

士兵有更好的方法來解決問題

(‘Thinking about thinking’: Soldiers Have a Better Way to Solve Problems)

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A new field of systems thinking has emerged with the potential to transform the U.S. Army and its professional military education system. This new field could create emergent and adaptive leaders by placing a high value on creative and critical thinkers. It offers a new way to view problems and build intuitive thinking. Essentially, it could be the next frontier for the Army to create a superior cognitive force or, more specifically, a metacognitive force.

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一個新的領域系統性思考已經出現了，它可能改變美國陸軍與其專業的軍事教育系統。這個新領域可以透過具有高度創意及批判性的思考，培育出應變性與適應性強的領導者。並且提供了一種可以直視問題和建構直接思維的新方法。從本質上來說，它可能是下一個陸軍創造卓越認知力量的先驅，更具體來說，是一種後設認知(對自己認知過程的思考)的力量。

This new approach is called Systems Thinking v2.0, and it has the potential to fundamentally change and improve how leaders can think through, identify and solve problems in the Army. It is a new approach to problem-solving and concept mapping that can help build a new metacognitive warfighter.

這種方法被稱為系統思維 2.0 版，它可能從根本上去改變及改進陸軍領導者們如何去思考、確認和解決問題。這是一種解決問題和概念轉換的新方法，並可以幫助建立一個新型態後設認知的戰士。

Systems Thinking v2.0 is predicated on new discoveries and ideas:

- Systems thinking is the emergent property of four simple rules known as DSRP, an acronym for distinctions, systems, relationships and perspectives. That is, systems thinking itself is not a linear method or framework but an emergent property of the four simple rules from which systems thinking emerges. This is predicated on the idea that systems thinking is a complex adaptive system with underlying rules.

系統思維 2.0 版新的發現和想法描述如下：

- 系統思維是被稱為 DSRP 的四個簡單規則的新興屬性，它是區別、系統、關係和觀點的首字母縮寫，也就是說，系統思維本身並不是線性方法或框架，而是系統思維出現後的四個簡單規則的新興屬性，這個觀點是基於系統思維在潛在規則下是具有複雜自我適應的系統。
- There are many systems thinking and design frameworks (System Dynamics, Soft Systems Methodology, Systems Engineering, Army Design Methodology, etc.) and still other nonsystems thinking frameworks (Strengths, Weaknesses, Opportunities and Threats [SWOT]; Observe, Orient, Decide and Act [OODA]; etc.) but these frameworks are built on the common set of simple rules of DSRP.
- 有許多系統思考和設計框架（系統動力學、軟系統方法論、系統工程、陸軍設計方法論等）和其他非系統思維框架（優勢、劣勢、機會和威脅[優劣分析];觀察、定位、決定和行動 [決策與行動];等）但這些框架都建立在 DSRP 的一套常見的簡單規則之上。

- The four rules of DSRP are a simple cognitive algorithm not only for how humans think and can think more systemically about any system but also for how we understand existing knowledge and create new knowledge.
- DSRP 的四個規則是一個簡單的認知演算法，不僅適用於人類的思考方式，而且可以更有系統地思考任何系統，還包括我們如何理解現有知識和創造新知識。

As a field, systems thinking attempts to understand how to think better about real-world systems and real-world problems. For the past 100 years, but especially since the 1950s, the field of systems thinking has amassed specialized methods and frameworks to better understand the real world, what systems theorists call Systems Thinking v1.0. Systems Thinking v2.0 instead supplies universal rules that can be used to more closely align human mental models with the real world (i.e., the process of metacognition).

系統思考領域試圖去理解如何更有效地思索現實世界的系統，和現實世界的問題。在過去的 100 年中，尤其是自 1950 年代以來，系統思維領域積累了專門的方法和架構，以更有效地了解現實世界，理論家稱之為系統思維 1.0 版。系統思維 2.0 版提供了通用規則，在現實世界中可更緊密地符合人類心理模式。（即後設認知的過程）。

Supporting Military Work

People across the military use Systems Thinking v2.0 to support their work. Systems Thinking v2.0 is taught at West Point within the systems engineering program to prepare future warfighters with necessary metacognitive skills. It also has been used to problem-solve during recent Army missions, and it should be examined as a way to transform professional military education across the Army.

支持軍事工作

全軍上下使用系統思維 2.0 版來支持他們的工作。西點軍校的系統工程計畫更教授該版思維，準備做為必要的後設認知技能，以培育未來的戰士，在最近的

陸軍任務中，它也被用來解決問題，並且將其視為足以轉變整個陸軍專業軍事教育的一種方式。

Cornell University, N.Y., professors Derek and Laura Cabrera are the brains behind the Systems Thinking v2.0 model. They've also launched Plectica, a visual systems mapping software based on this approach. This free software (available at www.Plectica.com) allows you to do systems thinking and visualize, analyze and synthesize concepts to gain a greater understanding of ideas or concepts in their entirety.

