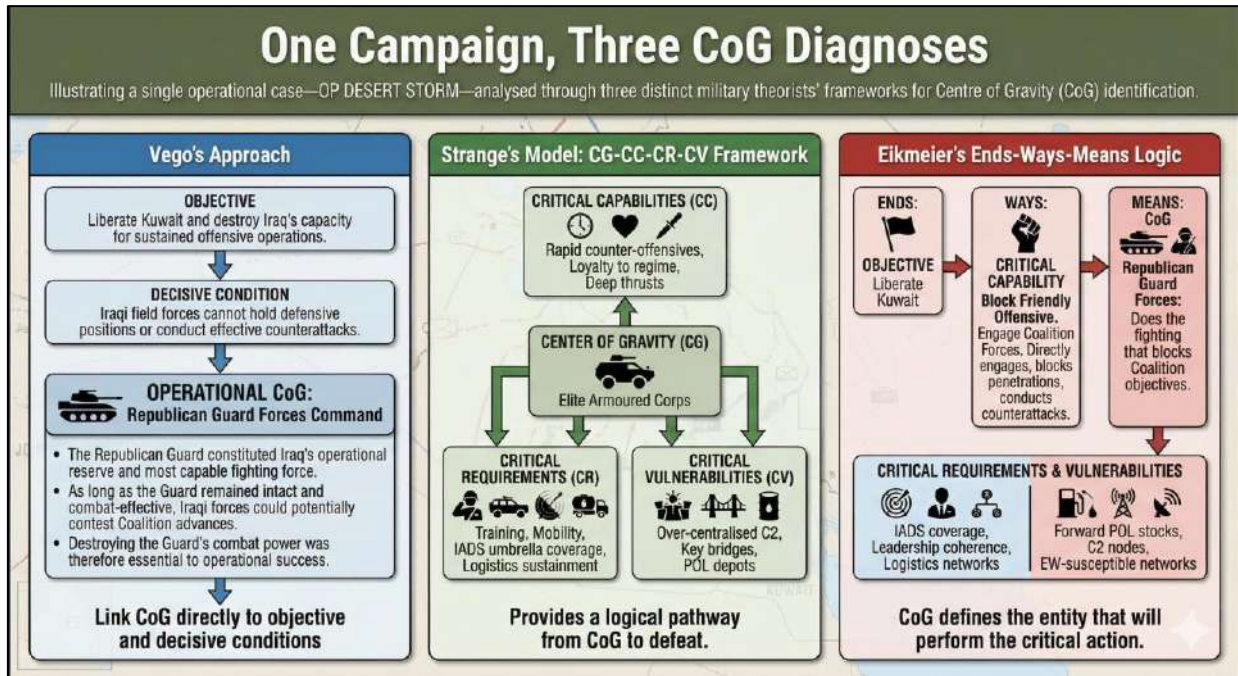
Strengths

- **Simplicity and Clarity:** The “does/ uses” test is a quick and logical tool to making sure it is consistent.
- **Error Prevention:** CoG as an acting entity eliminates confusion between abstract ideas and tangible resources.
- **Alignment with Effects-Based Design:** Emphasising capabilities and effects fits with the objective of getting results as opposed to destruction of targets in modern operations.
- **Training Value:** Proper steps and analogies— junior officers have an easy way to understand the concept.
- **Cross-Check Utility:** The method is useful in complementing other CoG analyses that confirm that a chosen CoG is in action

Limitations

- **Oversimplification of Risk:** In some environments, the process of finding a single entity that "does" the critical action can be artificially reductive, particularly if capabilities are distributed among groups (i.e. terrorist organisations).
- **Limited Moral Dimension:** Much focus on physical CoGs makes it difficult to capture moral factors.
- **Judgment Still Essential:** As it proposes candidates, commanders must exercise judgement wherein there are multiple entities with critical functions.
- **Systemic Gaps:** More emphasis/ focus on actors that can result in overlook/ ignore vulnerabilities in supporting systems, which Strange's method tends to highlight.

