

The Enabling Leader: How Air Force Leaders Can Enable Emergence and Innovation During Complexity

A Monograph

by

Lieutenant Colonel Adam T. Keith
US Air Force



School of Advanced Military Studies
US Army Command and General Staff College
Fort Leavenworth, KS

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14. ABSTRACT
Today's complex threat environment presents many problems that current Air Force doctrine struggles to address. For this reason, leaders at the operational level must find creative solutions within their resource- and time-constrained environments and bureaucratic hierarchies. How can operational-level USAF leaders foster innovation within their sphere of influence to achieve disproportionate effects, if the bureaucracy naturally discourages emergence? New organizational leadership research called Complexity Leadership Theory (CLT) addresses the tensions between bureaucratic structures and the adaptation required to address complex problems. CLT suggests that enabling leadership practices can help leaders deal with the tension between bottom-up, emergent innovation and the top-down hierarchical control. This monograph uses the Doolittle Raid (World War II) and Operation Bolo (Vietnam) as historical case studies to show examples of enabling leaders. USAF leaders who embody enabling leadership traits can create adaptive space between their ground-level tactical planning teams and higher strategic leaders to successfully foster innovation within their units.

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Approved by:

_____, Monograph Director
G. Stephen Lauer, PhD

_____, Seminar Leader
Eric M. Remoy, COL

_____, Director, School of Advanced Military Studies
James C. Markert, COL

Accepted this 24th day of May 2018 by:

_____, Director, Graduate Degree Programs
Robert F. Baumann, PhD

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Abstract

The Enabling Leader: How Air Force Leaders Can Enable Emergence and Innovation During Complexity, by Lieutenant Colonel Adam T. Keith, USAF, 47 pages.

Today's increasingly complex threat environment presents many problems that current United States Air Force (USAF) doctrine cannot completely solve or struggles to address. For this reason, USAF leaders at the operational level must find creative and innovative solutions within their resource- and time-constrained environments. At the same time, the rigid, top-down USAF hierarchy, due to its bureaucratic nature, constrains both approval and implementation of creative or innovative ideas. So, how can operational-level USAF leaders foster creativity and innovation within their sphere of influence to achieve disproportionate effects if the USAF bureaucracy naturally discourages emergence? New research on leadership and organizational adaptability called Complexity Leadership Theory (CLT) attempts to address the tensions between bureaucratic hierarchical leadership structures and innovative adaptation required to address complex problems. CLT suggests that enabling leadership practices can help leaders deal with the tension between bottom-up, emergent innovation and the top-down hierarchical control. Operational Air Force leaders who embody enabling leadership traits and foster personal relationships and networks can create adaptive space between their ground-level tactical planning teams and higher strategic leaders to successfully foster creativity and innovation within their units.

To better understand how current and future USAF leaders can apply the concepts found within CLT to their own units, this monograph will analyze two successful and highly innovative historical airpower case studies: the Doolittle Raid during World War II and Operation Bolo during the Vietnam War. The case studies feature two different enabling leaders who were able to work beyond the established hierarchy, create adaptive space, and enable novel, emergent operational approaches that had disproportionate effects at the strategic level. Both Lieutenant Colonel Jimmy Doolittle and Colonel Robin Olds found ways to connect diverse groups toward accomplishing a common mission while providing the appropriate amount of conflict to inspire motivation at the entrepreneurial level. The two leaders took intentional actions to encourage team formation, develop mutual trust, and empower actions from network brokers in both the administrative and entrepreneurial systems. If current operational USAF leaders follow these two examples and embrace the concepts illuminated by CLT, they can become enabling leaders who create adaptive space and have the potential to produce novel, emergent results that are much more than just the sum of their parts.

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Acronyms

AAA	Anti-aircraft Artillery
CAS	Complex Adaptive System
CLT	Complexity Leadership Theory
GCI	Ground-controlled Interception
JCS	Joint Chiefs of Staff
MiG(s)	<i>Mikoyan-Gurevich Design Bureau</i> , Soviet-built aircraft
NVAF	North Vietnam Air Force
PACAF	Pacific Air Forces
SAM	Surface-to-air Missile
TFW	Tactical Fighter Wing
USAF	United States Air Force
USAAF	United States Army Air Forces
USN	United States Navy

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Section 1: Introduction

Know the mission, what is expected of you and your people. Get to know those people, their attitudes and expectations. Visit all the shops and sections. Ask questions. Don't be shy. Learn what each does, how the parts fit into the whole... Respect the talents of your people. Have the courage to delegate responsibility and give the authority to go with it. Again, make clear to your troops you are the one who'll take the heat.

—Robin Olds, *Fighter Pilot: The Memoirs of Legendary Ace Robin Olds*

In a quotation from his autobiography, Colonel Robin Olds described his philosophy of leadership when he took command of the Eighth Tactical Fighter Wing in Ubon, Thailand during the Vietnam War. His reflections portray an *enabling leader* who served his organization by facilitating and energizing his team; *connecting* essential groups, inspiring bottom-up tactical innovation, and engaging any restrictive tensions along the way.¹ His leadership style enabled a strategic breakthrough in the air war over Vietnam through the development of new tactics and procedures, and organizational linkages that did not exist prior.

As in the skies over Vietnam in 1967, today's increasingly complex threat environment presents many problems that current United States Air Force (USAF) doctrine cannot completely solve or struggles to address. The US military acquisitions process seeks technological solutions for these capability gaps. However, long-term, technological solutions do not always produce sufficient or timely answers to complex tactical and operational problems.² For this reason, USAF leaders at the operational level must find creative and innovative solutions within their resource- and time-constrained environments. At the same time, they must navigate the rigid, top-down USAF hierarchy to allow for approval and implementation of their creative and innovative ideas. Operational USAF leaders who embody *enabling* leadership traits and foster personal

¹ Mary Uhl-Bien and Michael Arena, "Leadership for Organizational Adaptability: A Theoretical Synthesis and Integrative Framework," *The Leadership Quarterly* 29, no. 1 (January 2018): 98; This paper will use *italics* to highlight key terms from Complexity Leadership Theory to purposefully demonstrate the connection to the concepts and case studies referenced.

² Robert J. Lempert, et al., "Defense Resource Planning Under Uncertainty: An Application of Robust Decision Making to Mixed Munitions Planning," RAND Corporation Report, 2016, iii, xi.

relationships and networks can create *adaptive space* between their ground-level tactical planning teams and higher strategic leaders to successfully foster creativity and innovation within their units.³

The USAF is unique among the service components in the US Military in that tactical and operational-level actions often have strategic consequences for a campaign or large-scale operation. Thus, USAF leaders at the tactical and operational levels have the unique potential to lead teams that can have strategic influence.⁴ Large scale USAF campaigns have a central commander but allow de-centralized planning and execution. This gives the tactical and operational leaders some creativity and freedom to execute their portion of the mission as they see fit, within the commander's intent and overall planning guidance.⁵ Airpower is also inherently very flexible within the constraints of its modern technology. These factors give USAF leaders the ability to harness creative and innovative solutions at the lower echelons. If operational USAF leaders can find new ways to employ their forces and airpower technology, within the commander's intent for the campaign, they can realistically expect to achieve disproportionate, or even strategic-level effects.

Although the strategic capabilities of the USAF make it unique among the service components, the service's organizational structure is similar to the other services. For reasons beyond the scope of this paper, military organizations such as the USAF are traditionally top-down bureaucratic hierarchies. This type of structure, while well-suited for command and control,

³ This paper will use the term 'operational leader' to describe a military leader at the operational level of war. This differs from Dr. Uhl-Bien's definition of 'operational leadership,' as found in her most recent research on Organizational Adaptability. Previous research on Complexity Leadership Theory by Dr. Uhl-Bien used the term 'administrative leadership' to denote the same concept. When appropriate, this paper will use the term 'administrative leadership' in those situations to avoid confusion.

⁴ US Department of the Air Force, Air Force Doctrine, Annex 3-30 Command and Control (Washington, DC: Government Printing Office, 2014), 9.

⁵ Ibid., 8-9.

as well as consistent output and production, is not well-suited for adaptability and innovation.⁶ Older models of organizational leadership often fall short in addressing the challenges of the increasingly complex and interconnected world. The new field of research in Complexity Leadership Theory (CLT) provides a leadership framework that begins to address the tension between a rigid bureaucratic structure and the need for complex organizations to adapt and innovate.⁷

One of the biggest challenges that military leaders face is the requirement to steer their organizations through turbulent environments while being able to adapt and overcome the challenges and threats that come with a globalized world.⁸ The USAF is a hierarchical bureaucracy, which traditionally does not promote high levels of organizational adaptation or innovation. With that in mind, how can operational-level USAF leaders foster creativity and innovation within their sphere of influence to achieve disproportionate effects if the USAF bureaucracy naturally discourages *emergence*? New research on CLT suggests that *enabling leadership* practices can help leaders deal with the tension between bottom-up, *emergent* innovation and the top-down hierarchical control.

This paper looks at two historical case studies to isolate and illustrate the characteristics of *enabling* USAF leadership within a complex environment. Despite CLT's broad scope, there are few studies that have applied military leadership to the scholarship of Complexity Leadership. The paper will use a comparative methodology using Dr. Mary Uhl-Bien's Complexity Leadership Theory as a framework to assess the operational airpower leadership in history. CLT

⁶ Mary Uhl-Bien, Russ Marion, and Bill McKelvey, "Complexity Leadership Theory: Shifting Leadership from the Industrial Age to the Knowledge Era," *The Leadership Quarterly* 18, no. 4 (August 2007): 298.

⁷ *Ibid.*, 299.

⁸ Uhl-Bien and Arena, "Leadership for Organizational Adaptability: A Theoretical Synthesis and Integrative Framework," 89.

will provide a modern and relevant lens to view the leadership interactions that helped encourage innovation and *emergence* during the Doolittle Raid in 1942 and Operation Bolo in 1967.

First, this paper will discuss Uhl-Bien's CLT, including the most recent scholarship on the subject. CLT will illuminate the importance of *enabling leadership* for *organizational adaptability*, creativity, and innovation. Next, this paper will present two historical airpower leadership case studies to illustrate the philosophies, qualities, and considerations leaders must embody to *enable* innovation within the *adaptive space* in an organization. The two specific airpower case studies were selected for their unprecedented approaches to solving the operational challenges they faced with the technology and resources available at the time. The two historical Air Force leaders achieved disproportionate effects against the enemy to realize strategic success from the tactical level. The two historical examples presented for analysis are The Doolittle Raid during World War II and Operation Bolo during the Vietnam War. Finally, the monograph will conclude with a summary of findings and a synthesis of important lessons learned from this comparative analysis.

By using CLT as a framework for comparison, this monograph will focus on the *enabling leadership* traits demonstrated by Lt Col Jimmy Doolittle and Col Robin Olds while planning and leading their respective operations. The case studies will demonstrate that their *enabling leadership* styles, personal connections and interactions, and charismatic personalities allowed them to create the *adaptive space* needed to promote innovation and allow for its execution. Each case study will follow a similar format. First, a discussion of the operation, the strategic threat environment, and the organizational structure and hierarchy for the operation will demonstrate the multiple levels of complexity that each leader faced. Next, each case study will apply the specific criteria for *enabling leadership* to each leader and their operational organizations. Finally, the case study will analyze the *emergent* innovations, adaptations, or creative processes that were the result of the operation and will conclude with a short summary to synthesize the findings.

This monograph will use three different criteria to evaluate each case study through the lens of CLT. The first criteria will look at the complexity of the organizational structure, the conflict, and operational mission. Through analyzing the organization, the operational environment, and mission in relation to the definition of complexity, the study will prove that each leader faced a complex problem within a complex organization. This will help determine if both the USAF (or Army Air Forces) hierarchy and the scope of the combat mission were sufficiently complex for CLT to be a valid theory for analysis. It will also serve to isolate each airpower operation in time and space and demonstrate the need for *enabling leadership* in each instance.