紐約康乃爾大學的教授德瑞克和蘿拉-卡布瑞拉是系統思維 2.0 版模型背後的主腦人物。他們還以此一思維為基礎推出視覺系統圖資軟體 Plectica，這個免費的軟體（可在 www.Plectica.com 網址利用）可讓你做系統思考並綜整、分析眼前所見一切，以獲得更豐碩的全般想法或概念。

Derek Cabrera, who teaches systems thinking, modeling and leadership at Cornell and is on the board of advisers for the Department of Systems Engineering at West Point, explained in an interview:

德瑞克-卡布瑞拉在康乃爾大學教授系統思維、模式化及管理，並且是西點軍校系統工程系的顧問，他在接受採訪時解釋說：

“The more we learn about systems thinking and how it works, the more it is clear that it dovetails with the field of metacognition. There is a growing research base in the interdisciplinary field of metacognition that demonstrates the far-ranging effects of increasing metacognition. ... Metacognition sits at the crossroads of cognitive science, learning science, neuroscience, psychology, sociology and epistemology [the theory of knowledge]. Metacognition—meta equals self-referential plus cognition equals thinking—can be thought of as ‘thinking about thinking,’ or keeping a watchful eye on how one’s thinking affects how we feel, think further, and behave in the world. When we become aware of the simple underlying rules we use to think—DSRP—we are better able to use these patterned rules to think more systemically about any domain or problem.”

“我們對系統思考及其工作方式的學習越多，就越清楚它與後設認知領域相吻合。在後設認知的跨學科領域有越來越多的研究基礎，它表明了隨著後設認知的增加造成廣泛影響。後設認知位於認知科學、學習科學、神經科學、心理學、社會學和認識論[知識理論]的十字路口。後設認知的後設等於自我認知的反省即等於思考，可以被認為是「思考再思考」，或者密切注意一個人的思維如何影響我們在現實世界中的感受及思考與行為模式。當我們意識到我們用來思考的簡單基本規則-DSRP-我們能夠更有效地使用這些模式規則，更系統性地思考任何領域或問題。

The world is increasingly more complex and uncertain than ever. Cabrera possesses a deep understanding of complexity and discovered four underlying patterns of metacognition universal to systemic thinking: making distinctions, organizing part/whole systems, recognizing relationships and taking perspectives—DSRP. These patterns of thought have successfully brought the field of systems thinking together and offer the building blocks of metacognition; hence, version 2.0. He has demonstrated that systemic thinking and metacognition are not only similar in their underlying structure and dynamics, but also their purpose. He said:

“Both physically and conceptually, we split whole things down into parts or alternatively lump things together to form a new whole. We sometimes say there are just two kinds of scientists, splitters and lumpers. Those who split stuff up and those who lump stuff together. In this new ... volatile, uncertain, complex and ambiguous world, we need folks who can do both. We need a new kind of amphibious mind I call a *splumper*.”

世界變得越來越複雜和不確定。卡布雷拉對複雜性有著深刻的理解，並發現了系統思維普遍存在的四種後設認知的 DSRP 基本模式：作出區分、組織部分或整體系統、識別關聯性和採取觀點。因此，在系統思維 2.0 版中，這些思維模式成功地將系統思維領域融合在一起，並提供了後設認知的基石。他已經證明，系統思維和後設認知不僅在其基礎結構和動力學上相似，其目的也同樣相似。他說：「從物理和概念上來說，我們將整個事物分成幾部分，或者將大量事物結合形成一個新的整體。」我們有時會說只有兩種科學家，分割派和統合派，也就是把東西分開的人和把東西混在一起的人。在這個新的……不穩定、不確

定、複雜和模糊的世界中，我們需要能夠做到這兩點的人。我們需要一種新型的兩棲思維，我稱之為「破裂者」

A Better HQ

An element of a NATO-led mission in Afghanistan demonstrates Systems Thinking v2.0 at work. This element involved moving Resolute Support headquarters to a more resilient structure fit to handle emerging strategic requirements—force manning, Mission Command and flexibility for future missions. While the Napoleonic organizational model that reorganized the military corps remains relevant, Gen. John W. Nicholson, then-commander of U.S. Forces-Afghanistan and the Resolute Support mission, realized that the Resolute Support headquarters no longer fit the purpose of sustained multinational stability operations. He wanted to adapt the headquarters to be able to address emerging localized strategic requirements.

