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Not Just Lucky: How Patton's Third Army Adapted to Generate Information Advantage, 1944



Spencer L. French, Major, US Army



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Program Description

The Command and General Staff College (CGSC) Art of War Scholar's program offers a small number of competitively select officers a chance to participate in intensive, graduate level seminars and in-depth personal research that focuses primarily on understanding strategy and operational art through modern military history. The purpose of the program is to produce officers with critical thinking skills and an advanced understanding of the art of warfighting. These abilities are honed by reading, researching, thinking, debating and writing about complex issues across the full spectrum of modern warfare, from the lessons of the Russo-Japanese war through continuing operations in Afghanistan and Iraq, while looking ahead to the twenty-first century evolution of the art of war.

Abstract

In August 1944, Patton's Third Army smashed through German defenses in Normandy and broke out in a rapid pursuit across France. Third Army's success was substantially due to its effectiveness at generating operational-level information advantage. Information advantage enabled Third Army to gain and maintain the initiative, anticipate decisions, and extend operational reach. Yet when Third Army activated in England in the Spring of 1944, it possessed neither the information forces nor the staff processes to generate information advantage effectively. This study examines how Patton successfully embedded a unique military culture that encouraged rapid adaptation within Third Army's information forces. Specifically, it explores how Patton's visionary leadership created a sense of organizational urgency, reducing change resistance. It also analyzes how Patton's coalition established robust feedback loops and a culture of self-criticism and experimentation. Finally, it looks at how Patton leveraged diverse expertise to develop devastatingly effective solutions to complex problems. Improvements in Third Army's ability to generate information advantage resulted not from any technological advance or material factor but from a military culture that encouraged adaptation.

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Acronyms

AFHQ	Allied Force Headquarters
AIS	Army Information Service
RI	Radio Intelligence
SHAEF	Supreme Headquarters Allied Expeditionary Force
SIAM	Signal Information and Monitoring
SIS	Signal Intelligence Service
SSC	Signal Service Company

Chapter 1 Introduction

Information is like eggs—the fresher, the better. —Lt. Gen. George S. Patton Jr., *War as I Knew It*

In the summer of 1944, Hitler remained master of western Europe, and the Wehrmacht stood athwart all paths to Berlin. The end to almost five years of bloody conflict seemed nowhere in sight. Despite horrific losses on the eastern front, the Germans were still a force to be reckoned with, possessing substantial material resources and a "potent doctrine of combined arms, decentralized leadership, and small-unit initiative."1 While the US Army had experience in combat against the Germans in North Africa and Italy, the scope of the undertaking in France was qualitatively different, posing wholly new challenges. Many American formations entering the fight in France were new and unbloodied. The Allies planned to use this still relatively inexperienced force to invade fortress Europe. Once the Allies established a foothold in France, the plan earmarked Third US Army, under Lt. Gen. George S. Patton Jr., as an exploitation force that would seize Brittany and the port of Brest. Allied planners intended for the supplies flowing through Brest to fuel a long, systematic campaign across France, which, even if all went well, was forecast to take at least another year to reach the German border.²

Yet this is not what occurred. By early September, only a month after Third Army broke out from Normandy, Paris was liberated and the Allies were on Germany's doorstep. Almost 500,000 German troops were killed, wounded, missing, or captured. Losses to German materiel, particularly permanently installed systems or those lacking mobility, were near total.³ Consistently, from the moment it became operational on 1 August 1944 until it reached the Moselle River in September, Third Army was always one step ahead of the German defenders. By the first week of August, Patton's armored columns were dashing toward Brest in the west, the Loire to the south, and the Seine to the east. Throughout August, Third Army overran unprepared German defenses and outmaneuvered German attempts to counterattack or reform their lines. Despite the challenges posed by immature technology, logistical constraints, a new and challenging operational environment, and a peer enemy, Patton found a way to generate advantage.

Patton derived his success from his dynamic approach to warfare. He sought to seize the initiative, maintain a high operational tempo, and continuously take his following action before the enemy could react to



Figure 1.1. Map of France 1944 showing Third Army Headquarters locations.

Source: Third United States Army, After Action Report Third US Army 1 August 1944–9 May 1945: Volume II, Staff Section Reports, Headquarters Commandant (Regensburg, DE: May 1944), 8, Combined Arms Research Library, World War II Operational Documents.

his previous one. The effect became cumulative as Patton gained a further advantage in each successive decision cycle. Rapid exploitation disintegrated the enemy in-depth while speed compensated for security, allowing Patton to economize his force and concentrate combat power. The means to attain speed in decision-making and speed in execution was information. Patton, therefore, viewed the possession of an information advantage as the means to "rock the enemy back on his heels and prevent him from ever recovering."⁴

Patton created a cohesive and integrated approach. Specifically, he sought to generate what twenty-first century US Army doctrine defines as information advantage, "a condition when a force holds the initiative in terms of relevant actor behavior, situational understanding, and decision-making."⁵ Generating an information advantage over the German forces allowed Third Army to gain and maintain the initiative, manage prudent risk, anticipate decisions, and extend its operational reach. His information advantage approach looked first to understand what the enemy intended to do, thereby enabling Third Army to, in Patton's words, "do it

first."⁶ The approach also sought to deprive the enemy of accurate information or the time to process it while simultaneously enabling friendly decision-making through assured communications and decision-making processes. Finally, the approach attacked the enemy cognitively, employing information to allow rapid maneuver and employing maneuver to generate new opportunities to exploit enemy information.

Yet, the organizations, systems, and processes necessary to execute this vision did not exist in the spring of 1944. Third Army needed to create some of the required capabilities and concepts from scratch. It had to adapt and reorganize other organizations and processes to better support Patton's vision. Spring and early summer 1944 was a period of dynamic change within Third Army. This period of change culminated in the creation of new and unique structures dedicated to managing and applying information and integrating it with other capabilities to "change or maintain perceptions, attitudes, and other elements that drive desired behaviors to support human decision-making."7 By the time it began operation on 1 August 1944, Third Army had developed what twenty-first century US joint concepts would define as information forces. While they arrived in France untested, these nascent information forces not only succeeded; they became progressively more militarily effective as they accumulated combat experience and performance feedback. Throughout August, Third Army improved the integration of its capabilities and supporting functions. It also better aligned its concepts with available technology while remaining both physically and intellectually flexible and mobile. These changes directly enabled Third Army to generate information advantage over the Germans and sweep across France.

The explanation for this rapid change in Third Army between March and September 1944 lies in the process of adaptation. Positive adaptations are alterations to a military element's organization, equipment, processes, or other features that increase overall military effectiveness and thus the probability that the element will accomplish its goals.⁸ The process, at least theoretically, is relatively straightforward. Contact with the enemy produces performance feedback. Military organizations analyze this feedback, develop solutions to address performance shortfalls, and apply those solutions, thereby increasing military effectiveness. Yet, history shows that Third Army's rapid improvement is the exception rather than the rule. Positive adaptation is hardly a given; many—if, not most—organizations fail to adapt or do so slowly. Therefore, Third Army's experience is uncommon and suggests that another factor facilitated this rapid adaptation and military effectiveness improvement. **Information Advantage:** "a condition when a force holds the initiative in terms of relevant actor behavior, situational understanding, and decision making."

Information Advantage Activities: *"employment of capabilities to support decision-making, protect friendly information, and affect relevant actor perceptions, attitudes, and behaviors in order to gain and maintain information advantage."*

Information Forces: the planners and integrators of information advantage activities; elements possessing certain specific capabilities that primarily participate in information advantage activities as part of their core mission; and portions of the intelligence apparatus dedicated to supporting information advantage activities.

Figure 1.2. Information Advantage and Related Definitions.

Source: US Army Cyber Command (ARCYBER), "Operational Art for an Information Age Army" (speech, US Army Command and General Staff College, Fort Leavenworth, KS, October 2020), 6; and author's summary.