The second set of criteria will then take a qualitative, detailed look at the actions of each operational leader. This will help to see how they *enabled adaptive space* as *enabling leaders*. In their most recent scholarship on CLT and organizational adaptability, Uhl-Bien and Marion suggest that *enabling leaders* set the conditions for *emergence* within the *adaptive space* through the actions of *conflicting* and *connecting*. Doolittle and Olds' actions will be compared to the types of actions that engage both *conflicting* and *connecting*, as described by Uhl-Bien and Michael Arena.⁹ This approach goes beyond the interpersonal leadership variables and looks at the organizational structure in relation to the leader's ability to link separate networks together. At the same time, it assesses how each leader took advantage of the tension and conflict that naturally brings people together, generates solutions, and promotes innovation.¹⁰

The third and final criterion will assess the emergent outcome of the operational leadership challenge. This step will evaluate the operational and strategic impacts of the resulting *emergent* outcome in each study. This step will help to assess the commanders' effectiveness in *enabling adaptive space* to create an innovative, emergent response that could both satisfy the

⁹ Uhl-Bien and Arena, "Leadership for Organizational Adaptability: A Theoretical Synthesis and Integrative Framework," 99.

¹⁰ Ibid., 89.

demands of the *administrative system* and create strategic effects. This will help to link the *emergent* outcomes to each leader's actions and will allow the reader to draw the appropriate conclusions and lessons from the study.

The primary sources used in this monograph include a variety of articles and briefings on Complexity Leadership Theory from Dr. Uhl-Bien and her colleagues. They also include the autobiographies of both Doolittle and Olds, an autobiographical account of the Doolittle Raid by Ted Lawson, some of the original operation planning documents, and an interview of Olds through the Air Force oral history program. The secondary sources include a good number of other Doolittle biographies, accounts of airpower during Vietnam, books and articles about complexity, and other studies that support either the case studies or help lay the foundations of CLT.

Uhl-Bien is the foremost scholar associated with CLT today. Although other experts such as Russ Marion, Bill McKelvey, and Michael Arena team up with her for many of her studies, she is either the primary author or co-author of almost all published CLT literature. Most of the primary sources in this monograph that describe or develop CLT were published within the last decade. Although the concept of CLT is almost twenty years old, Uhl-Bien's more recent research incorporates and expands upon her previous works, as well as those of her colleagues. The article titled "Leadership for Organizational Adaptability: A Theoretical Synthesis and Integrative Framework," is the most comprehensive paper on CLT to published by *Leadership Quarterly* in early 2018. This journal article, as well as the others, relies on decades of research in the fields of complexity science, organizational theory, and leadership theories. Because Uhl-Bien's CLT research is so well-sourced, this monograph only includes one other reference to help the reader to understand complexity: *Making Things Work: Solving Complex Problems in a Complex World* by Yaneer Bar-Yam.

Many secondary sources help to illuminate the complexities during the early stages of the United States' involvement in World War II as well as the intricacies of planning a top-secret

mission to bomb Japan in 1942. George C. Herring's *From Colony to Superpower: US Foreign Relations since 1776* set the strategic stage while several other Doolittle biographies, books about the Doolittle Raid, and scholarly articles provided the specific details necessary. Since Doolittle's autobiography does not focus entirely on the Doolittle Raid, other books and journals provide a deeper level of research into the planning and integration that helped to develop the unique emergent operational approach. *Target Tokyo: Jimmy Doolittle and the Raid that Avenged Pearl Harbor* by James Scott is especially well-researched and provides much of the detail to illuminate Doolittle's *enabling leadership* actions.

Several books about the *Rolling Thunder* air campaign and the Vietnam air war in general help to understand the operational Air Force environment during the Vietnam war and highlight the complexities that Olds faced when he arrived in theater in 1966. *Rolling Thunder: The Strategic Bombing Campaign, North Vietnam 1965-1968* by John T. Smith and *Gradual Failure: The Air War Over North Vietnam: 1965-1966* by Jacob van Staaveren comprehensively describe the tensions, conflicts, and complexities that Olds faced as a fighter wing commander. For the details surrounding Operation Bolo itself, a few other books and journal articles provide significant research material that focuses on the leadership and planning perspectives surrounding the operation. These include: *Wolfpack: Hunting MiGs Over Vietnam* by Jerry Scutts, *Aces in Command: Fighter Pilots as Combat Leaders* by Robert Boyne, and "William W. Momyer: A Biography of an Airpower Mind," by Case Cunningham, which includes perspectives within the *administrative system*.

To better understand how current and future USAF leaders can apply the concepts found within CLT to their own units, this monograph will analyze the Doolittle Raid and Operation Bolo, two successful and highly innovative historical airpower case studies. By looking through the lens of CLT, this research will prove that both leaders were able to effectively create *adaptive space* between their tactical planning teams and the operational hierarchy above them. Because CLT scholarship did not exist during World War II or Vietnam, this paper will present a new

perspective to analyze successful innovative USAF leadership from the past to uncover lessons for future application.

Section 2: Complexity Leadership Theory

Complexity Leadership Theory (CLT) is a newer field of leadership research grounded in complexity science, organizational theory, and traditional leadership research. CLT seeks to more accurately reflect the complexity of organizational leadership as it occurs in practice. CLT takes a holistic view of the role of leadership within complex organizations to understand the dynamic, distributed, and hierarchical contexts of leadership.¹¹ As described by Uhl-Bien, Marion and McKelvey, CLT “enables the learning, creative, and adaptive capacity of a complex adaptive system (CAS) in knowledge-producing organizations.”¹² They define a CAS as a formal or informal network of interacting and interdependent agents who come together through a cooperative dynamic that focuses on a unifying goal, objective, or need.¹³ CASs are changeable or malleable structures that involve multiple overlapping hierarchies.

In contrast to CASs, most modern organizations are less-adaptive complex systems, specifically structured for efficiency and control.¹⁴ Hierarchical bureaucratic systems sacrifice a certain level of adaptability to achieve higher levels of predictable functionality and consistent output by adopting a more rigid structure. Bureaucracies often value efficiency, predictability, and order over the more unpredictable structures and outcomes that result from a less-regulated bottom-up approach. The natural tendency for leaders and managers to institute top-down

¹¹ Mary Uhl-Bien and Russ Marion, “Complexity Leadership in Bureaucratic Forms of Organizing: A Meso Model,” *The Leadership Quarterly* 20, no. 4 (August 2009): 631.

¹² Uhl-Bien, Marion and McKelvey, “Complexity Leadership Theory: Shifting Leadership from the Industrial Age to the Knowledge Era,” 299.

¹³ *Ibid.*, 302.

¹⁴ Uhl-Bien and Arena, “Leadership for Organizational Adaptability: A Theoretical Synthesis and Integrative Framework,” 96.

bureaucratic processes stymies emergent growth, innovation, and networking. Instead, hierarchical systems often create obstacles to the interconnectivity required for bottom-up actions to produce emergent phenomena.¹⁵

Most organizations today structure themselves with these bureaucratic principles in mind, so in turn, most organizational leadership research focuses on direct, top-down bureaucratic leadership within the complex system framework.¹⁶ Thus, most current research in leadership theory remains grounded within the bureaucratic organizational framework and focuses on leadership and management techniques that operate within that formal structure. To contrast, CLT focuses on the emergent and interactive leadership dynamics that facilitate adaptive outcomes within complex systems.¹⁷ CLT attempts to describe how leadership can promote creativity, innovation, and adaptation within complex yet hierarchical organizations. Essentially, how can leaders in today's information age enable the *emergence* of new solutions and innovation within a bureaucratic system so that it becomes an adaptive organization?¹⁸

Almost all organizations have two semi-formal systems or levels of action that naturally produce a certain level of tension between each other. The *entrepreneurial system* generates ideas, innovations, new products, and new methods. At the other end, the *administrative system* is responsible for aligning the products, ideas, and methods with organizational needs, and then executing them. CLT has discovered that successful *adaptive organizations*, like CASs, have a distinct advantage because they are skilled at enabling *adaptive space* between the two systems. The *adaptive space* exists in the interface between the two systems and embraces, rather than

¹⁵ Michael Arena and Mary Uhl-Bien, "Complexity Leadership Theory: Shifting from Human Capital to Social Capital," *People and Strategy* 39, no. 2 (Spring 2016): 23.

¹⁶ Uhl-Bien and Marion, "Complexity Leadership in Bureaucratic Forms of Organizing: A Meso Model," 632-633.

¹⁷ Uhl-Bien, Marion and McKelvey, "Complexity Leadership Theory: Shifting Leadership from the Industrial Age to the Knowledge Era," 301.

¹⁸ Arena and Uhl-Bien, "Complexity Leadership Theory: Shifting from Human Capital to Social Capital," 23.

stifles the natural conflicts between the two. CLT is the only leadership field that identifies the three different types of organizational leadership that exist within the three different systems or spaces described above: *entrepreneurial leadership*, *enabling leadership*, and *administrative leadership*.¹⁹ (See Figure 1.)

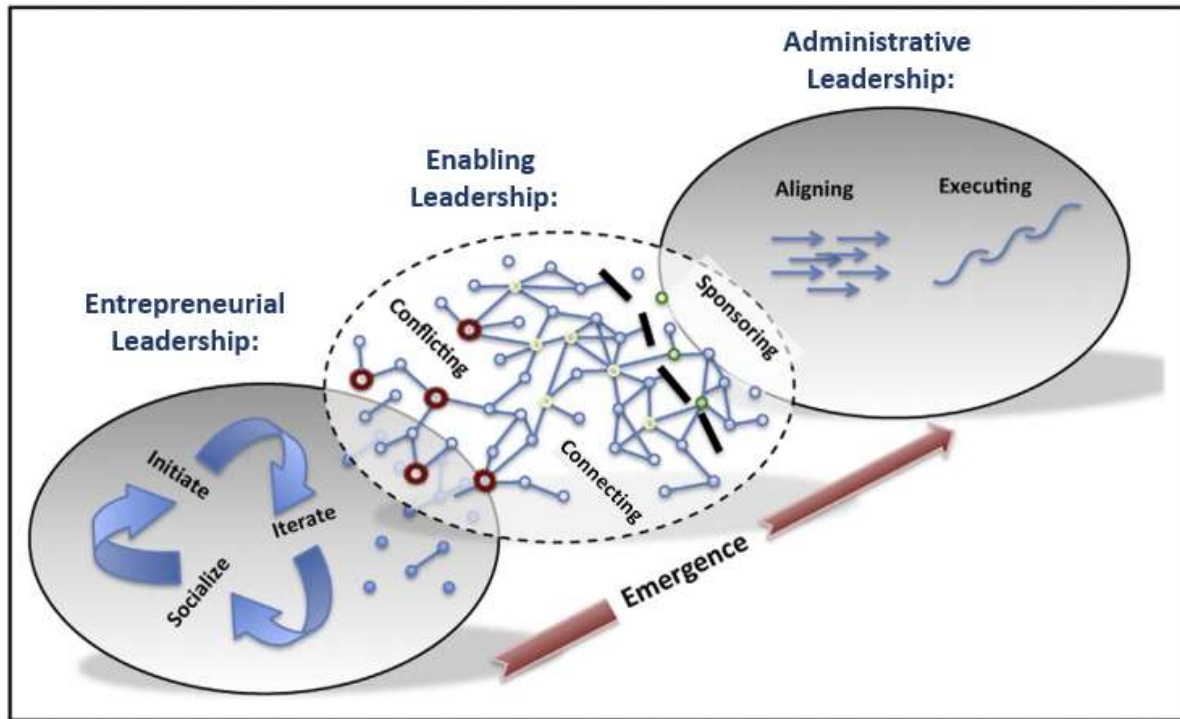


Figure 1. Complexity Leadership Behaviors. Mary Uhl-Bien, *Complexity Leadership Theory*. Electronic presentation provided electronically to the US Army School of Advanced Military Studies in January, 2016, 25; Mary Uhl-Bien, and Michael Arena, “Complexity Leadership: Enabling People and Organizations for Adaptability,” *Organizational Dynamics*: (2017), 7.

Entrepreneurial leadership refers to the actions that help facilitate the creation and development of new knowledge, products, and methods that help an organization adapt to pressures, realize opportunities, and maintain viability.²⁰ *Entrepreneurial leaders* understand the organizational demands (as described to them by the *administrative leadership*), are skilled in

¹⁹ Uhl-Bien and Arena, “Leadership for Organizational Adaptability: A Theoretical Synthesis and Integrative Framework,” 98; See Footnote #3 (administrative vs operational).