Figure 5: AI Generated Image comparing the three frameworks for CoG Analysis (Summary)



Key Takeaway: Eikmeier's does/uses method helps to cut through the confusion and provides a fast logical test for determining which is a centre of gravity and which is a critical requirement. It is particularly helpful in time constrained planning or working with less experienced staff.

Comparative Analysis: Selecting the Right Method

Table 1: Comparative Analysis of the CoG Models

Method	Best For	Ideal When	Key Test
Vego (Hierarchical)	Multi-level campaigns with clear objectives across strategic/ operational/ tactical levels	Planning large-scale operations where tactical actions must link to strategic outcomes	Objective → Decisive Conditions → Main Force

Strange (CG-CC-CR-CV)	Complex environments needing detailed targeting and vulnerability analysis	Ample planning time, good intel, building detailed target sets	What it does (CC) → Needs (CR) → Weak spots (CV)
Eikmeier (Does/Uses)	Time-constrained planning, rapid validation, teaching juniors	Clear enemy structures, limited complexity	Does the action or "uses" support?

Different operational contexts favour specific methods. Experienced planners can sequence them: Eikmeier first for speed and baseline clarity; Strange for vulnerability depth; and Vego for hierarchical alignment. Cross-validation of convergence is required to build robust analysis.

Common Errors and How to Avoid Them

Error 1: Calling Everything a CoG

The Problem: Ports, lines of communication, leadership or networks all get labelled CoGs until the term is so diluted that nothing stands out anymore.

How to Avoid: Apply Eikmeier's does/uses test. If it does not act decisively, it is support and not CoG. A port is able to enable combat power but is not engaged in fighting.

Example: In the Battle of the Atlantic, CRs like secure communications, supply submarines, torpedoes, intelligence of allied shipping routes and air gap were vital (used) but the U-boat fleet was the CoG because it carried out the decisive action of attacking allied ships (does).

Error 2: Treating Vulnerabilities as CoGs

The Problem: Weak flanks or fuel dumps as "CoGs" ignores, what they enable. Confusing Achilles (CG) and Achilles' heel (CV).

How to Avoid: Make use of Strange's framework explicitly: CV - CR - CC - CG. If you cannot get the complete chain, then you must have gone wrong somewhere.

Example: Forward POL storage (a critical vulnerability). But fuel is not the CoG - it's what the Republican Guard (the CoG) uses to maintain freedom of manoeuvre (a CR) which allows it to rapidly counterattack (a CC).

Error 3: Assuming the Existence of One Single CoG Always

The Problem: Doctrine sometimes seems to imply that there must be exactly one CoG at each level which forces artificial choices.

Reality: There can be more than one CoGs - by service element, by phase of the war, by campaign or by geographical location. However, for a particular mission at a particular level, defining a single campaign CoG will usually be the most clear planning focus.

How to Avoid: When creating so-called descriptions, be clear about scope and context. In 1991, Iraq had one strategic CoG (regime survival), one operational CoG for the ground campaign (Republican Guard) and arguably one for the air campaign (Integrated Air Defences). These do not go against each other - they work at different levels or domains.

Error 4: Fixed CoG Analysis

The Problem: Using CoG as slavishly fixed during the course of a campaign when it may require adjustment as circumstances may change.

How to Avoid: Build CoG reassessment into planning cycles. Recognise adaptive enemies will defend identified CoGs or alter their way of operating.

Example: In Operation Iraqi Freedom, the Iraqi military's CoG changed from Republican Guard divisions (conventional operations) to insurgent networks and sectarian militias (in subsequent insurgency). Campaign plans that do not adapt CoG analysis to changed circumstances risk losing operational coherence.

Cultivating Operational Art: Creating a Culture of Centre of Gravity Analysis in the Indian Armed Forces

The concept of the Centre of Gravity (CoG) is still crucial in the operational art to differentiate key sources of enemy strength, physical or moral and the fringe ones in the complexity of war. Without it, resource allocation will be subjective and inefficient, just like night firing without night sights: blind spending with little effect. CoG achieves a decisive focus and according to Clausewitz this entails:

- Overcoming planner's bias.
- Identifying the best allocation of scarce resources and averting diffused and haphazard planning.