Thesis

Third Army's unique military culture directly facilitated the process of adaptation within its information forces, enabling Third Army to improve its military effectiveness and generate information advantage. Patton's visionary leadership created a sense of organizational urgency. This urgency produced a coalition dedicated to positive change within Third Army and reduced change resistance, facilitating positive adaptation. Patton and his coalition established robust feedback loops and a culture that welcomed self-criticism and experimentation. These formal and informal systems enabled Third Army to collect, analyze, and interpret performance feedback data accurately and efficiently. Finally, Patton encouraged the active participation of a diverse set of experts. He brought together individuals who challenged and complimented one another, forming a group greater than the sum of its parts. United in their commitment to Patton's information advantage vision, they consistently developed unorthodox but devastatingly effective solutions to complex problems. Improvements in Third Army's ability to generate information advantage resulted not from any technological advance or material factor. The progressive improvement of Third Army's ability to generate information advantage and its resultant sweep across France was the direct result of a military culture that emphasized continual improvement, welcomed feedback, and embraced diversity of thought.

Conceptions of Information Advantage in 1944 and 2021

US doctrinal concepts related to information have evolved significantly since 1944. Twenty-first century joint doctrine defines information as "the content and data that individuals, groups, and information systems communicate and exchange, as well as the human and technical processes used to exchange information."⁹ This study employs the twenty-first century term of information advantage not only for the sake of clarity but because it better reflects Patton's innovative approach to information. While this study explores the definition of information advantage in greater detail in chapter 2 and Appendix A, information advantage allows the commander to anticipate decisions, make them faster, and see them carried out with assurance. Information advantage is not a "natural" condition of being that results simply from having superior means; military organizations must actively generate it.

Twenty-first century US Army concepts specify that gaining and maintaining information advantage is accomplished through "the employment of capabilities to support decision-making, protect friendly information, and affect relevant actor perceptions, attitudes, and behaviors."¹⁰ Information advantage activities are not simply the employment of a capability to have an effect, but they are ongoing integrated processes aimed at generating marked operational advantage over the enemy.

The US Army in 1944 did not possess a similar overarching framework for gaining and maintaining advantage. Instead, it suggested techniques that commanders could integrate into operations to achieve tactical surprise. Doctrine at the time recognized that "the degree of surprise attained [in offensive operations] is dependent in a large measure on the coordination and timing of measures taken to deceive the enemy."¹¹ To this end, Army doctrine stipulated strict radio silence in preparation for deliberate attacks.¹² It also suggested that "feints, demonstrations, and simulated concentrations may be employed to mislead the enemy regarding the strength, time, or place of attack," and "dissemination of false information" could "deceive or mislead the enemy."¹³ US Army doctrine also stressed the importance of safeguarding "secret, confidential, and restricted documents," and ensuring "secrecy in the transmission of messages."¹⁴ These measures though were aimed primarily at achieving tactical surprise. There was little consideration of how to gain and maintain an advantage over the enemy throughout a campaign.

US Army doctrine in 1944 was also immature in its conception of how to employ specific other nascent capabilities. As the European Theater General Board concluded at the end of the conflict: "No substantial body of doctrine or plan of operations for psychological warfare existed before the outbreak of World War II; even now no fixed place for psychological warfare in the staff has been determined."¹⁵ Similarly, beyond recommendations to secure communications and speed information from the battlefield to the headquarters, there was little discussion of processes to enhance situational awareness and decision-making. Besides recommending that commanders provide the enemy with "false information," US Army doctrine was similarly mute on precisely how to design and integrate a deception plan into maneuver. All told, US Army doctrine throughout the conflict emphasized amassing firepower over enhancing friendly decision-making, and disrupting enemy decision-making.¹⁶

Patton's approach reflected a more intent-based framework for managing the employment of capabilities. He possessed a clear conception of how to achieve specific effects on friendly and enemy decision-making in an orchestrated fashion. Specifically, Third Army conducted three distinct activities:

- Enable Decision-Making: Enhance understanding of human and information dimensions; assure systems and processes for decision-making.
- Protect Friendly Information: Identify, secure, obscure, and defend friendly information and information systems from compromise or attack.
- Counter Adversary Information Use: Attack adversary elements of combat power and defend friendly use of information against adversary information attack capabilities.¹⁷

Chapters three through five of this study demonstrate that the concepts underpinning information advantage activities would not have been alien to Patton or Third Army by mid-1944, even though the terms did not exist in the doctrine of the time.

When seeking to describe or categorize military capabilities, twenty-first century US Army doctrine employs the term information related capabilities (IRCs): "tools, techniques, or activities employed within a dimension of the information environment that can be used to create effects and operationally desirable conditions."¹⁸ US Army doctrine in 1944 did not provide a framework for defining the relationship between capabilities and information. Field Manual (FM) 100-5 listed many "information-related capabilities" under the category of "counterintelligence" available to a commander, including "secrecy; discipline; concealment; tactical measures designed to deceive the enemy; restrictions on the preparation, transmission, and use of documents; signal communication security; precautions in the movements of troops and individuals; regulation of the activities of newspaper correspondents, photographers, radio news commentators, and visitors; censorship; counterespionage, and counterpropaganda."¹⁹

US Army doctrine did not define the relationship between other capabilities like physical attacks on communications systems and information one way or another. Thus, in keeping with 1940s doctrine, Patton did not distinguish between information-related capabilities and other military capabilities. Patton was revolutionary in his recognition that all military activities produce information and that all military capabilities impact the operational environment's information and human dimensions.²⁰ For instance, Patton understood that physical actions on the ground could affect the information dimension as much as actions in the electromagnetic spectrum. Thus, this study proposes that Patton had a well-developed understanding of the competition for time and information advantage and enable aggressive maneuver.

Consequently, in part due to lack of doctrine and partially due to its commander's cutting-edge conceptual framework, Third Army drew little distinction between the nature or category of capabilities themselves. Instead, it concentrated on desired effects in employing these capabilities, how to integrate them as part of activities, and how to generate advantage. Therefore, this study does not use the term information-related capabilities, as this term was not in use at the time and does not reflect Third Army's approach to information advantage. Instead, the study employs the broad term "capabilities" or specifies the exact capabilities employed.

The organizations that host these capabilities and are responsible for managing information advantage activities or portions of information advantage activities are information forces. For this study, the author defines information forces as comprising the planners and integrators of information advantage activities; elements possessing certain specific capabilities that primarily participate in information advantage activities as part of their core mission; and portions of the intelligence apparatus dedicated to supporting information advantage activities.²¹ Individual information forces host one or more capabilities. While Third Army did not employ the

term information force, it did create unique organizations such as the Army Information Service (AIS) specifically to enable decision-making. Based on its employment of other organizations such as its Signal Intelligence Service (SIS), Third Army considered these organizations as primarily responsible for protecting friendly information and denying the enemy the use of information. While Third Army never developed a single entity overall responsible for managing and deliberately integrating information across functions, it gradually adapted existing elements and staff sections to perform such a role. Thus, to discuss adaptation and operational-level information advantage, this study employs the term "information forces" to describe certain portions of Third Army.

In many ways, Third Army and Patton's approach to information, while based on 1940s US Army doctrine, was revolutionary. His views reflected his unique approach to warfare overall and set him apart from his peers. Patton saw information advantage as a means to open windows of opportunity against the enemy. He drew few distinctions between military

US Army and Joint Force 2021	Published US Army 1944	Patton 1944
Information advantage	No overarching concept	Unnamed concept; outpace enemy decision- making cycle
Information advantage activities	No overarching framework; measures to achieve tactical surprise: (i.e., deception, feints, demonstrations, and communications security)	Unnamed framework; enable friendly decision- making, protect friendly information, attack enemy decision-making
Information-related capabilities	No distinction between "information" and other capabilities; some grouping of capabilities under "counterintelligence"	No distinction between "information" and other capabilities
Information forces	No doctrinal definition	Unnamed construct; built organizations to serve an information purpose

Figure 1.3. Comparison of Doctrinal Concepts 1944 and 2021.