²⁰ Ibid.

brokering ideas between work groups, and have a bias towards action. They build trust and know how to bring diverse groups of people and ideas together. They also thrive in environments with broad guidance, limited resources, and flexibility of action.²¹ Although *entrepreneurial leadership* usually refers to leadership at the less formal, lower levels, organizations can have *entrepreneurial leaders* at any level. However, because most leaders at the upper levels of traditional hierarchical bureaucracies oversee the more formal administrative functions of the organization, *entrepreneurial leaders* usually reside entirely within the *entrepreneurial system*.²²

Administrative leadership is the managerial form of leadership that addresses the bureaucratic functions within the organization.²³ In complexity, most organizations still have the need to organize in ways that generate efficiency and produce predictable, ongoing results. Although *administrative leaders* recognize the needs for innovation and adaptability, they must balance those needs with the need to produce. One of the keys to innovation, according to CLT, is the natural tension that *administrative leaders* input into the *adaptive space* between the *entrepreneurial system* and the *administrative system*. Good *administrative leaders* place the right amount of constraints into the production/planning process, so the *entrepreneurial system* can understand the operational needs of the organization, but still allow for sufficient flexibility to create and innovate.²⁴ An organization with too many constraints stifles creative energy. However, an organization with insufficient constraints and controls may struggle to focus innovation to meet its organizational requirements.

²¹ Uhl-Bien, Mary and Michael Arena, “Complexity Leadership: Enabling People and Organizations for Adaptability,” *Organizational Dynamics* (2017): 8.

²² Uhl-Bien and Arena, “Leadership for Organizational Adaptability: A Theoretical Synthesis and Integrative Framework,” 98.

²³ Uhl-Bien, Marion and McKelvey, “Complexity Leadership Theory: Shifting Leadership from the Industrial Age to the Knowledge Era,” 301.

²⁴ Uhl-Bien and Arena, “Complexity Leadership: Enabling People and Organizations for Adaptability,” 7.

Enabling leadership is the key leadership role within the CLT framework. *Enabling leadership* operates in the *adaptive space* between the *entrepreneurial system* and the *administrative system* in a bureaucratic organization. An *enabling leader* helps to create the *adaptive space* required to leverage the networks in the organization to bring disparate ideas and solutions together to help facilitate executable innovation and change. These leaders use their connections and interpersonal relationships to nurture the *emergence* of adaptive responses within the complex system. They also protect the *adaptive space* because they recognize its importance to nurturing and sustaining the organization's adaptive and innovative processes.²⁵ *Enabling leaders* thrive in the tension, conflict, ambiguity, and stress inherent within the *adaptive space*. They are familiar with the demands of the *administrative system* but respect the creative needs of the *entrepreneurial system*. These leaders must gain the trust of the *administrative leadership* to help match the *emergent* ideas to the demands of the organization and find sponsors within the *administrative system* to then finally execute them. On the other hand, they must trust the *entrepreneurial leaders* while sheltering them from unnecessary demands or constraints from above.²⁶ See Figure 2.

²⁵ Uhl-Bien and Arena, "Leadership for Organizational Adaptability: A Theoretical Synthesis and Integrative Framework," 98.

²⁶ *Ibid.*, 99.

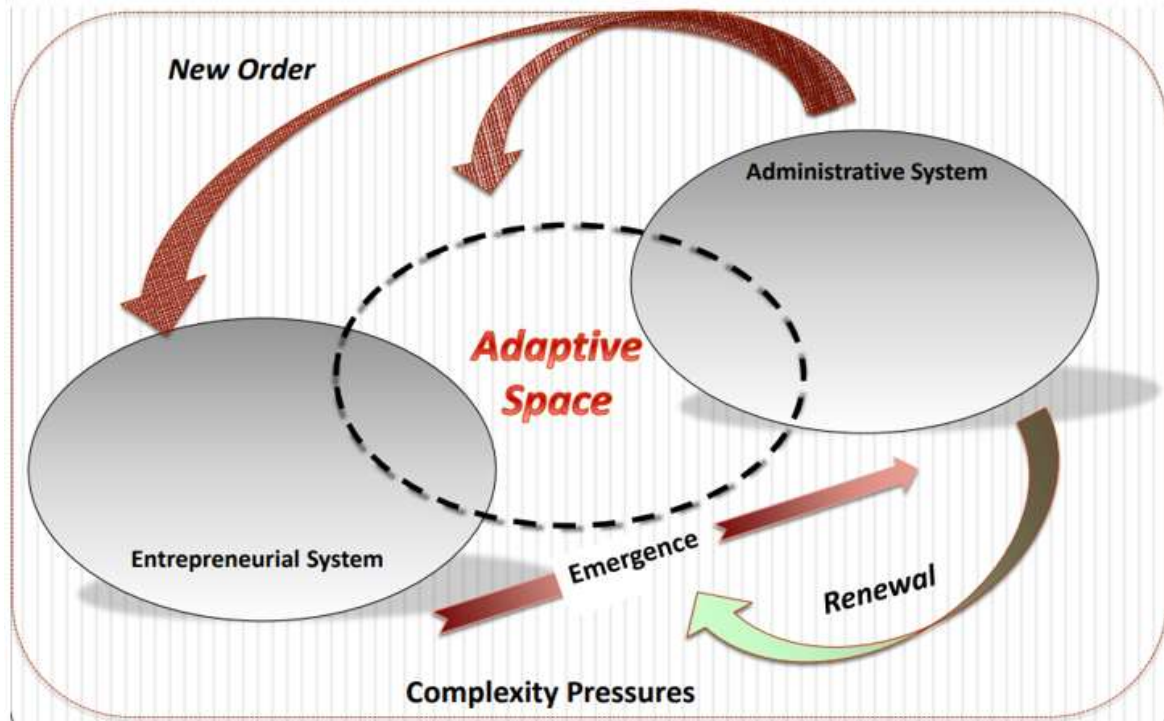


Figure 2. Organization as a Complex Adaptive System with Adaptive Space. Mary Uhl-Bien, *Complexity Leadership Theory*, electronic presentation provided electronically to the US Army School of Advanced Military Studies in January, 2016, 20.

The *adaptive space* allows “for ideas to be more readily introduced, more openly shared and more effectively integrated into formal processes...*adaptive space*, therefore is essential in helping organizations become and remain adaptive.”²⁷ *Enabling leaders* enable *adaptive space* within their organization and jealously protect that *adaptive space* to allow for *emergence*.

Enabling leaders do this through what Uhl-Bien and Arena define as *conflicting* and *connecting*.

Conflicting engages the tensions inherent with the top-down need to produce (organizational requirements) and the bottom-up pressures to innovate and adapt. Leaders engage in *conflicting* in two major ways. First, they enable diverse agents and groups to get together and develop solutions to resolve tensions, share ideas, brainstorm, or network. *Adaptive spaces* can be

²⁷ Arena and Uhl-Bien, “Complexity Leadership Theory: Shifting from Human Capital to Social Capital,” 24.

physical or virtual meeting spaces, or even just dedicated time (calendar space). Secondly, leaders engage in *conflicting* through delicately balancing the pressures and tensions that the *entrepreneurial* agents feel. The *enabling leader* must understand the tensions within each system to either shelter (bear the burden himself) agents from the tension or inject tension into the environment if required for motivation. This requires a climate of trust and support, which is essential to prevent the system from stifling *emergence* yet keep linkages open and agents energized and productive.²⁸

Connecting involves keeping information and idea flows open through linking agents in ways that allow for new processes and innovations to flow through both systems with minimal resistance. *Connecting* enables the rich interconnectivity (complexity) that systems need to become adaptive. *Enabling leaders* help promote novelty and innovation by using networking and brokering to facilitate sharing ideas across different smaller groups and diverse networks, which in turn allows for those groups to team up around these new ideas. They also help link feasible innovations and adaptations to sponsor agents within the *administrative system*. Sponsors are necessary to align new ideas to match organizational needs, allocate resources, and finally execute them.²⁹

CLT explains how leaders within a hierarchical bureaucratic organization can help facilitate adaptability and emergence, even within a hierarchical system. It brings together perspectives from a wide range of intellectual disciplines including strategy, organizational theory, creativity, complexity, systems, and leadership and integrates them into a useful framework to understand the different leadership roles that facilitate an organization's adaptive processes.³⁰ This theory illuminates the actions that leaders at all levels within a bureaucratic

²⁸ Uhl-Bien and Arena, "Leadership for Organizational Adaptability: A Theoretical Synthesis and Integrative Framework," 99.

²⁹ Ibid., 100.

³⁰ Ibid., 89-90.

organization must take to maximize the human capital within their ordered system. The new research in CLT has potential applicability in a wide range of institutions that have some level of complex hierarchical organization, including all branches of the military.³¹

Hierarchical bureaucracies like the military are structurally ill-suited to deal with highly complex problems, so adaptation is essential for success and even survival during war.³² This highlights the imperative for organizations like the USAF to create and foster *emergence* despite the bureaucracy. To do this, the USAF must empower *entrepreneurial leaders* to network, create, and innovate; encourage *administrative leaders* set expectations, but take a hands-off approach; and trust *enabling leaders* to create the *adaptive space* necessary to match emergent novelty with administrative demands.³³ CLT not only offers a theory to describe process of *emergence* and adaptation within complex organizations, but offers a framework to conceptualize both the leadership responsibilities and the structure of an adaptive bureaucratic organization.³⁴

Using CLT as a lens to view the leadership interactions and planning processes, the following case studies illustrate two US Air Force(s) examples of successful *enabling leadership* during wartime. These two case studies discuss real-world complex USAF problems in complex operational environments. To “bring to life” the concepts of CLT, this monograph will demonstrate how each operational leader embodied the characteristics and traits of an *enabling leader*, as described in current CLT research.

³¹ Yaneeer Bar-Yam, *Making Things Work: Solving Complex Problems in a Complex World* (Cambridge, MA: NECSI Knowledge Press, 2004), 16-18.

³² *Ibid.*, 104.

³³ Michael J. Arena, et al., “How to Catalyze Innovation in Your Organization,” *MIT Sloan Management Review* 58, no. 4 (Summer 2017): 45-46.

³⁴ Uhl-Bien and Arena, “Leadership for Organizational Adaptability: A Theoretical Synthesis and Integrative Framework,” 101.

Section 3: The Doolittle Raid

Background

In the wake the German Military victories in 1939-1940 in Poland, Holland, Belgium, and France, President Franklin D. Roosevelt began the complicated process of easing the US military back towards a wartime posture. After declaring a national state of emergency and proclaiming that the United States would become an “arsenal of democracy,” Roosevelt began preparing for the inevitable war.³⁵ In late 1940, Roosevelt initiated his “Roosevelt Doctrine,” proposing a lend-lease bill designed to help supply European allies with war material and at the same time keep the United States out of a European war. Lend-lease constituted the first major step towards war, as it shed any existing pretense of American neutrality.³⁶ Aviation companies received orders to expand existing plants and increase production of military aircraft, with the goal of producing at least 50,000 planes a year. At the same time, the Navy increased production, the president initiated the first peace-time draft, and Maj James H. Doolittle got a recall notice to return to active duty as the Army Air Corps representative to the Allison Aircraft Production Plant.³⁷

As the United States prepared for a potential war against Nazi Germany, relations with Japan continued to sour. Apart from their stalled war against China and border conflicts with the Soviet Union, Japan further threatened US interests in the Pacific region. In response, the Roosevelt government instituted sanctions against Japan in late 1940, which led to Japan entering a Tripartite Pact with Germany and Italy. Further Japanese aggression in the southern Pacific led the United States to institute tighter sanctions, including a *de facto* oil embargo in the summer of

³⁵ James Harold Doolittle and Carroll V. Glines, *I Could Never Be So Lucky Again: An Autobiography* (New York: Bantam Books, 1991), 213.

³⁶ George C. Herring, *From Colony to Superpower, US Foreign Relations Since 1776* (New York: Oxford University Press, 2008), 524-525.