- The ability to give rational arguments of how to choose decisive points, missions, tasks, hierarchy of objectives, critical capabilities, Lines of Operations and Lines of Effort.

Structured exposure to operational art especially CoG identification should be made to officers of the Indian Armed Forces especially at the Defence Services Staff College (DSSC) to ensure that the officers develop analytical rigour and cultural change.

DSSC Curriculum

DSSC offers the first organised exposure with an extensive training module on operational art using CoG concepts, where the student officers practice at a level which resonates with their exercise appointment. Nevertheless, there are limitations: limited number of appointments, in which CoG analysis can be favourably exercised by the novice learners and conflicting or competing academic requirements when exercises are being conducted. There is a need to find a solution that will enhance learning without overloading the student officers.

Every nominee to DSSC has to learn the campaign chosen as the subject of the military history paper that year, so every student has sufficient background information on that campaign. This is an opportunity: the student officers re-evaluate the CoG of their chosen campaign, both their own and the enemy forces, and discuss it using the goal-oriented paradigm of Vego, the critical vulnerabilities (CVs) of Strange, or the ends-ways-means approach of Eikmeier. Campaign rotation every year—based on the DSSC system of examinations, will establish a repository of knowledge, resolving ambiguity of CoG analysis that can penetrate the larger professional landscape within armed forces.

Wargames and Field Formations.

The mandatory use of CoG analysis in all operational planning briefings and wargames should be introduced as a mandatory requirement in field formations. At every level, commanders should demand that staff review CoG aspects prior to submitting of plans, based on techniques studied at DSSC.

Higher Command Courses

This is where opportunities need to be exploited to sharpen and refine CoG analysis skills by facilitating the discussion/ debate of various CoG scenarios in the modern conflicts/ scenarios, keeping up to the dynamic character of warfare.

Cultural Transformation

This innovative curriculum will inculcate a culture of rigorous, debate-based CoG implementation against dogmatism approaches that have become obsolete in the era of hybrid threats. Through DSSC to higher command courses and with field experience in formations, officers will gain the skill of CoG analysis—strike an enemy where he is weak and defend own strength.

Conclusion: CoG Analysis: Art and Science

CoG analysis is in the intersectional zone of both art and science in designing operations. The three ones introduced includes the hierarchical approach by Vego, the CG-CC-CR-CV model by Strange and the does/uses test offered by Eikmeier as all three of them are disciplined thinking frameworks.

Important Lessons for Practitioners.

- **Know How to Use Multiple Techniques:** Not only decent fluency in Vego, Strange, and Eikmeier in predicting cross-validation, but also in pointing out blind-spots.
- **Match Method to Context:** Choose on mission complexity, time, staff competence, quality of intel and type of commander.
- **Iterate:** CoGs shift/ change, hence adjustments are required according to new intelligence/ adaptation of adversary.
- **Dodge Pitfalls:** Separate CoG with targets/ vulnerabilities/ abstracts. Explain levels and call assumptions in question.
- **Manage the Uncertainty:** Multiple candidates for CoG? Be honest and critical while analysing- hedge plans.

CoG analysis is needed in the modern world of operational planners who are confronted with highly hybridised threats across multiple environments. Confronted by near peer conventional opposition, asymmetric regional strength or non-state terrorists, these approaches assist in offering an answer to the fundamental question: What do we need to attack and in what order?

Keep in mind Clausewitz's insight— that war is the domain of uncertainty, friction and chance. CoG analysis does not do away with these — it is an approach to a way of thinking clearly in spite of them. If used well, then it will concentrate effort in the areas where it is needed

most. If used incorrectly, then it becomes cause of confusion. Master the ways but keep them with scope to adjust them as per the situation.