Source: Created by the author.

capabilities, organizing his thinking in terms of activities that could generate an advantage. Finally, he recognized specific capabilities required purpose-built forces to provide integrated effects. In the twenty-first century, these concepts would be called information advantage, information advantage activities, information-related capabilities, and information forces.²²

Research Approach and Outline

This study identifies how Third Army adapted to generate operational-level information advantage between March and September 1944. Specifically, it examines the role that three organizational factors—organizational urgency, robust feedback loops, and diverse expertise—played in developing positive adaptations and increased military effectiveness. To analyze adaptation and assess military effectiveness, the author employs a historical approach informed by a theoretical model of adaptation in combat. This model of adaptation in combat serves as a framework for examining the historical record of Third Army in 1944.

The second chapter of this study lays out the theoretical model for adaptation within information forces. First, it articulates a framework for information advantage. This framework and related definitions are explored in greater detail in Appendix A. It then establishes four parameters for measuring operational-level military effectiveness in information forces: integration of information resources, integration of support functions, consistency between operational concepts and available technology, and organizational mobility and flexibility. Additionally, this study provides a model for adaptation and explores the relationship between the three primary organizational factors and positive adaptation.

Having established a model for adaptation and the role of organizational factors, this study traces adaptation within Third Army between March and September 1944. The third chapter examines how Patton's experiences in North Africa and the Mediterranean led him to develop a unique and integrated approach to information advantage and how his influence shaped Third Army's culture. Chapter four demonstrates how the culture he built enabled Third Army to restructure itself in England to better align with his vision for information advantage. The fifth chapter illustrates how Third Army's culture facilitated dramatic adaptation in combat and increased combat effectiveness in France. Together these chapters trace Third Army's rapid adaptation between March and September 1944 and the impact of cultural factors on its performance.

The sixth chapter provides conclusions regarding how Third Army adapted to generate operational-level information advantage and infers

lessons for present-day information forces. Specifically, the study concludes that three organizational factors—urgency, robust feedback loops, and organizational expertise—facilitated the process of adaptation in a combat environment. This led to measurable increases in Third Army's operational-level military effectiveness. The study further concludes that Third Army's experience from March to September 1944 has particular significance for US Army information forces in the 2020s.

Significance of the Study

As the US Army considers how to combat a peer enemy across all domains, the Army must understand the drivers of military effectiveness in information forces. Given the technical sophistication of information forces and the close relationship between information forces and information technology advances, the natural inclination is to conclude that military effectiveness derives directly from material factors. Consequently, there is a particular emphasis on technological "invention" over non-material solutions and adaptation.

This work suggests that military culture has as much relevance to the generation of operational-level information advantage as material factors. Of course, retention of a technological edge is critical to gaining and maintaining an advantage. Yet, the 2018 National Defense Strategy observes: "Success no longer goes to the country that develops a new technology first, but rather to the one that better integrates it and adapts its way of fighting."²³ Military culture, or "the sum collection of beliefs, values, attitudes, and learned behavior of a group of people," significantly impacts how military organizations assimilate new technologies and integrate new capabilities into their current structure.²⁴ Military culture also affects how rapidly military organizations can adapt to the challenges and promises of new technology. Finally, military culture largely determines how efficiently military organizations use limited resources. A positive military culture is even more necessary in information forces than traditional forces, given the fast pace of information technology change.

Similarly, while the US Army recognizes the importance of experimentation in developing new concepts and capabilities, there remains a gap in understanding the decisive role that military cultural factors play in the success or failure of experiments in conflict or competition below the threshold of armed conflict. The 2018 Joint Concept for Operating in the Information Environment notes:

The Joint Force must experiment with organizational structure to maximize its ability to gain an Information Advantage. Additionally, the Joint Force must experiment with tactics, techniques, and procedures designed to sustain or change the perceptions, attitudes, and other elements that drive desired behaviors of relevant actors.²⁵

Lt. Gen. Stephen Fogarty, US Army Cyber Command (ARCYBER) commander, commented: "As the entire Army experiments to develop capabilities that enable [multi-domain operations], new, innovative formations will emerge."²⁶ If properly captured and analyzed, this feedback can encourage the emergence of valuable concepts that generate information advantage and, ultimately, future security for the US. This study suggests that cultural factors largely determine whether such experiments yield valuable insights and whether organizations leverage them to generate new concepts.

The example of Third Army in France suggests that military cultural factors are the primary driver of positive adaptation and increased military effectiveness. Patton's visionary leadership and ability to inject urgency for change into Third Army broke down resistance to new concepts. Third Army's well-developed feedback loops allowed it to gather insights from operational experiments, and a diverse set of experts leveraged these insights to create innovative solutions. By encouraging a culture that promotes adaptation, the US Army can posture itself to efficiently exploit new technologies and generate operational-level information advantage in the coming decades.

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Chapter 2 Literature Review: Toward a Theory of Adaptation and Information Advantage

You had the feeling that Third Army was going in only one direction—forward.

-Col. Brenton G. Wallace, Patton and His Third Army

This review will present a theoretical framework for how military cultural factors enable information forces to adapt, increase their military effectiveness, and generate information advantage. The study will:

- Establish a working definition of operational-level information advantage.
- Distinguish between the model of peacetime innovation and adaptation in combat.
- Propose parameters for evaluating the operational-level military effectiveness of information forces—to facilitate discussion of increases or decreases in military effectiveness.
- Describe "positive adaptation," its relationship with "negative adaptation," and the theoretical impediments to positive adaptation.
- Examine three critical factors of military culture, urgency, feedback loops, and diverse expertise and their relationship with positive adaptation.

In summary, this chapter will establish the applicability of the modified adaptation model to the question of change within information forces in combat and hypothesize that specific cultural attributes within organizations increase the probability that positive adaptation will occur.

Information Advantage

Operational-level information advantage is an inherently competitive activity that enables one side to gain and maintain the initiative while effectively balancing risk. Information advantage helps commanders efficiently link military actions in space and time across a campaign, and allows them to anticipate decisions at the operational level, continuously "forcing the enemy or adversary to react rather than initiate."¹ The cumulative effect of continuously anticipating events and possible decisions is that enemy understanding becomes progressively less up-to-date and enemy decisions less militarily effective. In particular, information advantage activities allow the commander to apply power against enemy capabilities or sources of strength such as command and control or intelligence simultaneously and in depth, disintegrating enemy combat power. Information advantage activities also extend the operational reach of a military organization, "the distance and duration across which a joint force can successfully employ military capabilities."² Commanders must balance the need to affect the enemy in depth and maintain the initiative with their formation's operational reach and the risk of overextension. Enemy capabilities, geography, or other environmental conditions constrain operational reach. Information advantage activities can mitigate the tyranny of distance, defeat adversary or enemy attempts to desynchronize friendly action, and extend the effects of friendly action in both time and space. In short, information advantage at the operational level is inextricably tied to initiative, anticipation, and reach.

Given that information advantage is a competitive activity, the critical question is how best to organize available capabilities and integrate them into information advantage activities. Furthermore, because the operational environment can and does change, the most efficient organizations and processes for leveraging capabilities through information advantage activities can and must change over time. Therefore, to optimize information advantage, it is necessary to understand how military organizations change over time

Innovation and Adaptation

Two primary models describe how military organizations change over time: innovation during peacetime and adaptation during conflict. These models are not mutually exclusive; they sometimes occur in parallel. Yet, different factors drive these fundamentally distinct processes. In peacetime innovation, organizations draw on lessons learned from previous conflicts and forecast future war dynamics. They design and deliver capabilities to meet those future challenges and test these capabilities using measures that replicate future conditions. During wartime adaptation, organizations deploy capabilities they have, receive feedback from the enemy regarding their effectiveness, analyze that feedback, design capabilities and concepts to counter the enemy, and deliver solutions to the field that increase effectiveness. Simultaneously the enemy follows the same process, resulting in complex adaptation.