³⁷ Doolittle and Glines, *I Could Never Be So Lucky Again: An Autobiography*, 213.

1941. By the fall, the US was still in the initial stages of mobilizing for war and faced the possibility of conflict on two separate fronts. War arrived on December 7, 1941 when the Japanese launched a surprise carrier attack on Pearl Harbor, Hawaii. Germany followed suit and declared war on the United States four days later. By December 11, 1941, the United States was at war in both the Pacific and European theaters.³⁸

Two weeks after the surprise attack by the Japanese, Roosevelt met with top military leaders from each service to emphasize the need to respond in kind with a bombing raid on the home islands of Japan. Roosevelt felt an attack on Japan was necessary to bolster the morale of the American public and force Japan to recall some of its force to maintain better defense of its homeland.³⁹ At the time, aircraft from the US Army Air Forces (USAAF) operating out of China seemed to be the only real option to take the fight to Japan. However, there were no long- or medium-range bombers in China and it was going to take months or longer to get enough bombers to China for an attack.⁴⁰

In just two years, the United States had gone from a period of neutrality and isolationism, to being at war on two fronts against two modern post-industrial militaries.⁴¹ Modern inventions such as high-speed combat aircraft, long-range bombers, aircraft carriers, high-speed armored tanks, and radars were new additions to the battlefield. The area of operations literally spanned almost the entire globe. The WWII operational environment was more complex than any previous war. The US military was still in the midst of a period of modernization, growth, and reorganization. Thousands of young Americans volunteered or were drafted into the US military, filling the ranks of skeleton units as they built up, trained, and eventually deployed. At the same

³⁸ Herring, *From Colony to Superpower, US Foreign Relations Since 1776*, 533-535.

³⁹ Doolittle and Glines, *I Could Never Be So Lucky Again: An Autobiography*, 230-231.

⁴⁰ James M. Scott, *Target Tokyo: Jimmy Doolittle and the Raid that Avenged Pearl Harbor* (New York: W. W. Norton, 2015), 27, 34.

⁴¹ Herring, *From Colony to Superpower, US Foreign Relations Since 1776*, 536-537.

time, Roosevelt's sense of urgency called for immediate action. The Chief of Staff of the USAAF, General Henry H. Arnold, directed the War Plans Division of the Air Staff to begin drafting plans for a retaliatory attack.⁴² Thus, the complex hierarchical bureaucracies of both the USAAF, and the US Navy (USN) had a mission, and very broad guidance from their *administrative leadership*. The constraints necessary for tension created *adaptive space* as a concrete plan began to form.

Enabling Leadership Actions

The initial idea to use USAAF medium bombers launched from a USN aircraft carrier to bomb Tokyo did not come from the USAAF, but from the USN. It originated from Captain Francis Low, a submarine officer in the USN, who got the idea from watching planes takeoff from a runway with an aircraft carrier deck painted on it in Norfolk, Virginia. After presenting his idea to USN leadership, Captain Donald Duncan soon determined that the idea was feasible and merited further planning.⁴³ Although the *entrepreneurial* idea was not newly-promoted Lt Col Jimmy Doolittle's, he was the officer assigned by Arnold to take the lead of the top-secret, joint-service project. The idea was in its infancy, but Arnold and the other *administrative leaders* had trust in Doolittle and gave him top priority over all other projects at the time. "The selection of Doolittle to lead this nearly suicidal mission was a natural one," said Arnold, in retrospect. "He was fearless, technically brilliant...a leader who not only could be counted upon to do a task himself if it were humanly possible but could impart that spirit to others."⁴⁴ Doolittle had the perfect combination of aviation expertise, combat experience, leadership ability, and personal

⁴² Carroll V. Glines, *The Doolittle Raid: America's First Daring Strike Against Japan* (New York: Orion Books, 1988), 10.

⁴³ Carroll V. Glines, *Doolittle's Tokyo Raiders* (New York: D. Van Nostrand Reinhold Company, 1964), 13-16.

⁴⁴ Kevin McHugh, "Navigating from Shangri-La: Cincinnati's Doolittle Raider at War," *Queen City Heritage* (Winter 1992): 5.

charisma to oversee the difficult project and *enable* an entire network of officers, sailors, airmen, and civilians to work together.⁴⁵

Arnold considered Doolittle, who was known as the “master of the calculated risk,” to be one of his “irreplaceable” air officers.⁴⁶ Besides his experience as a combat pilot during World War I, Doolittle made a name for himself after the war in the Air Corps by winning nearly every national aviation competition and innovation trophy, including some of them twice.⁴⁷ Best known for his flying abilities, Doolittle was also highly educated and a pioneer in aerospace research. He earned a doctorate in aeronautical engineering from the Massachusetts Institute of Technology and was well respected for his research projects in aviation. Doolittle’s experience in the civilian aviation industry during the 1930’s would prove invaluable for the project. During a time of rapid growth, design, and innovation in the field of aviation, Doolittle was one of the most influential experts in the field. Arnold knew that Doolittle’s ingenuity was just the type he would need for the mission.⁴⁸

Doolittle’s appointment as the lead for the top-secret project designed to use *emergent* tactics and innovative planning to launch an attack on Tokyo put him in the *enabling leadership* position. After assigning Doolittle the project, Arnold proceeded with filling in the details and constraints. Doolittle’s team needed to find an aircraft that could take off in as little as 500 feet, carry a payload of at least 2,000 pounds, and fly 2,000+ miles to complete the mission. To increase the tension even more, they set the tentative departure date from California for April 1, 1942, just a few months away.⁴⁹ Finally, to surprise Japan and get a carrier close enough to

⁴⁵ Benjamin W. Bishop, “Jimmy Doolittle, the Commander Behind the Legend,” *The Drew Papers*, No. 17, Maxwell AFB, AL: Air University Press, 2016, 19-20.

⁴⁶ Glines, *Doolittle’s Tokyo Raiders*, 20.

⁴⁷ *Ibid.*, 20-21.

⁴⁸ Bishop, “Jimmy Doolittle, the Commander Behind the Legend,” 19.

⁴⁹ James M. Merrill, *Target Tokyo: The Halsey-Doolittle Raid* (Chicago: Rand McNally, 1964), 22.

launch bombers, secrecy would be key.⁵⁰ These constraints from the *administrative system* would help provide the initial tension for the *entrepreneurial system* to start innovating. Doolittle immediately started to build the *adaptive space* necessary to bridge the gap between the *entrepreneurial* and *administrative systems*.

As Doolittle took the job as project lead, the first milestone was selecting a bomber for the mission. To comply with the constraints, but still fit on an aircraft carrier, Doolittle knew that the B-25B was the only bomber that would work. However, it would require significant modifications to give the aircraft extra gas capacity as well as lighten the overall payload.⁵¹ To assist with the modifications, Doolittle turned to the USAAF engineers at Wright Field in Ohio, professionals with whom he had worked before. Doolittle was familiar with the setup and had a great personal relationship with many of his fellow aerospace engineers. With his guidance, the “miracle workers” at Wright Field soon had plans drawn up that would add 495 gallons of gas, while finding creative ways to decrease aircraft gross weight to make up for the extra fuel capacity.⁵² The engineers headed to Minneapolis, Minnesota, to do the fuel systems upgrades at the Mid-Continent Airlines facilities there.⁵³ In just a few weeks, these “miracle workers” almost completely redesigned the B-25 fuel system, increased storage capacity by 500 gallons, installed motion picture cameras on several aircraft, designed new bomb shackles, and manufactured three specially fitted fuel tanks for the mission.⁵⁴

⁵⁰ Since many people from multiple services and industries would be involved in the project, Doolittle and Arnold developed a cover story for the need to put land-based bombers on a carrier: they would be part of the 10th Air Force buildup in China.; Doolittle and Glines, *I Could Never Be So Lucky Again: An Autobiography*, 236.

⁵¹ *Ibid.*, 235.

⁵² James H. Doolittle, Headquarters, Army Air Forces, Annex I and II, Estimate of the Situation, 15 January 1942, 1; Scott, *Target Tokyo*, 60-61.

⁵³ James H. Doolittle, “B-25 Special Project Memo,” January 1942, Microfilm, 2.

⁵⁴ Doolittle and Glines, *I Could Never Be So Lucky Again: An Autobiography*, 240.

Doolittle was essential in executing the *connecting* actions to bring together the civilian aircraft industry experts, engineers, *administrative leadership*, and the B-25 squadrons. He trusted the industry experts and the engineering team's creativity and innovation skills to make the required upgrades to the aircraft on schedule while he hurried to round up twenty-four B-25Bs to modify for the mission.⁵⁵ Within only a week of assuming his leadership position, Doolittle was *enabling adaptive space* and using the tensions of constraints and timelines to motivate the *entrepreneurial teams* he was building.

USN Captain Duncan had already started working to determine feasibility from the Navy's perspective on the *USS Hornet* at Norfolk Naval Operating Base.⁵⁶ To assist, Doolittle sent three USAAF B-25B crews to Norfolk to assist Duncan with a trial-run on the *Hornet*. Even though he outranked Doolittle, Capt Duncan, who was a career Navy aviator, was happy to play the supporting role in preparation for the raid by leading the USN team efforts. On February 2, under Duncan's supervision, two B-25s successfully took off from the *Hornet* and returned to base. Duncan wrote Admiral King, USN Chief of Staff, to let him know the good news and pass on that he concluded that fifteen to twenty B-25s could fit onboard the ship. Doolittle skillfully avoided what could have been unnecessary tension between the two services by empowering Capt Duncan and kept a hands-off approach to overseeing the USN's sea trials.

The next challenge for Doolittle was to find aircrew for the mission. Since most of the modified B-25s had come from the Seventeenth Bombardment Group in Pendleton, Oregon, Doolittle decided to use aircrew from that group as well. Doolittle knew that the mission would be dangerous, so he wanted volunteer crews only. On February 3, the commander, Lt Col William Mills, got orders from Arnold to transfer his Bombardment Group to Columbia Army Air Base, South Carolina. Mills also received word from Arnold to start asking around for

⁵⁵ Doolittle and Glines, *I Could Never Be So Lucky Again: An Autobiography*, 242.

⁵⁶ Scott, *Target Tokyo*, 64.

volunteers from his four flying squadrons for an extremely dangerous but important mission. The mission required twenty-four B-25 crews to immediately begin top-secret training at a secluded runway on Eglin Field, Florida.⁵⁷ When all his squadrons arrived in Columbia after picking up their specially-modified B-25s in Minneapolis, Mills was surprised to see that every single aircrew member in all four squadrons had volunteered. Once the entire group had arrived in Columbia, Mills selected twenty-four of his best crews, including Major Jack Hilger, the commander of the Eighty-ninth squadron to serve as Doolittle's deputy for the mission.⁵⁸ Hilger gathered the crews, ground support, and modified bombers and made his way down to Eglin the last week of February to begin training for their dangerous and mysterious mission.⁵⁹

By allowing Mills to select the best crews, Doolittle demonstrated his trust of both Mills and the B-25 crews, as well as his willingness to keep a hands-off approach with as much of the process as possible to allow for *connecting*, aggregation, and networking to happen. Doolittle Raid pilot, Ted Lawson, provided evidence of this in his first-hand account *Thirty Seconds Over Tokyo*. "I picked up a new crew in Columbia...Dean Davenport...as my co-pilot. I liked the way he flew. We added...McClure...as our navigator and...Clever...as bombardier. Our gunner-engineer became...Thatcher...he was only nineteen, but quiet and industrious...Without realizing it, I had picked my crew for the Tokyo trip."⁶⁰ Essentially, Doolittle gave the crews room to adapt and organize as needed to maximize their skills, abilities, and ideas.

To train his crews for this unprecedented mission, Doolittle realized that he would need some emergent techniques as well as some aircraft carrier expertise. To assist with the task, Doolittle asked for a naval flight instructor from Pensacola Naval Air Station to report to Eglin to help teach the USAAF crews to take off from a carrier without having a real carrier to use.

⁵⁷ Glines, *The Doolittle Raid*, 28.

⁵⁸ Doolittle and Glines, *I Could Never Be So Lucky Again: An Autobiography*, 242-243.