一個更好的總部

由北約領導的阿富汗顧問團在執行任務過程中，展示了系統思維 2.0 版的一個要素。即將堅定決心行動總部轉變成一個更具彈性的結構，以適應新出現的戰略要求-未來任務的人力要求，任務式指揮和靈活性。雖然重組後的軍事組織仍與拿破崙式的軍隊組織互有關連，但美國駐阿富汗部隊和堅定決心行動的時任指揮官約翰·尼科爾森將軍意識到，堅定決心行動總部已不再適合繼續執行多國維穩行動，他希望調整總部結構，以解決新出現具區域性的戰略要求。

Resolute Support was launched after NATO's International Security Assistance Force ended in 2014. Its mission is to focus on training, advising and assisting at the security-related ministries in Afghanistan's institutions, and among the senior ranks of the Afghan army and police.

在北約國際安全援助部隊於 2014 年結束後，堅定決心行動被啟動了，其使命是將重點放在阿富汗各相關安全機構以與阿富汗軍隊和警察單位高階幹部的培訓、諮詢和協助上。

After a recent shift in U.S. South Asia policy, as well as an enduring commitment from NATO and its partnering nations, changes have been made

to the force manning-level constraints of Resolute Support headquarters. Under Nicholson's guidance, these changes afforded Resolute Support headquarters an opportunity to reorganize staff and subordinate commands into a three-pillar functional headquarters that delivers capability to the operational, institutional and strategic areas. The new structure emphasizes perspectives of force generation and functional allocation (work processes and battle rhythm) and codifies these changes by amending existing organizational documentation.

在最近美國南亞政策的轉變以及北約及其夥伴國家的持續承諾之後，對堅定決心行動總部的組織架構限制進行修改。在尼克爾森的指導下，這些轉變為堅定決心行動總部提供了一個可將全體人員和下級指揮部重組為一個三支柱功能總部的機會，為作戰組織和戰略領域提供相關功能。新結構強調戰力生成和功能分配（工作流程和戰鬥節奏）的觀點，並通過修改現有的組織編裝來啟動這些變革。

To support the reorganization effort, Systems Thinking v2.0 was used to perform a functional and requirements analysis, and to identify potential measures of effectiveness for the final headquarters structure. Without Systems Thinking v2.0 and Plectica software to map out the current system, it would have been difficult to isolate the systems, relationships and perspectives requiring attention. The DSRP approach to systems thinking helped create a shared understanding that transcended personalities within the greater Resolute Support headquarters as documents were amended and people communicated through mission orders.

為了支持組織重組工作，系統思維 2.0 版被用以執行運算和需求分析，並為組建目標總部結構找到有效之措施。

如果沒有系統思維 2.0 版和 **Plectica** 軟體來呈現當前系統缺失，將很難區隔需要關注的系統，關聯性和觀點。即使在原始命令修改，官兵透過任務命令進行溝通時，區別、系統、關聯性和觀點的系統思維方法亦可在高階堅定決心行動總部內，排除異議建立共識。

Anyone with military experience understands that reorganizing is nothing new; however, Resolute Support did something innovative. Executing such a reorganization is a monumental task and Resolute Support headquarters is expected to maintain a level of workflow that supports train-advise-assist down to the multiple commands, and to continue to plan, assess and coordinate with superior headquarters. This simultaneous effort can sometimes create opportunities to leverage the capacity of other organizations such as the U.S. Military Academy or the U.S. Army Combined Arms Center, or any of the intellectual capital throughout the military. These consulting opportunities afford a fresh perspective, can be unbiased and allow for operations to be minimally disrupted.

任何有軍事經驗的人都明白，組織重組並不是什麼新鮮事;然而，堅定決心行動做了一些創新的事項。執行這樣向上級的協調建議，重組是一項艱鉅的任務，堅定決心行動總部將確立工作流程，延續既定計畫，並支持下級指揮單位的訓練、諮詢及援助任務。這種多管齊下的作為將有助於如美國陸軍官校或美國陸軍聯合兵種訓練中心等單位，或全陸軍的教育機構，創建可有效發揮功能的機會。這些諮詢機會提供了一個全新的視角，讓相關作業可以準確而不受干擾的運作。

Improving PME

Using and understanding Systems Thinking v2.0 would also allow professional military education to adapt quickly to the changing environment. In essence, it would provide a complex adaptive curriculum allowing us to see learning for what it is: the process of making sense of information and connecting knowledge, leading to a better understanding of our environment. It offers simple rules—DSRP—that could bring about emergent learning.