Innovation in Peace

In times of peace, militaries focus on forecasting future conditions and develop capabilities that will be effective in those conditions. In the peacetime innovation model, militaries essentially rely on experience and a concept of future war to develop and field new formations, capabilities, and doctrine to meet future requirements. Barry Posen explains that during peace, militaries must "identify an enemy, if only for planning purposes," "identify the military capabilities of any particular enemy," and identify "technological opportunities both for the adversary and for oneself."³ They operate in what most theorists agree is an environment of change resistance.

Though military theorists differ on the exact mechanism that drives peacetime innovation, they agree that direct contact with the enemy is not a driving factor. Instead, assumptions about potential adversaries, not actual contact with the enemy, underpin peacetime innovation. The topdown process—led by a coalition of senior military leaders, civilians, or radical military reformers acting to coopt powerful actors—is rooted in the past but uses hypotheses about future combat.⁴

Adaptation in War

The other primary model of military change is "adaptation in war." In adaptation, an entity changes its organization, processes, and structure to become better suited to the challenges it faces.⁵ Adaptation is how an organization uses ongoing transformation initiatives in an actual situation.⁶ The model for "adaptation in war" describes how military organizations receive direct performance feedback from the enemy. Military organizations then process this feedback, use it to generate new capabilities, deliver those capabilities to the battlefield, then continue to conduct combat operations. Adaptation is essentially a bottom-up process, originating at the point of contact between one's forces and those of the enemy rather than a top-down process. It focuses on the near-term rather than future conflicts. Similarly, while the initial array of forces may have been based on lessons learned from previous wars, current conditions rather than conditions in previous conflicts primarily drive adaptation once war begins.

Williamson Murray lays out a general process by which military organizations adapt in war, beginning with performance feedback. Organizations then define and analyze the problem, develop potential solutions, implement those solutions, and adopt them. Often this process includes experiments to gauge the effectiveness of new concepts. For example, the German Army translated experimental storm troop unit performance from 1916 to 1917 into new doctrine by January 1918.⁷ The General Staff received feedback from the units, developed new concepts to employ the tactic at scale, guided additional experiments in battles during 1917, and repeated the process. With Field Marshal Ludendorff's support, this process culminated in January 1918 with the publishing of a new doctrine, "The Attack in Position Warfare."⁸

Murray's model is like the organizational learning process outlined by Richard Downie and applied by John Nagl to trace British Army doctrinal change in Malaya. Downie's model described how feedback or experience in the field can reveal organizational performance gaps. Given the right circumstances, organizations then search for alternatives to the status quo. After reaching consensus on a recommended change, the organization communicates the change across all levels; behavior in the field changes, more feedback is received, and the cycle repeats.⁹

Applicability of Models of Change to Information Advantage

Information advantage is competitive, involving direct contact with the enemy or other target populations, and is also relative to desired ends. Consequently, the same model that applies to other military organizations in conflict should apply to information advantage and information forces. There is also no reason to assume that peacetime innovation is more applicable than wartime adaptation, because information advantage activities do not always involve physical contact with the enemy. There are distinct differences between information forces and other military organizations and specific differences between combat performance feedback received by elements performing information advantage activities and those conducting combat operations in the physical dimension. As will be discussed further, the separation between information forces and the enemy results in attenuation of feedback. Despite this, the adaptation model is the most applicable descriptor of how change occurs in information forces over time.

Positive Adaptation, Stagnation, and Negative Adaptation

The adaptation model does not guarantee that adaptation will occur or that new concepts or attributes will increase military effectiveness. Historical examples clearly show that adaptation often does not happen, as armed forces continue to employ the same methods throughout a conflict. Similarly, military organizations regularly respond to the enemy's feedback and implement ineffective or, in some cases, counterproductive solutions. Thus, theoretically, certain impediments to adaptation interrupt the adaption model's process under perfect conditions. Given that enemy feedback to the information forces can be attenuated, a more precise definition of positive adaptation is necessary.



Figure 2.1. Model of Adaptation in Combat.

Source: Created by the author.

Military Effectiveness and Positive Adaptation

Positive adaptations are alterations to a military organization that increase its military effectiveness. Allen Millet, Williamson Murray, and Kenneth Watman define military effectiveness as the "process by which armed forces convert resources into fighting power, [the ability to destroy the enemy while limiting the damage that he can inflict in return]. A fully effective military derives maximum combat power from the resources physically and politically available."¹⁰ Thus, positive adaptations are learned behaviors, material changes, or organizing concepts that increase an organization's efficiency at completing its tasks. Applied to the information forces, military effectiveness is the organization's efficiency in converting its available resources into information advantage through information advantage activities.¹¹

Millet, Murray, and Watman describe several parameters that define military effectiveness at the operational level. One is the degree to which "the military organization's operational methods are integrated," and "to what degree organizations attempt to combine combat arms to take full advantage of their strengths while covering their weaknesses."¹² This concept can be applied directly to the contest for information advantage. Militarily effective organizations integrate available resources cohesively and logically into information advantage activities. They also have processes and structures that incorporate information advantage activities into operations across other domains to gain and maintain the initiative, anticipate decisions, and extend their operational reach while simultaneously denying the enemy the same. Militarily effective organizations, in other words, translate information into cognitive effects, producing information advantage. They then exploit that advantage to make gains in other dimensions and translate them into opportunities in the information dimension.

Similarly, Millet, Murray, and Watman identify activities that support an organization's effectiveness. They note that militarily effective organizations integrate supporting activities into their operational concepts and "have the capability to support their operational practices with the required intelligence, supply, communications, medical, and transportation systems."¹³ Integration of supporting activities is equally critical for generating information advantage. Without external support, organizations cannot leverage their capabilities effectively. Information forces at the operational level require dedicated intelligence support to analyze enemy emissions and captured communications systems. They also need a physical platform to access intended target audiences. Like all military organizations, information forces require logistical, transportation, and communications support. Unlike other traditional military organizations, information forces need specialized support such as special cryptographic materials and bulk communications services.

Millet, Murray, and Watman further argue that effective military organizations have operational concepts consistent with available technology. They highlight how military organizations typically do not fully exploit available technology.¹⁴ They ascribe some of this failure to sociological reasons and view it as a strong indicator of military ineffective-ness at the operational level. Their definition also references utilizing operational concepts that outstrip the capabilities of available technology. Thus, creating operational concepts that are based on a misunderstanding

of current technological capabilities can result in military ineffectiveness at the operational level. Given the close relationship between technology and particularly communications technology and information forces, such organizations are more likely to overestimate technological potential than fail to adopt new technologies. Thus, militarily effective information forces must possess operational concepts that fully exploit but do not exceed the available technology's actual capabilities.

Millet, Murray, and Watman finally highlight the importance of organizational flexibility in operational level effectiveness—specifically an organization's ability to move "both intellectually and physically in either anticipated or unanticipated directions."¹⁵ Flexible organizations can rapidly reorient themselves on targets of opportunity, seize the initiative, and exploit in the physical domain. This parameter also implies a high level of self-awareness and confidence to make well-informed decisions rapidly. At the operational level, militarily effective information forces delegate the relevant authorities to seize the initiative and rapidly exploit opportunities. Additionally, coordination mechanisms should not adversely impact the information force's ability to reorient rapidly on new targets. Finally, information forces must have the resources to acquire new capabilities quickly and the authority to reorganize and shift their efforts without an extended approval process.

Parameter 1	Integration of resources as part of information advantage activities
Parameter 2	Integration of support functions to support information advantage activities
Parameter 3	Consistency between operational concepts and available technology
Parameter 4	Organizational mobility and flexibility (physical/intellectual)

Figure 2.2. Parameters of Militarily Effective Information Forces.

Source: Allan R. Millet, Williamson Murray, and Kenneth H. Watman, "The Effectiveness of Military Organizations," in *Military Effectiveness*, eds. Allan R. Millet and Williamson Murray (Cambridge, MA: Cambridge University Press, 2010), 13.