⁵⁹ Ted Lawson, *Thirty Seconds Over Tokyo*, (New York: Pocket Star Books, 2002), 24-27.

⁶⁰ *Ibid.*, 24-25.

Although USN Lieutenant Miller had never flown a B-25, he learned quickly and with the help of some of the more senior USAAF instructors began to establish standardized takeoff procedures that would minimize takeoff roll and maximize lift. After many trial runs on the auxiliary field (they had placed flags every 100 feet to judge takeoff distance), they finally settled on new *emergent* techniques for takeoff, including the specifics for flap settings, engine setting, stabilizer position, and execution technique for the other pilots to follow.⁶¹

The crews practiced simulated carrier takeoffs, low level bombing, navigation, night formation flying, air-to-air gunnery, and air-to-ground gunnery to give the crews training in conditions similar to their attack on Tokyo.⁶² Due to the danger of the mission, Doolittle decided to remove the new, highly-classified Norden bombsight from the planes to prevent it from falling into enemy hands. To complicate issues further, gunnery practice uncovered maintenance issues with the upper and lower turret guns, which were unreliable, heavy, tough to fire, and jammed easily. Both issues applied the appropriate level of tension to motivate the aircrews to find new and innovative techniques, material fixes, and work-arounds. Doolittle gave the crews the *adaptive space* needed to solve these issues.

Armed with Doolittle's guidance, Captain Ross Greening proved to be an *entrepreneurial leader*. He helped to design a brand-new bombsight out of \$0.20 worth of scrap aluminum that was more accurate than the Norden sight at low level.⁶³ He also formed a team to solve the gun issues. Since the operational plan called for a low-level ingress, Greening removed the lower turret guns to free up more space for the new sixty-gallon fuel tank. He removed the unreliable tail gun as well. To keep Japanese fighters away from the aft section of the plane, Greening and his team developed the perfect ruse: they painted wooden broomsticks black and installed them where the now-removed tail-gun barrels had been. This saved both weight and the requirement to

⁶¹ Henry L. Miller, "Doolittle Tokyo Raid Narrative and Training Report," March 3-23, 1942, 1-2.

⁶² Scott, *Target Tokyo*, 91-95.

⁶³ Doolittle and Glines, *I Could Never Be So Lucky Again: An Autobiography*, 246.

man that position, yet still served to keep enemy aircraft at bay.⁶⁴ *Entrepreneurial leaders* like Greening understood the importance of the mission, had Doolittle's trust, and used their limited resources to solve problems.

On March 23, after the end of their third week at Eglin Field, Doolittle received a coded wire from Admiral King that the *USS Hornet* had passed through the Panama Canal and was nearing San Francisco Harbor: "TELL JIMMY TO GET ON HIS HORSE."⁶⁵ The time had come for Doolittle's special unit to pack up and fly out to California for final inspections at McClelland Field, then loading onto the *Hornet*. As Doolittle's unit headed to California, the USN finalized plans for the sixteen-ship naval task force that would escort the *Hornet* as they penetrated the Japanese-controlled Pacific.⁶⁶

Once at McClelland, Doolittle planned to have local civilian maintenance personnel perform several last-minute modifications including installing back-type parachute seats, new propellers, a leak-proof cover for a modified gas tank, and new hydraulic valves. He also had them remove the heavy liaison radio and install a better glass navigation window. The stop at McClelland became a source of friction because the maintenance crews there did not understand the importance of their role in the highly-classified mission, so they carried out their modifications and inspections at a leisurely pace. Although Doolittle had warned them against changing any engine settings or messing with the aircrafts' post-production modifications, they reverted to their standard practices and settings, potentially risking mission safety by changing the fine-tuned takeoff modifications perfected at Eglin.⁶⁷

⁶⁴ Scott, *Target Tokyo*, 92-93.

⁶⁵ Glines, *The Doolittle Raid*, 37.

⁶⁶ *Ibid.*, 38-40.

⁶⁷ *Ibid.*, 41-42.

Part of the *entrepreneurial system*, these maintenance personnel did not know the importance of their mission.⁶⁸ Doolittle engaged in a two-pronged game plan to fix the situation: he contacted Arnold to provide top-down pressure through their chain of command, while he engaged the maintainers in person. He used his personal charisma to motivate them while ordering his aircrew to engage and supervise as well. By *connecting* the McClelland maintenance personnel to the importance of the mission and providing the right amount of *conflict* (through time constraints and supervision), inspections sped up and Doolittle's aircrew observed better quality of work from everyone.⁶⁹ On the morning of April 1, 1942, twenty-two B-25s flew to Alameda to load onto the *Hornet*. That afternoon, navy crews hoisted sixteen of the bombers onboard the *Hornet's* deck and Doolittle's crews found their new sleeping quarters for the next three weeks.⁷⁰

Near midday on April 2, 1942, the *Hornet*, along with several other escort ships, sailed out of the harbor, bound for Japan. As the coast slid out of sight, the ship's skipper, Captain Mitscher announced over the loudspeaker, "This force is bound for Tokyo." Doolittle could hear cheers from all corners of the ship after the captain's announcement.⁷¹ In just over two months, Doolittle had planned one of the most daring and innovative joint Navy/Air Forces operations in history.

⁶⁸ Doolittle, as the *enabling leader*, initially failed to "invite" the maintenance crews at McClelland Field to participate in the *adaptive space*. This became a major source of friction because the maintenance personnel had not been *connected* to the overall mission.

⁶⁹ Doolittle and Glines, *I Could Never Be So Lucky Again: An Autobiography*, 251-253.

⁷⁰ Scott, *Target Tokyo*, 122-125.

⁷¹ Doolittle and Glines, *I Could Never Be So Lucky Again: An Autobiography*, 262.

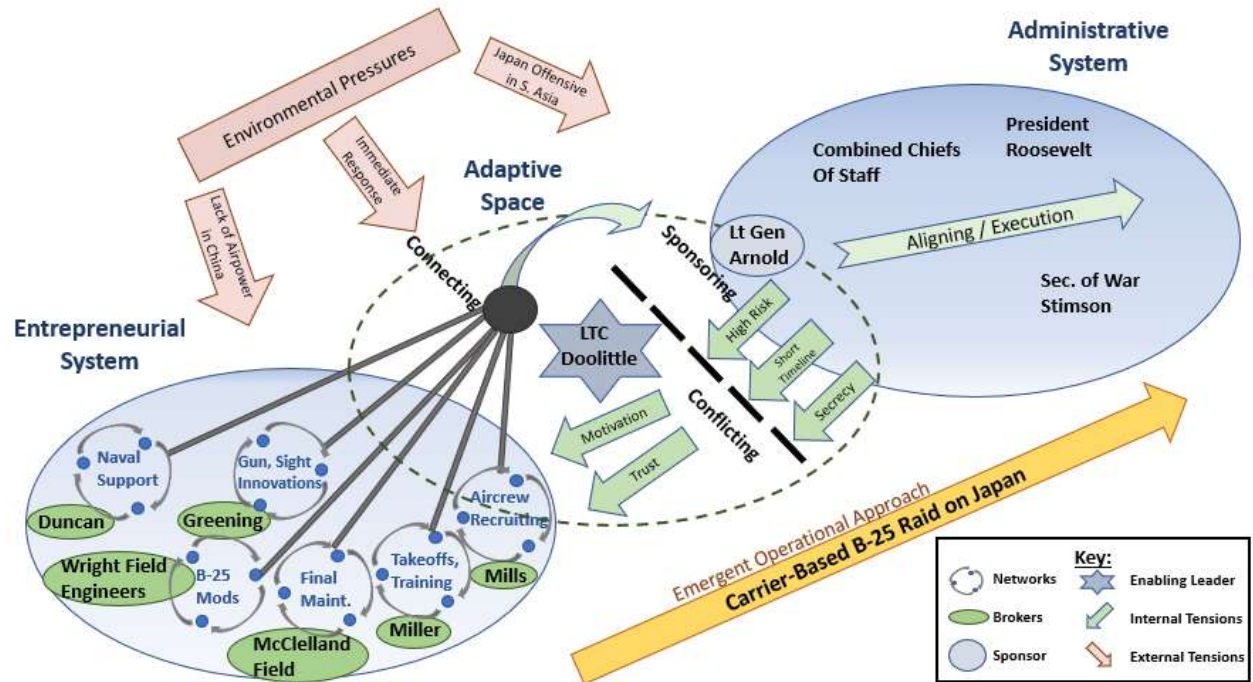


Figure 3. The Doolittle Raid Emergence. Created by author.

Innovative Outcome

At 0300 on April 18, 1942, still 250 miles from their intended launch position, the *USS Hornet* received a message that the *USS Enterprise* spotted two possible enemy boats on its radar. The entire carrier force changed course under the cover of darkness and avoided giving away their location. However, at 0600, a navy scout plane from the *Enterprise* spotted a Japanese surface ship forty-two miles away. Shortly after, other pilots spotted another small vessel within sight of the *Hornet*. The carrier's radio operator intercepted an outgoing Japanese radio message from one of the ships, so Admiral Halsey ordered the *USS Nashville* to sink the boat and told Doolittle's crew to prepare for takeoff. Instead of launching within 500 miles of Japan, they were still 700 miles away. However, Halsey knew they needed to launch immediately to prevent losing the whole fleet to Japanese ships or aircraft.⁷² At 0800, the klaxon horn sounded the battle-

⁷² Scott, *Target Tokyo*, 273-274.

stations alarm and the loudspeaker ordered the flight crews to man their airplanes. Doolittle wouldn't get the nighttime raid that he planned.⁷³

Within an hour, all sixteen bombers onboard took off one by one, led by Doolittle and his crew in the first aircraft. Each plane was easily able to take off from the short carrier deck, thanks to three weeks of practice at Eglin Field, despite the extra fuel and bombs that they carried for the mission. When the crews launched, they were still 600-700 miles from their individual target areas.⁷⁴ With the modifications, they had enough fuel to fly about 2400 miles at low altitude, giving each aircraft very little fuel reserve above the originally-planned 2000-mile flight.⁷⁵

As they took off from the *Hornet* on the morning of the 18th, the weather was overcast and windy. However, as they approached Japan, the weather improved considerably. Navigating by dead-reckoning, they changed course several times during the flight to avoid Japanese vessels and search aircraft, so they were not able to get a precise fix on their location until they saw land.⁷⁶ Doolittle and his crew hit the coast about 80 miles north of Tokyo, then approached from north overland to avoid some of the anti-aircraft batteries along the coast. Other aircrews split off and proceeded to their separate targets. At 1220 local time, Doolittle released four 500-lb incendiary bombs over a factory complex and watched as the bombs scored successful hits below.⁷⁷

All the other aircrews had similar experiences taking off from the *Hornet*, dodging Japanese boats on the ingress, finding the coast, and then hitting their target areas with very little Japanese resistance. All sixteen aircraft successfully made it to Japan and released their bombs

⁷³ Lawson, *Thirty Seconds Over Tokyo*, 6.

⁷⁴ Glines, *The Doolittle Raid*, 69-70.

⁷⁵ Scott, *Target Tokyo*, 58-59.

⁷⁶ Doolittle and Glines, *I Could Never Be So Lucky Again: An Autobiography*, 8-9.

⁷⁷ Glines, *The Doolittle Raid*, 78.

over targets in Tokyo, Yokohama, Nagoya, Kobe, and Osaka.⁷⁸ As they egressed towards their intended landing areas near Chuchow, China, the weather worsened. The bad weather, poor maps, lower-than-planned fuel states, and sunset made it nearly impossible for any of the crews to find their intended landing sites. Thus, all but one of the sixteen B-25 aircrews either bailed-out, crash-landed in China, or ditched just off the coast. The exception was Captain Robert York's crew who was too low on fuel after their bombing raid to even attempt to make a landing in China.⁷⁹ Instead, they turned to the northwest and landed at a small airport near Vladivostok, Soviet Union.⁸⁰ Overall, only three raiders did not survive the day. One died from a secondary fall after parachuting into mountainous territory in China, and two drowned after their bomber ditched in the ocean.⁸¹ Japanese forces in China captured eight others, who became prisoners of war. The Japanese executed three of the eight prisoners and one other died of starvation while in captivity. The remaining four prisoners survived and were repatriated after the war. Soviet forces held the five men who landed near Vladivostok for over thirteen months. The Soviet Union was legally bound to hold the Americans to remain a neutral party with Japan. However, in March of 1943, they were moved to a camp near the Persian border, where Soviet officials "urged" them to "escape." In May 1943, all five airmen crossed the border safely into Persia and made their way to a British consulate.⁸²

When Jimmy Doolittle saw his B-25's crash site the next day, he thought "[the mission] was a failure." Although Doolittle's aircrew had successfully bombed Japan, they failed to deliver

⁷⁸ James M. Scott, "Aftermath: Doolittle's Raid Reexamined," *World War II Magazine*, 30, no.1 (May/June 2015): 59-60.