Works Cited

- Bernard Brodie.(2022). The Continuing Relevance of On War,. *Defence Studies* 22, no. 3 (2022): 327-353, DOI: 10.1080/14702436.2022.2030715, 45-48.
- Clausewitz, C. v. (1976 (Original work published 1832)). *On War*. Princeton University Press. .
- Dale C. Eikmeier. (2007). A logical method for center-of-gravity analysis. *Military Review* , 87(5), 62–66.
- Dale C. Eikmeier. (2007, September-October). A Logical Method for Center-of-Gravity Analysis. *Military Review* 87, no. 5 (September-October 2007), pp. 62-66.
- Dale C. Eikmeier. (2016). "Let's Fix or Kill the Center of Gravity Concept,., *Joint Force Quarterly* 83 (4th Quarter 2016), 109-115. Retrieved from <https://ndupress.ndu.edu/media/news/article/969689/lets-fix-or-kill-the-center-of-gravity-concept/>
- Eystein L. Meyer. (2022). "The centre of gravity concept: contemporary theories, comparison, and implications,.". *Defence Studies* 22, no. 3 (2022): 327-353, DOI: 10.1080/14702436.2022.2030715.
- Michael Evans. (2012). Centre of Gravity Analysis in Joint Military Planning and Design:Implications and Recommendations for the Australian Defence Force,., *Security Challenges* 8, no. 2 (2012):, 81-106.
- Milan N. Vego. (2009). *Joint Operational Warfare: Theory and Practice*. Newport, RI: U.S. Naval War College,.
- Miller, N. (1995). *War at Sea: A Naval History of World War II*. Scribner, .
- Naval Warfare Publication. (n.d.). *Naval Warfare Publication (NWP 5-01)*.
- R. Iron. (2001). Viewpoint - What Clausewitz (Really) Meant by 'Centre of Gravity',. *Defence Studies* 1, no. 3 (2001): 109-112, DOI: 10.1080/714000041., 109-112.
- Roskill, S. W. (1954–1961). *The War at Sea 1939–1945 (Vols. 1–3)*. Her Majesty's Stationery Office.
- Singh M. (2022, October 19). "Looking Back at Iraqi Air Defences During Operation Desert Storm," *Balloons to Drones*,. Retrieved from <https://balloonstodrones.com/2022/10/19/looking-back-at->

iraqi-air-defences-during-operation-desert-storm/.

<https://balloonstodrones.com/2022/10/19/looking-back-at-iraqi-air-defences-during-operation-desert-storm/>.

Smith, C. J. (1994). *Limited War Theory in Vietnam: A Critique According to Clausewitz*. Defense Technical Information Center (DTIC).

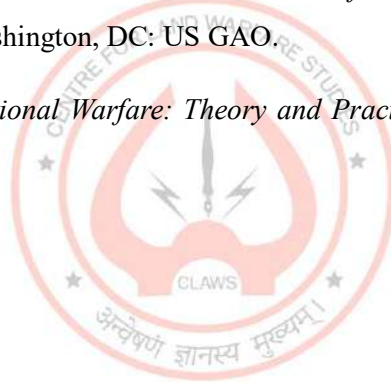
Strange Joseph L. (1996). *Centers of Gravity & Critical Vulnerabilities: Building on the Clausewitzian Foundation So That We Can All Speak the Same Language, Perspectives on Warfighting Series, No. 4, 2nd ed.* Quantico, VA: US Marine Corps University,.

Strange Joseph L and Richard Iron. (2004). *Understanding Centers of Gravity and Critical Vulnerabilities*,. Australian Defence Force Warfare Training Centre.

US Army Logistics Management College. (1991). *Operations Desert Shield and Desert Storm: The Logistics Perspective*. US Army Logistics Management College,.

US GOA. (1997). *Operation Desert Storm: Evaluation of the Air Campaign, Letter Report GAO/NSIAD-97-134*,. Washington, DC: US GAO.

Vego, M. N. (2009). *Joint Operational Warfare: Theory and Practice* . Newport, RI: U.S. Naval War College.



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