Thus, Millet, Murray, and Watman's definitions of military effectiveness suggest several overarching parameters for militarily effective information forces at the operational level. By extension, positive adaptations increase military effectiveness by bringing an organization more in line with these parameters. First, highly militarily effective operational-level information forces optimally integrate all information resources as part of information advantage activities. Second, they integrate support functions to enable the organization's core capabilities both at the operational and tactical levels. Third, these organizations exploit available technology and develop appropriate operational employment concepts that match the technology's demonstrated capabilities. Finally, they are mobile and flexible enough to reorient themselves on new threats or opportunities. Therefore, operational-level information forces are militarily effective to the degree to which they exist within these four parameters. Information forces that are in line with these parameters are more likely to accomplish their assigned tasks.

Changes in military effectiveness do not occur in a vacuum. An enemy can adapt and improve their military effectiveness while friendly organizations do the same, creating a cycle of complex adaptation. Murray defines complex adaptation as the process of change in an environment where "both sides adapt on a continuous basis to the very changing conditions of the battlefield."¹⁶ He cites the second half of World War I as an example of complex adaptation; both sides simultaneously grappled with how to overcome the "riddle of the trenches."¹⁷

While military effectiveness can confer an advantage, it does not guarantee dominance. Overwhelming quantitative advantages can offset qualitative organizational advantages. Changes in the operational environment or technology may make some elements less efficient than they were in the past.



Figure 2.3. Equation for Calculating Total Fighting Power.

Source: Allan R. Millet, Williamson Murray, and Kenneth H. Watman, "The Effectiveness of Military Organizations," in *Military Effectiveness*, eds. Allan R. Millet and Williamson Murray (Cambridge, MA: Cambridge University Press, 2010), 13.

Consequently, relative total fighting power can change over time, resulting in a theoretical demand for organizational improvement. Like complex adaptation, this makes adaptation dynamic and drives a cycle in which organizations continuously need to change.

Stagnation

Despite their continuous need for change to ensure maximum fighting power in the context of complex adaptation, military organizations are remarkably change-resistant. Two broad factors contribute to operational-level stagnation. First, military organizations struggle to assimilate performance data from the tactical level. The second is a natural "change resistance" within military organizations.

Murray notes that operational-level leaders are detached to a certain extent from the conditions on the battlefield and their units' actual performance. Thus, they continue to apply outdated or irrelevant paradigms, unaware that conditions have changed.¹⁸ Even when performance data collection mechanisms are in place, these mechanisms can be either poorly designed or underutilized. This detachment can have the same dampening effect, resulting in stagnation.

Within information forces, some barriers to assessment are "the failure to establish objectives that are measurable, the failure to collect baseline data against which one can compare 'post-test' data, and the failure to plan adequately for the collection of assessment data, including the use of intelligence assets."¹⁹ Combat provides extensive feedback, but not all of it is equally relevant or even quantifiable. Consequently, information forces must develop precise information requirements and standards for analysis. Without a coherent data capture framework, organizations cannot ingest bottom-up feedback. Similarly, Joint Publication 3-13, *Information Operations*, notes:

It may be difficult or impossible to directly relate the behavior change to an individual act or group of actions. Also, the logistics of data capture are not simple. Contingencies and operations in uncertain or hostile environments present unique challenges in terms of operational tempo or access.²⁰

Feedback from the field becomes attenuated by the difficulty in establishing causality. Given that one purpose of information advantage activities is to influence actor perceptions, the efficacy of information advantage activities is, to a certain degree, unknowable. Only targeted actors definitively know their perception of the environment. Consequently, when attempting to measure information advantage activity effectiveness,

Collection/Analysis Factors Contributing to Stagnation/Negative Adaptation
Failure to plan for data collection
Failure to collect baseline data
Failure to establish measurable standards
Difficulty in establishing causality
Operational tempo/access
Rapidly changing conditions

Figure 2.4. Data Collection and Analysis Factors Contributing to Stagnation or Negative Adaptation.

Source: Joint Chiefs of Staff, Joint Publication 3-13, *Information Operations* (Washington, DC: 2014), VI-10.

assessments are based on the actor's behaviors. Even if the actor's perceptions are successfully altered, the alteration does not necessarily cause changes in the actor's behavior. The difficulty in establishing causality is also apparent in measuring the effects of enhanced situational understanding. Increased situational understanding, while critical in enabling timely and rational decisions, does not guarantee a behavior change. Also, the distance between senior leaders and often highly technical information advantage activities further complicates an organization's ability to establish causality.

Organizations may still be prone to stagnation due to organizational change resistance, regardless of whether they have established performance data collection mechanisms. While there are multiple explanations for why military organizations are change-resistant, two significant causes are individual influence and collective influence within organizations. Adam Jungdahl and Julia MacDonald advance an argument that "gatekeepers" within an organization "decide who has access to positions of power within the military bureaucracy within a particular issue area, and they can regulate the flow of information and political influence to senior leaders."²¹ In other words, key individuals within an organization can restrict the flow of information, thus disrupting the process of integrating lessons from the field and developing solutions to address performance
gaps. The decision to limit information or disregard it could be due to cognitive bias or personal belief.

Another explanation for change resistance deals with the role of collective inertia. R. W. Kromer posits that organizations naturally prefer to continue doing what they are used to "rather than change accepted patterns of organization or operation."²² Even when there is a pressing need for change, organizational inertia argues against adopting radical change. Murray goes one step further, noting that rather than simply being change-resistant, bureaucratic institutions aim at "imposing order and form on a world that is inherently disorderly and ambiguous. They exist to act as a brake on significant changes that upset current patterns of behavior."²³ Bureaucratic institutions and functions are not designed to hinder progress specifically. Instead, they reduce deviation from accepted parameters to ensure greater efficiency. Consequently, collective inertia and, in some ways, collective change hostility is inherent within all bureaucratic functions and organizations.

Instituting organizational change can be difficult and almost certainly entails some risk, particularly in combat. Even if an organization observes that it is not maximizing its military effectiveness, the risk inherent in changing proven methods in combat argues against making changes. Organizations are also naturally more inclined to improve performance within the current construct than change that construct. Kromer further asserts: "The more hierarchical and disciplined they are—military organizations are almost archetypes—the greater the built-in institutional obstacles to change except slowly and incrementally."²⁴ Even more than businesses or other governmental organizations, military organizations have a chain of command and natural deference for authority. Authority is vested in those who have succeeded within the current construct. Therefore, military organizations tend toward inertia, resulting in stagnation, even if they face a changing environment.

Stagnation, therefore, is not only possible but highly likely in military organizations. The difficulties associated with assimilating combat performance, the role of gatekeepers, perceptions of the risk associated with change, and the natural inertia of large organizations mitigate against the adaptation model's perfect functioning. Without forces to counteract these barriers to adaptation, change is less likely to occur.

Negative Adaptation

Similar to the phenomenon of stagnation is that of negative adaptation. Organizations may recognize the need to change but make changes in counterproductive ways for a variety of reasons. These counterproductive changes could be prompted by dominant subgroup interests, using imperfect information to generate new concepts, relying on a flawed analysis of good quality information, poorly designing solutions to the problem, or poorly implementing high-quality solutions.

Organizational politics theory argues that military organizations are not unitary but consist of coalitions of groups, some of which are more dominant than others. Theo Farrell proposes that "dominant group interests become embedded in organizations, and from that dominant position such groups are well placed to extend their networks into the policy environment to build coalitions in support of their interests."²⁵ Where the interests of the military organization as a whole and the interests of its dominant groups diverge, the military organization is inclined to pursue the dominant group's interests. This divergence can and does lead to negative adaptation. While this is most likely at the institutional level, it also holds direct relevance at the operational level.