⁷⁹ Maintenance crews fitted York's plane with two new carburetors at McClelland Field before departure. Those carburetors did not get re-tuned with the specifications that maintenance crews had developed at Eglin Field. The new carburetors were set to burn an excessively rich mixture of fuel, which caused their high burn-rate during the mission. Glines, *Doolittle's Tokyo Raiders*, 212.

⁸⁰ Glines, *Doolittle's Tokyo Raiders*, 200-201, 211-212.

⁸¹ Lawson, *Thirty Seconds Over Tokyo*, 245.

⁸² Glines, *Doolittle's Tokyo Raiders*, 214-216.

any of the B-25 bombers to American units in China, as intended.⁸³ However, the next few weeks, months, and years would reveal that the raid had been extremely successful, tactically and strategically. Tactically, Doolittle's force of sixteen bombers destroyed 112 buildings and damaged fifty-three. They also killed eighty-seven Japanese and wounded 462 others. Of note, the raid damaged several communications, fuel, electrical, and steel production facilities, which had marginal effect on the Japanese war effort. The raid also targeted Yokosuka Naval Base, hitting the sub-tender *Taigei* in dry dock, delaying its conversion to an aircraft carrier by an extra four months.⁸⁴

At the strategic level, the raid was a major shock for the Imperial Navy's General Staff as well as a significant blow to the morale of their country. Embarrassed by a raid over their own homeland, Japanese leadership initially responded with a propaganda campaign to screen the effects of the raid from the public to save face.⁸⁵ Despite the government's best efforts, details of the raid, as well as the visible damage confirmed the Japanese civilian's worst fears: Japan was not invincible, and the Japanese empire was not an impenetrable fortress. To many of the citizens, the "loss of face" from the enemy raid was "worse than death" for the empire. The Japanese high command was embarrassed because the raid endangered the emperor's life under their watch.⁸⁶

Interviews with Japanese officers after the war confirmed the greater strategic effects of the raid. The Doolittle Raid was the catalyst for a change in strategy after the Japanese victories in the Philippines, the Dutch East Indies, and Malaya. The raid demonstrated to Japan that the bombing of Pearl Harbor had not done enough to weaken the USN and caused the Imperial Navy to refocus their efforts to the east towards Midway and the Aleutian Islands. Two weeks later, on May 5, 1942, the Imperial General Headquarters ordered Admiral Yamamoto to "Invade and

⁸³ Doolittle and Glines, *I Could Never Be So Lucky Again: An Autobiography*, 12.

⁸⁴ Scott, "Aftermath: Doolittle's Raid Reexamined," 59-60.

⁸⁵ Glines, *Doolittle's Tokyo Raiders*, 396.

⁸⁶ Glines, *The Doolittle Raid*, 216-217.

occupy Midway Island...to prevent enemy task forces from making attacks against the homeland.”⁸⁷ The Doolittle Raid was the final straw that convinced Japan that they needed to defeat the USN through a decisive engagement at sea. The resulting US victory over Japan at the Battle of Midway would later become the turning point of the war in the Pacific and was an indirect result of Doolittle’s attack on Tokyo.

At home, the Doolittle Raid became a massive morale booster for the American public. The raid showed that the country would fight back against all odds and would make Japan answer for their hostilities at Pearl Harbor. On May 19, 1942, Roosevelt awarded newly-promoted Brigadier General James H. Doolittle with the Medal of Honor for his “conspicuous leadership...and intrepidity,” during the near-suicidal B-25 raid on Japan.⁸⁸ Doolittle’s *enabling leadership* was crucial to the success of the innovative and creative emergent operation known today as the Doolittle Raid.

Section 4: Operation Bolo

Background

In February 1965, President Lyndon B. Johnson made the decision to bomb North Vietnam on a regular basis when he approved *Rolling Thunder*, a limited, progressive campaign of air strikes against military targets in the North, below the nineteenth parallel.⁸⁹ Although the president originally intended for the campaign to last just a few weeks or months, *Rolling Thunder* would continue until November 1, 1968. The objectives of the air campaign were threefold: to send the North a message that they would pay for their actions in the South, to

⁸⁷ Glines, *Doolittle’s Tokyo Raiders*, 393.

⁸⁸ Scott, *Target Tokyo*, 359.

⁸⁹ *Rolling Thunder* strikes were initially limited to south of the nineteenth parallel, but as the campaign dragged on, the line moved further north until it essentially encompassed all of North Vietnam by the summer of 1966, excluding Hanoi, Haiphong Harbor, and a buffer along the Chinese border. John Darrell Sherwood, *Fast Movers: America’s Jet Pilots and the Vietnam Experience* (New York: The Free Press, 1999), xiii.

reduce the flow of men and supplies to the South, and to raise the morale of the people of South Vietnam.⁹⁰ *Rolling Thunder* would be part of a larger combined air, ground, and diplomatic strategy aimed at forcing the Communists in the North to the negotiating table.⁹¹

The decision to increase the intensity of air strikes in North Vietnam reverberated in world capitals as well as the United Nations. *Rolling Thunder* represented a significant escalation of the war and Johnson received criticism both domestically and internationally.⁹² Accordingly, Johnson decided to proceed cautiously with *Rolling Thunder*. As part of his cautious approach, targets had to be nominated by Pacific Command, vetted through an intelligence group at the Joint Chiefs of Staff (JCS), forwarded for approval by the JCS, and finally approved by the president's Tuesday Cabinet each week.⁹³ Not only were targets closely controlled by the civilian leadership, but deployed airmen faced a variety of higher-level operational constraints including the prohibition of attacking enemy airfields, anti-aircraft artillery (AAA) installations, and surface-to-air missile (SAM) batteries, as well as restrictive rules of engagement governing air to air combat once enemy aircraft were airborne.⁹⁴

Other operational constraints restricted where attacking aircraft could fly during their ingress and egress to target areas in the north.⁹⁵ These restrictions effectively created a defined

⁹⁰ John T. Smith, *Rolling Thunder: The Strategic Bombing Campaign, North Vietnam 1965-1968* (St. Paul, MN: Air Research Publications, 1994), 47-49, 338.

⁹¹ Robin Olds, Christina Olds, and Ed Rasimus, *Fighter Pilot: The Memoirs of Legendary Ace Robin Olds* (New York: St Martin's Griffin, 2011), 248.

⁹² Jacob Van Staaveren, *Gradual Failure: The Air War Over North Vietnam: 1965-1966* (Washington, DC: Air Force History and Museums Program, 2002), 89.

⁹³ Tuesday Cabinet: The president's close circle of advisors who met most Tuesdays at noon. The Tuesday Cabinet included the President; the Secretary of Defense, Robert McNamara; the Secretary of State, Dean Rusk; the Under-secretary of State, George Ball; Press Secretary Bill Moyers; Special Advisors McGeorge Bundy and Walt Rostow; CIA Director John McCone, and the Head of the Joint Chiefs of Staff, Maxwell Taylor. Smith, 31, 49.

⁹⁴ Jerry Scutts, *Wolfpack: Hunting MiGs Over Vietnam* (Osceola: Motorbooks International Publishers and Wholesalers Inc.), 1988, 23. and Walter J. Boyne, *Aces in Command: Fighter Pilots as Combat Leaders* (Dulles, VA: Brassey's Inc., 2001), 171.

⁹⁵ *Ibid.*, 9.

“funnel” for US aircraft as they crossed the line to the north. At the same time, the President prohibited the USN from blockading any ports, so while *Rolling Thunder* would eventually cost the North Vietnam over 150 million dollars in supplies and infrastructure, the North could easily replace most items through shipments from the Soviet Union or China, including new SAMs and better Soviet-built fighter jets.⁹⁶ The gradualist approach to an air campaign allowed the North Vietnamese forces time between strikes to recover, rebuild, and improve their defenses. Even when anti-aircraft sites were destroyed, the highly-controlled and complicated targeting process allowed the North Vietnam Air Force (NVAF) enough time and space to move in replacement systems and relocate AAA and SAM systems to prime locations in the “funnel.”⁹⁷ By the summer of 1966, the North Vietnamese had an estimated 4,400 AAA guns and 150 SA-2 SAM batteries set up to protect its urban areas and known US ingress and egress routes.⁹⁸

Just prior to the start of *Rolling Thunder*, the NVAF only owned about 120 aircraft, including only thirty to forty fighters, mostly older MiG-17 “Frescos.”⁹⁹ Due to the limited air threat, but to the consternation of many of the operational level USAF leaders, the campaign plan effectively ceded air superiority over North Vietnam to the enemy from the start. Since *Rolling Thunder* did not threaten NVAF airfields and US fighters could not plan for air superiority missions, NVAF fighters could choose the optimum opportunities to takeoff and harass US strike packages. When they did takeoff, MiGs would either engage the poor-maneuvering F-104s and F-105s prior to the target to get them to jettison their bombs prematurely, or they would attack them unobserved, aided by ground-controlled interception (GCI) radars that could direct them towards

⁹⁶ Soviet-built jets at the time were manufactured by *Mikoyan-Gurevich Design Bureau*, or MiG for short. Boyne, *Aces In Command*, 170-172.

⁹⁷ Boyne, *Aces In Command*, 172.

⁹⁸ Scutts, *Wolfpack: Hunting MiGs Over Vietnam*, 11; Sherwood, *Fast Movers: America's Jet Pilots and the Vietnam Experience*, 2.

⁹⁹ Straaveren, *Gradual Failure: The Air War Over North Vietnam: 1965-1966*, 70.

a rear-quarter entry.¹⁰⁰ As a harbinger of things to come, a month into *Rolling Thunder*, MiG-17s shot down the first two US aircraft of the air campaign.¹⁰¹ In response to the increasing air threat, Robert McNamara authorized USAF F-4s to deploy to the theater to act as air cover for the *Rolling Thunder* strikes. The USAF quickly sent a squadron of F-4s to Udorn, Thailand on April 7, 1965, for a temporary deployment, followed by permanent deployments in November and December, including the Eighth Tactical Fighter Wing (TFW) to Ubon.¹⁰²

The first F-4 “Phantom II” strike fighters entered service in 1963. The new third-generation fighter jet was built to be a joint-service multi-role fighter/interceptor, capable of striking ground-based targets as well as intercepting Cold War era bombers and shooting them down with its new AIM-9 “Sidewinder” heat-seeking missiles or AIM-7 “Sparrow” radar-guided missiles. However, the fighter pilots would find the new missiles to be extremely unreliable, even under ideal conditions, much less during a high-speed engagement with MiGs. Making issues worse, F-4 designers did not include an internal gun for close-range combat.¹⁰³

Very few pilots had much experience in the F-4 since the jet had only been operational for two years. The tactics and training included very little air-to-air maneuvering because the pilots would theoretically rely on the new missiles against less-maneuverable bombers. F-4 pilots were underprepared to face the smaller, more maneuverable MiG-17s with their internal twenty-three and thirty-seven-millimeter guns in close-combat. To complicate issues, by February 1966, the first newer-generation MiG-21 “Fishbed” fighters began arriving in North Vietnam, giving

¹⁰⁰ Roger Boniface, *MiGs Over North Vietnam: The Vietnam People's Air Force in Combat, 1965-75* (Mechanicsburg, PA: Stackpole Books, 2008), 18.

¹⁰¹ Smith, *Rolling Thunder: The Strategic Bombing Campaign, North Vietnam 1965-1968*, 308.