改善潛在的有效措施

運用和理解系統思維 2.0 版還可以使專業軍事教育，迅速適應不斷變化的環境。從本質上講，它將提供一個複雜的適應性課程，使我們能夠看到學習的本質：理解資訊和連接知識的過程，從而更好地理解我們的環境。它提供了簡單的規則-區別、系統、關聯性和觀點-可以帶來立即的學習。

Systems Thinking v2.0 would move the U.S. military past simple drill and rote memorization and allow it to learn by forming connections between ideas. It would allow the military to analyze and synthesize concepts bringing about emergent learning. In physics, the mass of an object does not equal the mass of all its parts as it also requires energy to bind it together. Here we can think of energy as intelligent thinking.

系統思考 2.0 版將摒除美國軍隊過去死記硬背的單調操練，並開始在各想法之間建構關聯性的學習。它將提供軍方因立即學習而帶來的分析和綜合思考概念。在物理學中，物體的數量不等於其所有的質量，因為它還需要將它們的能量結合在一起。在這裡我們可以將能量視為智能思維。

For example, if we break apart the principles of Mission Command, we cannot gain an understanding by simply putting the pieces back together. We must insert “thinking,” which is essentially the binding energy allowing us to truly understand a concept. By using DSRP, we can insert “thinking” into the equation. The sum of its parts does not provide an understanding of Mission Command, but the sum of its parts plus DSRP does.

例如，如果我們破壞了任務指揮的原則，我們就無法透過簡單地將個別命令重新組合來了解任務。我們必須加入「思考」，此一關鍵結合能量使我們能夠真正理解全般概念。將個別的命令組合起來無助於對任務式指揮的了解，但是透過使用區別、系統、關聯性和觀點的思考，卻可以達到目的。

The Army is a superior fighting force. However, to remain superior, it must evolve and adapt. It must create a superior cognitive and metacognitive force. To do this, the service must build knowledge in order to possess it. Systems Thinking v2.0 helps do this by structuring, organizing and making meaning out of information. By thinking metacognitive (thinking about thinking) and visually mapping our thinking, Systems Thinking v2.0 in concert with proven Army methods—Army design methodology, the Military Decision Making Process and Mission Command—will yield far greater results that are more holistic, traceable and implementable. In the case of Resolute Support, Systems

Thinking v2.0 helped elucidate the structure of the complex Resolute Support headquarters system and enabled innovation and a shared understanding.

陸軍是一支優秀的戰鬥力量。但是為了保持優勢，它必須與時俱進與適應環境。它必須創造出卓越的認知和後設認知力量。要做到這一點，各單位必須明確認知才能擁有它。系統思維 2.0 版通過構建、組織和從資訊中獲取意義來實現此目標。通過後設思考（思考再思考）和視覺映射我們的思想，系統思維 2.0 版與經過驗證的陸軍方法-陸軍軍事決策過程及任務指揮的設計方法-將獲致更全面、可追溯並且確實可行的巨大成果。在堅定決心行動的案例中，系統思維 2.0 版幫助建立複雜的堅定決心行動總部，創新及共識性的系統架構。

Systems Thinking v2.0 provides the Army warfighter a better way to identify and solve any problem. Systems Thinking v2.0 allows warfighters to transform information into meaning by adding deliberate thinking (information plus thinking equals knowledge) into the existing processes. Army warfighters who think about their thinking are better prepared to solve any problem that comes their way.

Essentially, Systems Thinking v2.0 plus U.S. Army equals metacognitive force.

系統思維 2.0 版為陸軍作戰人員提供了更好辨識與解決各式問題的方法。系統思維 2.0 版允許作戰人員，透過在現有流程中加入有意識的思維（資訊加思維等於知識）而將資訊轉化為意義。具備反覆思考能力的陸軍戰士，更可以放手一搏準備解決任何問題。簡單地講，具備系統思維 2.0 版的美國陸軍，才是擁有後設認知力量的勁旅。

Maj. Jamie Schwandt

Maj. Jamie Schwandt, USAR, is a logistics officer and red team member. He is certified as a Department of the Army Lean Six Sigma Master Black Belt and has a doctorate from Kansas State University.

傑米・史瓦特少校

美國陸軍後備部隊的傑米・史瓦特少校係後勤軍官以及假想敵成員，獲為陸軍部頒六西格瑪的黑帶大師，並擁有堪薩斯州立大學的博士學位。

Maj. Thomas Ryan

Maj. Thomas Ryan is a student at the U.S. Army Command and General Staff College, Fort Leavenworth, Kan. He has deployed as both a platoon leader and company commander. He has a master's degree from the University of Arizona.

湯瑪士・里安少校

湯瑪士里安少校係堪薩斯州李文沃思堡美國陸軍指參學院的學員，曾經擔任排長和連長職務，並擁有亞利桑那大學碩士學位。