Organizations may be open to change and relatively unbiased in their methods but adapt in counterproductive ways. Poor-quality information obtained from the field or poor-quality analysis of that information can lead organizations to misidentify problems. In addition to stagnation, the same barriers to assessment can result in negative adaptation. Poorly designed metrics for measuring performance and effectiveness can cause organizations to make changes that address problems that do not exist or are ancillary to the organization's core function. Even if the problem is understood correctly, negative adaptation can result from adoption of poorly designed solutions or poor implementation of well-designed solutions.

Adaptation, therefore, is not a foregone conclusion in conflict as bureaucratic inertia, organizational politics, and other impediments can stymie change or even foster maladaptive change. Positive adaptation is not guaranteed as suggested under the perfect conditions model and is probably less likely in information forces under any circumstances. Consequently, cultural factors must counteract these impediments for positive adaptation to occur.

Three Factors that Encourage Adaptation in Information Forces

Organizational urgency, robust feedback loops, and diverse expertise enable information forces to overcome resistance and adopt positive adaptations. These factors allow organizations to decisively orient on performance gaps, rapidly develop solutions, and objectively test them. While applicable across all organizations, these three factors are particularly relevant for information forces. Because of the attenuation in feedback received from the enemy, complexity in measuring performance, and often-high technical barriers to entry within information forces, these three factors are even more important to fostering adaptation. An examination of the historical record shows that Patton understood the importance of building a military culture centered on these three factors.

Urgency

Urgency is the perceived need for change within an organization. The creation of urgency within an organization usually begins with a vision for change that articulates the consequences of inaction and the potential benefits of change. This vision also describes the unique attributes that allow the organization to exploit a window of opportunity.²⁶ Organizations that experience a crisis, organizational failure, or physical danger experience a greater general sense of urgency and dissatisfaction with the status quo. Yet, only when leaders link these experiences with a shared vision for change does this urgency significantly contribute to adaptation.

To a certain extent in maneuver units at the tactical level, there exists a particular natural urgency that results from close combat with the enemy. However, this psychological urgency does not necessarily exist within organizations at the operational or strategic level or information forces removed from close combat. Consequently, it is incumbent on leaders to create a sense of urgency to encourage adaptation.

According to John Kotter's model for encouraging organizational transformation, senior leadership is essential in creating organizational urgency. Kotter argues: "Change, by definition, requires creating a new system which in turn always demands leadership."²⁷ Yet, organizational urgency is not entirely synonymous with good leadership. Kromer notes in his case study: "Vietnam shows how even highly qualified and experienced leaders, many of whom saw the need for adaptive change, were often frustrated in their attempts to get it."²⁸ Technical competence, tactical knowledge, and even strong leadership do not necessarily generate the urgency to overcome barriers to positive adaptation. A senior leader's successful battlefield performance can be uncorrelated with the creation of urgency.

Leadership that is intellectually curious, engaged, and aggressively change-minded is necessary to overcome bureaucratic inertia and convince powerful subgroups to accept change for the sake of increased or-ganizational health. Kotter observes that "frank discussion of potentially unpleasant facts" usually precedes successful organizational change.²⁹ A willingness to be unbound to a certain extent by precedent combined with the intellectual honesty to be self-critical is essential, allowing the leader to face reality honestly and aggressively attack organizational shortfalls.

Similarly, a leader must have the courage, humility, and tact to identify and candidly discuss shortfalls with relevant parties.

Finally, urgency is a product of a leader's ability to articulate a vision and build a coalition dedicated to that vision. Kotter comments that leaders must focus their organization on a "window of opportunity that is open today but may close tomorrow" and provide a vision that appeals to organization member heads and hearts, encouraging them to "volunteer" for change.³⁰ Thus, the leader's vision is a crucial driver in forming a coalition working for change. Given that a leader cannot gather and analyze information from the bottom up or generate solutions and implement fixes without assistance, this coalition is essential to successful adaptation.

Patton discovered similar lessons regarding the importance of creating urgency through his lifelong study of military affairs. In 1915, Patton read the book *The Crowd: A Study of the Popular Mind* by Gustave Le Bon and noted in the margins: "The individual [leader] may dream greatly or otherwise, but he must infect the crowd with the idea to carry it out."³¹ Patton understood that to create change, a leader must offer a vision that infects followers with an idea. It is not enough to simply possess a vision for the future or even develop an approach for accomplishing it. He recognized that a leader must engage the organization emotionally and intellectually, enlisting members of the organization in the project of change. Patton would draw on this lesson in designing his approach to encouraging change within Third Army in 1944.

Robust Feedback Loops

Well-established and clearly defined methods for performance data collection, analysis, and dissemination are necessary for organizations to learn from experiences. David Garvin suggests four key factors that are critical to institutionalizing robust feedback mechanisms within an organization. First, the organization must encourage a systematic approach to problem-solving, pushing "beyond obvious symptoms to assess underlying causes, often collecting evidence when conventional wisdom says it is unnecessary."³² Second, the organization must be open to experimentation and "systematic searching for and testing of knowledge."³³ Third, the organization must learn from past experiences, systematically analyze them, and develop lessons from sometimes-complex information.³⁴ Finally, the organization must disseminate these lessons as broadly as possible across the organization in a manner that allows for rapid assimilation and follow-on action.³⁵

Kromer's work essentially confirms the importance of evaluation. He places "a higher premium on thorough evaluation and analysis of performance since even the best managers need analytical tools to design optimum responses and facilitate learning."³⁶ Even superior leaders who have created a sense of urgency require data on which to base their adjustments. The lack of established feedback loops effectively severs the connection between the experiences on the front line, the expertise necessary to generate fixes, and the organizational leadership needed to implement them.

Underlying all of this is a requirement for consciously developed and articulated performance and effectiveness measures. Anthony Dibella, Janet Gould, and Edwin Nevis wrote: "Effective experimentation requires a set of well-developed methods for measuring gaps between expected and actual performance, and for designing effective action based on those results."³⁷ Simply receiving data or even actively seeking out opportunities to increase the amount of performance data captured is insufficient. Organizations must have a clear understanding of what types of data are necessary to draw conclusions about operational performance. These data requirements may differ from organization to organization and may shift within an organization over time. Consequently, continual analysis of performance data requirements is necessary to create and maintain robust feedback loops.

In total, feedback loops are culturally based processes and structures for gathering combat performance data from the field, filtering that information up the chain, analyzing the data, drawing conclusions, and conducting experimental field tests.³⁸ Feedback loops represent mechanisms intentionally emplaced within an organization to ensure that leaders are not isolated from the organization's actual performance. Operational-level leaders are naturally separated from their organization's outputs. Similarly, the danger, confusion, and pace of combat combined with a lack of feedback loops can leave a leader unaware of actual combat performance and reliant only on anecdotal feedback. Finally, the attenuation of feedback in information forces, and the difficulties in establishing causality between information advantage activities and battlefield outcomes, make the presence of robust feedback loops even more essential for adaptation to occur.

Patton was no stranger to performance feedback loops and experimentation in combat. During the Putative Expedition in Mexico, for example, General John J. Pershing confronted a young Lieutenant Patton for ordering a messenger flight during dangerous weather conditions. General Pershing chided Patton: "You have made a mistake. I would not have ordered such a dangerous flight, but I know you did what you thought was right, and I assume the full responsibility."³⁹ Pershing's response had a lasting impact on Patton, underscoring the importance of underwriting the decisions of subordinates. It also shaped his understanding of how organizational and personal growth involves experimentation, risk-taking, and often failure.

Similarly, Patton understood the importance of data collection and had firsthand experience with organizational experiments and testing. As the first officer assigned to the Tank Corps, an instructor, and commander in World War I, Patton led the development of American thought on the organization, operation, and employment of tank units in combat.⁴⁰ During the inter-war years, Patton remained involved in experimentation and analysis of new trends in mechanization, particularly as head of the Plans and Training Division within the Office of the Chief of Cavalry from May 1928 to September 1931.⁴¹ The example of his hero General Pershing, combined with his various inter-war positions and combat experiences, informed Patton's 1944 approach to creating a performance feedback-oriented culture.