¹⁰² Staaveren, *Gradual Failure: The Air War Over North Vietnam: 1965-1966*, 96; Smith, *Rolling Thunder: The Strategic Bombing Campaign, North Vietnam 1965-1968*, 317.

¹⁰³ Sherwood, *Fast Movers: America's Jet Pilots and the Vietnam Experience*, 16-17.

the NVAF a fighter that was nearly equal to the new American F-4s in air-to-air combat capabilities, including air-to-air missiles.¹⁰⁴

As opposed to World War II, the US entry into the Vietnam War was much more gradual and limited. The limited nature of the air campaign provided a multitude of tensions and constraints imposed by the *administrative system* upon the pilots in the *entrepreneurial system* below the wing level.¹⁰⁵ Top-down constraints, ineffective tactical training practices, and unreliable air-to-air missiles made it more difficult for USAF flying squadrons to effectively accomplish *Rolling Thunder* missions without getting shot down or jettisoning their bombs prior to the target. In July 1966, the combination of MiGs, SAMs, and AAA claimed forty-three American aircraft.¹⁰⁶ F-105s, the workhorse of the bombing campaign, were especially vulnerable, and high-level USAF leadership began projecting that the F-105 may become extinct.¹⁰⁷

The combination of lack of air combat experience in the *entrepreneurial system* with overwhelming bureaucratic constraints from the *administrative system* stifled any innovation or creativity within the complex Vietnam air combat environment. As in most bureaucratic systems, operational leaders sought to reduce complexity with structure and predictability, but those efforts only allowed the NVAF more success in finding and targeting aircraft during *Rolling Thunder*. Aircrew morale plummeted, and missions became more dangerous, fueling the frustrations with the *administrative system*.

¹⁰⁴ Smith, *Rolling Thunder: The Strategic Bombing Campaign, North Vietnam 1965-1968*, 312.

¹⁰⁵ Wing level – approximately equivalent to the Division level in the US Army and US Marine Corps. A wing (Tactical Fighter Wing, for example) is usually the largest USAF level of command stationed together at a single operating base.

¹⁰⁶ Sherwood, *Fast Movers: America's Jet Pilots and the Vietnam Experience*, 2.

¹⁰⁷ Scutts, *Wolfpack: Hunting MiGs Over Vietnam*, 30.

Enabling Leadership Actions

Colonel Robin Olds arrived in Ubon, Thailand on September 30, 1966, amid an escalating ground campaign and a floundering *Rolling Thunder* air campaign in Vietnam. Lieutenant General William Momyer, the Seventh Air Force Commander, hand-selected Olds to take command of the Eighth TFW at Ubon, flying F-4s. Momyer knew that aircrew morale was low and needed someone who could lead from the front, would have the respect of his men, and could make the appropriate changes to turn the tide in the air war over Vietnam.¹⁰⁸

The previous 8th TFW commander, Colonel Joe Wilson, had failed to effectively *connect* himself to the *entrepreneurial system*, and instead remained a part of the *administrative system* during his tenure. Although he was a combat-qualified pilot, he had only flown twelve combat sorties in the thirteen months he was in command. His operations deputy had only flown eighteen combat missions in the same amount of time.¹⁰⁹ Upon his initial inspection of the base and its facilities, Olds realized immediately most personnel were not accustomed to an operational leader who was in touch with the day-to-day operations and the tactical-level frustrations that the pilots experienced. After walking around Ubon for a few days and meeting with the various squadron and group commanders, Olds began to understand the malaise that permeated, affecting not only the pilots, but the combat support personnel too.¹¹⁰

Olds understood that the previous commander had been completely disconnected as a leader and garnered little respect as a combat pilot. The wing's support group personnel did not feel a connection to the combat mission, had friction with the host Thai unit, and many of its facilities were open only during the daytime, despite the 24-hour operations tempo.¹¹¹

¹⁰⁸ Case A. Cunningham, "William W. Momyer: A Biography of an Airpower Mind" (PhD diss., School of Advanced Air and Space Studies, 2013), 223.

¹⁰⁹ Olds, Olds and Rasimus, *Fighter Pilot: The Memoirs of Legendary Ace Robin Olds*, 255.

¹¹⁰ *Ibid.*, 260.

¹¹¹ Boyne, "The Robin Olds Factor," 257.

Immediately, Olds began the process of *connecting* and creating *adaptive space*. After a less than lukewarm reception on his arrival due to closed facilities, Olds ordered the support commander to assign a sergeant to Bangkok to help facilitate inbound arrivals to the wing, welcome them with a wing patch, and begin *connecting* them to the wing's combat mission. Olds always made it a point to connect each shop and section to the mission by getting to know his people and making sure they understood how the parts fit into the whole.¹¹²

The wing's maintenance units were equally disconnected from the combat mission due to a Pentagon-mandated sortie generation test program named "Rapid Roger" that started in August. The objective was to prove that combat units could produce a higher sortie generation rate with fewer aircraft and with unlimited maintenance and supply. Instead, the program increased the risk to pilots and put more strain on maintenance personnel. To fly more sorties as directed, aircraft had to be completely reconfigured for night and day launches, so they often launched with smaller bombloads to facilitate a quicker turn-arounds.¹¹³ Olds could not understand the USAF's sortie rate experiment, "it was a terrible thing to do to a wing in combat!"¹¹⁴ By the end of September, "operationally ready" aircraft in the wing fell from seventy-four percent in August to fifty-five percent two months later. The "unlimited maintenance and supply" promise turned into personnel and part shortages, while the twenty-four-hour surge rate often mandated pilots to fly without a wingman to fulfill assigned missions at a break-neck pace. To keep aircraft available for combat missions, maintenance personnel had to start pulling double shifts.¹¹⁵

The lack of leadership at the tactical level, the pace of maintenance operations under the "Rapid Roger" program, and an increase in combat losses all contributed to the frustrations and low morale in the wing. Within two days, Olds held a wing-wide pilot meeting to begin the

¹¹² Olds, Olds and Rasimus, *Fighter Pilot: The Memoirs of Legendary Ace Robin Olds*, 260.

¹¹³ Sherwood, *Fast Movers: America's Jet Pilots and the Vietnam Experience*, 233.

¹¹⁴ Robin Olds, US Oral History Program, Briefing, K239.0512-222.29, September 1969, 10.

¹¹⁵ Olds, Olds and Rasimus, *Fighter Pilot: The Memoirs of Legendary Ace Robin Olds*, 263-264.

process of building trust among the squadrons and gaining their respect. This step was necessary to facilitate *connecting* actions to find innovative ways to solve the complex problems at hand. He also challenged them, “you are going to teach me, but you’d better teach me good and you’d better teach me fast...soon I’m gonna [sic] be better than all of you, and when I know more about your job than you do, look out.”¹¹⁶ The challenge provided some positive *conflicting* motivation for his fellow aviators. First, it signaled to them that their senior leadership would no longer remain disconnected from the combat mission. Second, it created the *adaptive space* necessary for the wing to improve through *enabling* mutual trust and innovation.

Olds took the same approach with the rest of the wing units. Working day and night, he walked the flight line, talked to the mechanics, stopped by the mess hall, and drove with the motor pool drivers. Before long, he knew everyone by name and signaled that he was there to learn, listen, and help with any problems that they might have. As Olds began flying, he learned quickly from the junior instructors and readily accepted suggestions and constructive criticism. He studied the maps and intelligence reports and questioned the flight leads about their tactics. Olds constantly challenged his pilots to show integrity, admit their mistakes on each flight, and highlight lessons-learned to improve for the next mission.¹¹⁷ “Within weeks, Olds had destroyed the barriers of rank and apathy, while he established communication links to bind the wing’s units together.”¹¹⁸ He also opened up communications between the other fighter wings in Southeast Asia, including the F-105 units that his squadrons often supported during large *Rolling Thunder* strike packages in Route Pack IV, V, and VI.¹¹⁹ Olds set a new standard in October when he

¹¹⁶ Olds, Olds and Rasimus, *Fighter Pilot: The Memoirs of Legendary Ace Robin Olds*, 259.

¹¹⁷ Boyne, *Aces in Command*, 173.

¹¹⁸ *Ibid.*, 174.

¹¹⁹ Route Pack: Short for Route Package. In 1965, a joint Air Force-Navy planning team divided Vietnam into six (later seven) different zones or sectors to allow for aircraft deconfliction between aviators in both services. These zones were known as Route Pack I-VI (VIa and VIb). Route Pack V, VIa and VIb were the furthest north and considered the most dangerous sectors. Staaveren, *Gradual Failure: The Air War Over North Vietnam: 1965-1966*, 209-210.

invited some of the pilots from the other wings to come to Ubon for a face-to-face tactics conference. Not only was Olds *connecting* all the units on base, he found ways to link up the disparate fighter units throughout Southeast Asia.¹²⁰

In November 1966, North Vietnamese MiG fighters began to pick up activity. The dual constraints of gradual air escalation and centralized target selection allowed the NVAF to reinforce the Red River Delta area with more SAMs in the fall of 1966 as well as bolster their MiG forces to over 100 MiGs in the delta alone.¹²¹ MiGs were aggressively attacking US flights from their unthreatened airfields and pursuing strike forces from the delta to as far as the Black River.¹²² Early December proved to be costly for American fighters. On December 2nd, “Black Friday,” the USAF lost five aircraft while the USN lost three, all to SAMs or antiaircraft fire.¹²³ To make matters worse, during the first week of December, MiGs shot down two F-105s and caused nineteen strike aircraft to jettison their bombs prior to their targets.¹²⁴ To counter the increasing radar-guided SAM threat, F-105s began carrying newly-fielded QRC-160 jamming pods to spoof the radars. However, to be effective, the F-105s had to fly at a higher altitude, which would make them more susceptible to MiGs because they could no longer outrun them at low altitude.¹²⁵

Because American aircraft could not target enemy airfields, Olds asked his top pilots to think of creative ways to lure the MiGs into air combat with the F-4s, where they could be shot down. Captain J. B. Stone came to Olds one evening and said, “I think I’ve got a way we can do

¹²⁰ Olds, Olds and Rasimus, *Fighter Pilot: The Memoirs of Legendary Ace Robin Olds*, 268.

¹²¹ Wayne Thompson, *To Hanoi and Back: The USAF and North Vietnam, 1966-1973*, (Washington DC: Air Force Histories and Museums Program, 2000), 40.

¹²² Olds, Olds and Rasimus, *Fighter Pilot: The Memoirs of Legendary Ace Robin Olds*, 268.

¹²³ Boyne, *Aces in Command*, 174.

¹²⁴ Thompson, *To Hanoi and Back: The USAF and North Vietnam, 1966-1973*, 53.

¹²⁵ Boyne, *Aces in Command*, 179; Olds, Olds and Rasimus, *Fighter Pilot: The Memoirs of Legendary Ace Robin Olds*, 268-269.

it.”¹²⁶ Stone’s idea was the genesis of the *emergent* approach used in Operation Bolo. He suggested a plan to disguise a large force of F-4s as unescorted F-105s, complete with the radar-jamming QRC-160 pods. If fooled, the MiGs would likely launch from their airfields and mistakenly attack the F-4s, which would be armed with a full air-to-air combat loadout consisting of radar-guided and heat-seeking missiles. Olds loved the idea but knew it would take a large team effort across the base and among several other fighter wings to succeed. He also needed the buy-in from Momyer, the Seventh Air Force Commander since the plan would require a pause in the “Rapid Roger” sortie generation test.¹²⁷ As the *enabling leader*, Olds took the opportunity to present the *emergent* tactical approach to his boss at a PACAF commanders’ conference on December 12th. Although he was not convinced that night, Momyer thought about the plan and trusted Olds’ judgement and combat leadership. Six days later, Olds received the go-ahead to plan the proposed MiG-sweep for execution between December 26th and January 2nd.¹²⁸

Immediately, Olds put Stone in charge of a team to plan the operation, but Olds remained involved to help guide, motivate, and smooth bureaucratic snags along the way. The next few weeks of mission planning produced an *emergent* tactical approach that was a product of Olds’ *connecting* and *conflicting* as an *enabling* wing commander. The planning and preparation included all the units on Ubon Air Base, several other fighter wings, tanker aircraft, civilian maintenance personnel in the United States, avionics experts for the QRC-160, and transportation to ship the jamming pods to Ubon for use. The result was an around-the-clock effort from many different, but connected teams of professionals, *connected* together by Olds towards a common cause. Within two weeks, the planning team developed an *emergent* tactical game plan that

¹²⁶ Olds, Olds and Rasimus, *Fighter Pilot: The Memoirs of Legendary Ace Robin Olds*, 269.