Diverse Expertise

The presence of diverse expertise can prevent groupthink and facilitate development of innovative solutions. An organization with diverse membership can draw on different knowledge bases, experiences, and ways of problem-solving. Correlation between a greater diversity of skillsets or experiences and positive outcomes makes intuitive sense, even with potential organizational conflict resulting from differences between group members.

Some research studies indicate diversity is not simply correlated with positive outcomes but causes positive effects through productive organizational tension. Groups are prone to be "fluency heuristic: we prefer information that is processed more easily, or fluently, judging it to be truer or more beautiful."⁴² Thus, hearing from diverse points of view is often not only uncomfortable but requires additional engagement to comprehend the views. Psychological research shows that this difficulty in assimilating unfamiliar information or viewpoints sparks creative thinking and innovation. In their 1961 work, L. R. Hoffman and N. R. F. Maier indicated that diversity in personality and outlook strongly correlated with superior task solutions even when tasks were designed to elicit conflict among team members.⁴³ Michael Aamodt and Wilson Kimbrough documented a similar phenomenon in undergraduates in the 1980s.⁴⁴ The work of these and other researchers strongly suggests that "diverse teams are more likely to constantly reexamine facts and remain objective" and "diversity enhances the breadth of perspective, cognitive resources, and overall problem-solving capacity of the group."⁴⁵

Kromer reinforces this point and suggests that the lack of diverse expertise contributed to the US military's inability to change its methods during the Vietnam War. He notes that most middle-level senior officers and officials were picked for their roles "on the basis of normal institutional criteria or even the convenience of the institution rather than because they were regarded as particularly qualified for the job."⁴⁶ In other words, organizational bias toward specific attributes tended to insulate the organization from diverse viewpoints. The lack of diverse perspectives contributed to general inertia and a lower problem-solving capacity within the group.

Diverse experience and inter-disciplinary expertise thus are critical factors in overcoming change resistance and enabling adaptation. Organizations that have diverse experts in positions of power at every level are less likely to suffer from the gatekeeper phenomenon. Cultivating diverse views mitigates institutional bias because diverse viewpoints challenge status-quo thinking and actively encourage members to engage creatively with the problem at hand. Diverse professional backgrounds within group leadership could, under some circumstances, also reduce some of the effects of organizational politics. As previously mentioned, intellectual honesty is essential when measuring organizational performance and effectiveness. Diversity encourages intellectual honesty and open inquiry necessary to reach conclusions and is vital in developing new methods to address the performance gap. Given the difficulties associated with measuring performance and developing effective solutions, diverse expertise is essential within information forces.

Patton's self-development during the interwar years almost certainly influenced his approach to diversity of thought. Immediately following the conclusion of World War I, Patton devoted himself to reflecting on and articulating his experiences from the conflict. As a student of history, Patton was intensely interested in the human and interpersonal elements of warfare.⁴⁷ In his unpublished 1919 book, *War as She Is*, Patton noted that staff sections tend to become engrossed in their particular function and "fail to consider their bearing on the whole;" he added that only through cross-section engagement would "all of the tribulations . . . become known, and through the chief, to the commanding general."⁴⁸ Patton described how an interdisciplinary approach could mitigate the potential danger of groupthink. He recognized that dialogue could shed light on organization-al shortfalls and creative friction could produce innovative solutions. Over

the next two decades, Patton synthesized his distinctive approach to organizational change, drawing on his lifelong study of leadership and human psychology and incorporating his deep understanding of the importance of diverse expertise.

Summary

This chapter defined operational-level information advantage, articulated the model by which information forces change over time, explored barriers to positive adaptation, and outlined three cultural factors that enable positive adaptation. The adaptation model in combat is more applicable to how information forces change over time than the innovation in peacetime model. Yet, historical and theoretical literature demonstrate that certain factors impede the emergence of traits that increase military effectiveness and may foster maladaptive characteristics. Three factors are critical for promoting positive military adaptation: urgency, robust feedback loops, and diverse expertise. Third Army's experience from March to September 1944 demonstrates how these military cultural factors encouraged adaptation. These adaptations made Third Army more militarily effective, allowing it to generate operational-level information advantage against a peer enemy in a high-tempo campaign.

Notes

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Chapter 3 Forming the Lucky Culture: Spring 1944

Things are shaping up well, but I wish we had more of the killer instinct in our men.

-Lt. Gen. George S. Patton Jr., The Patton Papers

On 27 January 1944, General George S. Patton traveled to Greenock, Scotland, to meet the Third Army's first elements arriving in Europe. He greeted them: "I am your new commander. I'm glad to see you. I hope it's mutual. There's a lot of work to be done, and there's little time to do it."1 While it was unclear in early 1944 precisely what role Third Army would play in the invasion of fortress Europe, Patton already planned to make the battle for France and Third Army his own. He would imbue in his soldiers a desire for efficiency and a taste for victory and encourage aggressive action informed by professional expertise. He would create an army that was as flexible in its methods as it was mobile on the battlefield. Third Army would be competitive, take risks, and maximize every advantage while presenting the enemy with no opportunity to recover. The process of adapting Third Army from a new organization into the mighty armored fist that it became took months. But the urgency for change imparted by Patton, the robust methods of performance feedback, and the diverse expertise across Third Army laid the groundwork.

Patton Visualizes the Battle for France

In March 1944, Third Army established its headquarters in Knutsford and the nearby town of Peover in the English Midlands, south of Manchester.² Through his intensive study of military art and experiences in the Mediterranean, Patton had "developed an instinctive understanding of the operational art," particularly the process of visualization.³ By the time Patton arrived at Knutsford, he had a clear vision for how to prosecute the Battle for France. Patton directed his intelligence officer (G-2), Col. Oscar Koch, to begin intelligence preparation for an offensive toward Metz. At the time, allied plans tasked Third Army with seizing the Brittany peninsula to the west, and staff projected Allied forces would not reach the Metz area until 330 days after landing in France.⁴ Much of Third Army's staff had not yet arrived in England, and the D-Day landings in Normandy were months away, but already Patton visualized a bold thrust across France and Germany.⁵ As a commander, Patton expected his subordinate commanders to exercise independent judgment and tactical daring to sustain the offensive's momentum. He also had confidence in armor's ability to disrupt enemy rear areas and sustain itself deep in enemy territory.⁶ As a cavalryman, he put his faith in the old cavalry motto "in mobility lies our strength."⁷ In short, Patton did not visualize the battle for France as a systematic reduction of German positions. Instead, he saw it as a sweeping high-tempo offensive focused on objectives deep in the enemy rear area that balanced risk to gain and maintain the initiative and take advantage of windows of opportunity.

Patton Visualizes Obstacles to Operationalizing His Approach

A series of problems stood between Patton and his vision of a sweep to the German border. First, given the preparation of the German defenses, how could Third Army gain the initial space necessary to maneuver and breakout? Second, a breakout would stretch Third Army across scores, perhaps hundreds of miles. How could Third Army sustain its momentum and reorient on new opportunities or threats if elements lacked direct contact with one another? Patton's experiences in Africa and Sicily indicated the vital importance of always knowing the location of all one's forces, but reports from the front were often late or inaccurate.⁸ Third Army operations section (G-3) estimated that the standard time required to process and route routine information from a front-line unit to the Army command post was roughly ten to twelve hours.9 Part of the difficulty was limitations of tactical communications systems. Still, intermediate commanders' failure to speed information up the chain contributed to the problem as well.¹⁰ Finally, given the enemy's ability to trade space for time, how could Third Army prevent the German Army from reorganizing, disrupting Third Army's offensive, and regaining the initiative? His solution was a coherent vision of information advantage and how it could enable operational maneuver.