¹²⁷ Ibid.

¹²⁸ Olds, Oral History, 8-9; Cunningham, “William W. Momyer: A Biography of an Airpower Mind”, 256.

stemmed from Stone's idea within the *entrepreneurial system*. After an initial delay of twenty-four hours for weather issues, Operation Bolo launched on January 2, 1967.¹²⁹

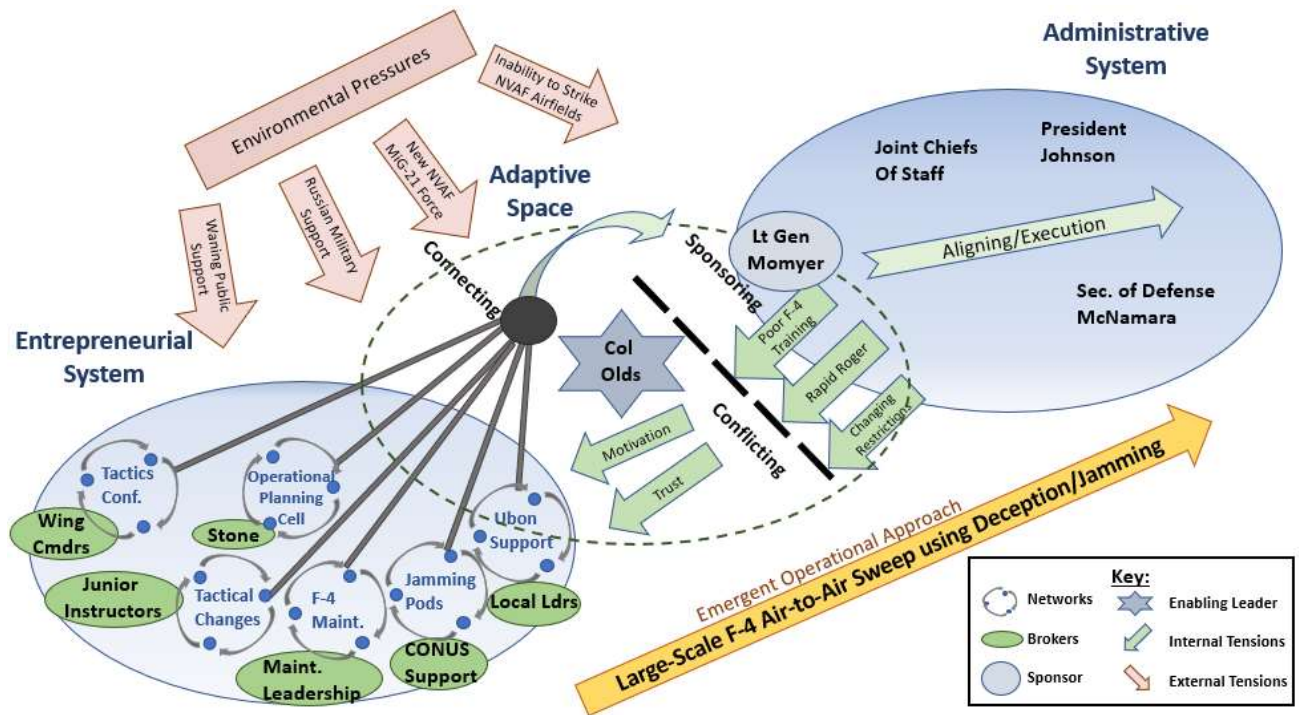


Figure 4. Operation Bolo Emergence. Created by the author.

Innovative Outcome

The success of Operation Bolo hinged on a creative approach toward luring NVAF MiGs into the air by making large flights of air-to-air configured F-4s look like strike packages of the less maneuverable F-105s with the radar-jamming pods on their wings. As the wing commander and *enabling leader*, Olds had the responsibility and privilege of leading the first of nineteen four-ship flights of F-4s. While his wing had the duty to do the main fighter sweep, they had support from the Eighth TFW and the 366th TFW as the east and west blocking forces, designed to keep the MiGs from landing or escaping. Supporting flights of F-104s and F-105Fs provided

¹²⁹ Olds, Olds and Rasimus, *Fighter Pilot: The Memoirs of Legendary Ace Robin Olds*, 279.

suppression of enemy air defenses as well as egress protection.¹³⁰ The plan's design was an *emergent* product of the networking established by Old's leadership at his wing and abroad, including the fighter tactics conferences, new intelligence-sharing practices, open lines of communication between maintenance personnel and pilots, and the many new relationships formed in the process.

In the execution phase, Operation Bolo could not have gone much smoother than it did, despite a few last-minute changes due to high clouds over the delta. As designed, as many as fourteen MiG-21s took the bait and rose above the clouds over their airfields, expecting to engage flights of F-105s, but were ambushed by the waiting F-4s. Olds and six other pilots from his wing each scored a single kill on the day for a total of seven MiG-21s in total.¹³¹ Although the air battle lasted only fifteen minutes total and several MiGs were able to use the cloud cover to escape, Operation Bolo put a significant dent in the NVAF's ability to protect their vital centers with airpower. Intelligence reports at the time estimated that the NVAF only owned thirteen to fourteen MiG-21s in late December 1966.¹³² If that estimate was correct, Olds' pilots cut that number in half in one day, despite the restrictions that disallowed enemy airfield bombing raids.

Operation Bolo's tactical success on January 2nd had both short-term and long-term operational impact across the USAF. First, the mission significantly weakened the enemy's air defenses in one fell swoop. Operation Bolo, combined with another similar smaller-scale mission on January 6th cost the NVAF a total of nine MiG-21s, and effectively limited the MiG-21's role until reinforcements arrived later that summer.¹³³ Secondly, the mission highlighted the F-4s' need for a built-in cannon to provide a backup option for the jet's unreliable missiles. Of the

¹³⁰ Olds, Olds and Rasimus, *Fighter Pilot: The Memoirs of Legendary Ace Robin Olds*, 274-280.

¹³¹ Sherwood, *Fast Movers: America's Jet Pilots and the Vietnam Experience*, 30-31.

¹³² *Ibid.*, 54; Scutts, *Wolfpack: Hunting MiGs Over Vietnam*, 42.

¹³³ Smith, *Rolling Thunder: The Strategic Bombing Campaign, North Vietnam 1965-1968*, 116-117.

twenty missiles that Olds' pilots launched during Bolo, only about half guided toward their intended target, resulting in only seven total kills.¹³⁴ Due to operational demand, and highlighted by Bolo, the USAF fielded a pod-mounted gun in May, 1967.¹³⁵ Finally, Operation Bolo's success was just one product of the monthly tactics conferences that Olds started, aimed at bringing fighter pilots from different units together to communicate lessons learned, share techniques, and accumulate best practices. Those same Vietnam War tactics conferences would eventually lead to the creation of the USAF Weapons School (modeled after Navy's Top Gun) and Red Flag, a realistic USAF flight training program designed to test pilots against realistic enemies before they arrive to a unit in combat.¹³⁶ Both institutions remain a cornerstones of the USAF's fighter training program today.

Section 5: Conclusion

USAF leaders can thrive in today's complex environment if they are able to identify, plan for, and execute courses of action that are innovative, adaptive, and unexpected. New or revolutionary ideas for employing airpower will likely be important factors that can tip the scale against peer or near-peer adversaries. To achieve disproportionate effects against the enemy, operational USAF commanders must be *enabling leaders* who can engage in both *connecting* and *conflicting* actions within the *adaptive space* with their units or planning teams. Then, they must personally help to shepherd the best ideas through approval and execution. Over the last five years, many successful businesses have restructured to decrease bureaucratic hierarchy and have implemented practices designed to promote innovation in the *entrepreneurial system*, *enable adaptive space*, and allow for smooth implementation of emergent ideas within the *administrative*

¹³⁴ Boyne, *Aces in Command*, 184.

¹³⁵ Scutts, *Wolfpack: Hunting MiGs Over Vietnam*, 46.

¹³⁶ Brian Daniel Laslie, "Red Flag: How the Rise of 'Realistic Training' After Vietnam Changed the Air Force's Way of War, 1975-1999" (PhD diss., Kansas State University, 2013), 20-23; Thompson, *To Hanoi and Back: The USAF and North Vietnam, 1966-1973*, 239-240.

system. For reasons of military order and discipline, and command and control, the USAF is unlikely to follow suit and restructure to minimize the bureaucratic barriers to innovation. Thus, USAF operational leaders must find ways to encourage adaptation despite the military hierarchical structure. Both Doolittle and Olds proved that enabling leaders at the operational level can successfully promote and implement innovative solutions to complex problems in an increasingly complex air combat environment.

When Arnold put Doolittle in charge of the top-secret mission to bomb Japan, he inherited an innovative concept from the *entrepreneurial system*, but did not have the *adaptive space* to enable its *emergence*. Doolittle understood that he had to work quickly outside the traditional chain of command to bring the idea to fruition. Doolittle allowed for innovation through leveraging his aviation expertise, connections in the aircraft production business, his trusting leadership style, and his personal relationships within the *administrative system*. His memoirs suggest that he had a deep understanding of the complex problem at hand, along with the inherent risks. This understanding drove his intentional approach towards enabling innovation to help mitigate those risks. The *emergent* outcome, the Doolittle Raid, was an immeasurable strategic success despite the mixed results at the tactical level. The Japanese Navy, by all accounts, had to redesign their strategic approach in the Pacific thanks to the success of Doolittle's team.

From his very first day in command, Olds established himself as an *enabling leader*. Unlike Doolittle, he first had to identify the complex problems that the Eighth TFW faced before he could begin to address them with Operation Bolo. His no-nonsense approach, demand for integrity, ability to connect with people (both higher and lower in the chain of command), and the trust of his senior commanders allowed him to gain a unique perspective on the operational environment, see the problem, and mold his unit into an *adaptive organization*. He understood that the complexity of air combat over Vietnam during *Rolling Thunder* had many factors that were outside the span of control of the aviators themselves. Due to *administrative* constraints,

previous wing commanders struggled to deal with complexity and had done little to *enable* their organization to adapt. However, Olds understood that he needed to build relationships across the established networks, create new relationships and networks, and motivate his Airmen to innovate. Doing so, he created *adaptive space* and demonstrated that Air Force units could learn and adapt to the complex combat situation. One of the emergent outcomes, Operation Bolo, turned the tide in the air war in Vietnam and laid the foundation for future USAF strategic programs designed to foster organizational learning and tactical adaptation.

Doolittle and Olds were both charismatic leaders who had the natural ability to influence their superiors, their subordinates, and other outside agencies and networks. However, while charisma is a desirable trait for *enabling leaders*, it is not an essential requirement for building and maintaining the appropriate *adaptive space* to encourage innovation and adaptation. Beyond their charismatic personalities, both leaders took deliberate steps toward forming relationships, building teams, gaining trust, and empowering action with the brokers in both the *entrepreneurial* and *administrative systems*. They expertly leveraged their knowledge, experience, reputations, and both positional and personal power to build a network of diverse teams all focused on finding solutions to a complex problem. By creating the *adaptive space*, they helped *connect* the diverse networks within *entrepreneurial system*, sheltered them from disruptive friction, and provided the motivation needed to innovate. Their credibility and trust from their commanders then allowed for quick adoption of their emergent operational approaches, which in turn had disproportionate effects within the complex combat environments.

CLT provides a useful perspective for operational USAF leaders to understand and potentially implement as a framework to facilitate interaction at the tactical levels that can produce creative results at the operational and strategic levels. The future of air combat will only get more complex as the world becomes more interconnected. *Enabling leaders* who can create *adaptive space* have the potential to produce novel, emergent results that are much more than just the sum of their parts.

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