Patton Visualizes Information Advantage

As early as 1943, Patton developed a concept for leveraging information advantage to first gain and then maintain the initiative:

First—surprise; find out what the enemy intends to do and do it first. Second—rock the enemy back on his heels—Keep him rocking—never give him a chance to get his balance or build up. Third—relentless pursuit—a l'outrance as the French say—beyond the limit. Fourth—mop him up.¹¹

Reflecting his appreciation for the value of quality intelligence, Patton viewed intelligence as providing an initial advantage to do it first. He understood that intelligence not only gives an indication or warning of enemy activity but helped with gaining the initiative and pursuing operational-level maneuver. Throughout his command, Patton treated intelligence as big business, receiving multiple intelligence briefings per day and populating his inner circle of advisors with a preponderance of intelligence officers.¹² This level of engagement with intelligence and intelligence staff was distinctive among senior commanders in the European Theater.¹³

Similarly, Patton's enjoinder to rock the enemy back on his heels suggests an understanding that he could attack an enemy's cognitive processes. By denying information to the enemy, providing false information, or reducing the time available for the enemy to make decisions, Patton could get "inside the enemy's decision cycle."¹⁴ Colonel Koch described Patton's formula as "applying the tactical concept that it would take a certain minimum of time for a large enemy force to react. By progressively following up his first action by a second in less than that minimum, he would catch his enemy in the act of maneuvering to react to the first and so on ad infinitum. This would continue as long as the situation was in his control."¹⁵ Understanding the critical relationship between speed and the initiative, Patton recognized that if he could inject friction, misinformation, delays, or indecision into the enemy decision-making process, he would continually keep the enemy reactive.

This approach did not run counter to early 1940s US Army doctrine, as much as it considerably elevated the importance of speed. Field Manual (FM) 100-5, *Operations*, acknowledged that "superior mobility and speed of execution may be determining factors in achieving surprise."¹⁶ Yet, it went on to propose that "the best guarantee of success in the attack is effective cooperation between the troops in the attack echelon, the supporting artillery, and any supporting combat aviation."¹⁷ Patton certainly concurred with the criticality of coordinating and massing fires. Departing from traditional Army doctrine, Patton greatly emphasized speed of decision-making and execution.

Patton's emphasis on not allowing the enemy to build up or get his balance also reflects an understanding that the enemy seeks situational understanding and the information necessary to mass combat power at decisive points in space and time. By protecting its information and ensuring an advantage in situational awareness, an army can prevent the enemy from developing situational understanding and regaining the initiative. Patton understood this need for information security in granular detail and conceptualized it in terms of a time-based competition for information advantage in which the winner gained or maintained the initiative. For example, after the war, he reflected: "The decision as to whether to use clear or code, radio or wire communications is very easily reached on the

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following basis: if the period of action is shorter than the period of reaction, use clear; otherwise, use code."¹⁸ Put differently, Patton recognized that information security procedures could keep him within the enemy's decision-making cycle when high tempo on its own could not.

Similarly, Patton saw common situational understanding as a means to keep the enemy from regaining its balance. Common situational understanding rests on the rapid and assured transmission of information. In the summer of 1944, Patton provided a letter of instruction to all division and corps commanders emphasizing:

Information is like eggs, the fresher, the better. Keep troops informed. Use every means before and after combat to tell troops what they are going to do and what they have done.¹⁹

Both Patton's assessment of communication security and his emphasis on rapid transmission of information show his intimate understanding of the relationship between information and time. Information was only valuable if one possessed time to orient, decide, and act on the information gained.

While Patton certainly viewed pursuit as a type of offensive operations, he apparently saw information activities as a means to demoralize, confuse, and further disintegrate enemy formations, allowing his forces to mop them up. If anything, Patton had a deeper appreciation for the human side of war than most of his peers. He understood that armed forces typically resist only if they believe they can defeat the enemy. He worked to inspire confidence in his soldiers and appreciated the value of degrading the enemy's confidence.²⁰ Therefore, Patton sought to present the enemy with multiple dilemmas and confound enemy expectations in the physical dimension, in coordination with actions taken to affect the enemy cognitively. These actions would produce a shock effect, allowing him to mop them up.

Patton possessed a clear, cohesive, and comprehensive vision of information advantage and how it could enable him to fight a war of maneuver in France. He viewed intelligence, particularly strategic intelligence, as a tool that could provide an initial information advantage if operationalized aggressively. This intelligence, combined with superior situational understanding and assured decision-making processes, allowed him to make the first move and dictate the rest of the campaign's tempo to the enemy. Patton saw the value in attacking enemy sources of information and decision-making processes to disrupt and delay enemy decision-making. He also understood how protecting friendly information allowed him to keep control, even as the enemy attempted to catch up by fighting for information. For Patton, information was competitive, and the prize was time—time to exploit tactical successes and achieve operational results.

Patton's vision of information advantage was rooted in his deep understanding of military history and his North Africa and Sicily experiences. Colonel Koch described him as the consummate "military analyst," possessing a retentive memory to store anything and everything with a military application.²¹ In the interwar years, Patton devoted his time and effort to the "arduous, systematic program of preparation to lead soldiers in battle."²² Patton's methodology was also rooted in a comprehensive understanding of US Army doctrine of the period. Yet, he differed from his peers in his ability to think operationally and recognize speed's importance in maintaining the initiative across a campaign. Consequently, in 1944, Patton and his core staff possessed a clear vision of generating information advantage at the operational level and how information advantage could enable maneuver.

Patton Assembles His Team of Diverse Experts

To operationalize his information advantage concept, Patton turned to his expert staff. Following his departure from Sicily, Patton brought several of his core staff officers from the Seventh US Army and replaced most of the original Third Army senior staff. The staff was a diverse set of individuals, but universally they were experienced and remarkably intelligent-and to some degree, like their commanding general, somewhat on the outs with Army leadership. These included Chief of Staff Brig. Gen. Hobart Gay, a cavalryman who later transferred to Quartermaster Corps. He was replaced as chief of staff by Maj. Gen. Hugh Gaffey, an artillery officer who later transferred to Armor. One of Patton's principal aides, Col. Al Stiller, had served as a sergeant in the Tank Corps during World War I.²³ Colonel Koch, G-2, a cavalryman who transferred to Intelligence, "was regarded by many as having the 'most penetrating mind in the US Army's intelligence community."²⁴ Like Koch, the G-3 (Col. Halley Maddox) was a cavalryman. Third Army's signal officer, Col. Elton Hammond, was a career signal officer who was viewed as highly effective.²⁵ Col. Brenton Wallace, a G-3 officer, described them as "a group of individualists. No two were alike."26 This exceptional group of officers served as Patton's privy council and shared a remarkable degree of trust, candor, and creative license.²⁷ While united in their loyalty to Patton and their shared North Africa and Sicily experiences, the group was remarkably diverse.

Patton replaced most of the Third Army senior staff with his veterans from Seventh Army, but most of Third Army's staff remained unchanged. Up to this point, Third Army had served as a training headquarters validating army-level doctrine. Third Army had managed more than 750,000 soldiers spread across the southern US and, therefore, had some familiarity with challenges to Patton's vision for the battle for France. Experienced as trainers and evaluators, they were also proficient in the latest US Army doctrine and best practices. While most section chiefs were regular Army officers, most Third Army staff were "civilian"—officers who joined the Army during its rapid expansion over the previous three years.²⁸ Almost all the executive officers and sub-section officers fell into this category and came from a great variety of professional and educational backgrounds.

Still others had risen through the enlisted ranks, earning commissions as the Army rapidly expanded for war. One of these sub-section officers was Maj. Charles W. Flint, a "young, trigger-smart expert" who served as the Signal Intelligence Service chief.²⁹ Major Flint initially enlisted in the US Army Signal Corps in 1931, eventually commissioning as a Signal officer in 1938.³⁰ While he had limited combat experience, Major Flint had a first-rate intellect and a unique perspective gained from more than a decade of hands-on Signal Corps experience. Despite their short Army careers or humble origins, Patton highly respected these "pick and shovel workers" like Major Flint.³¹

Thus, in early March 1944, Patton, in effect, had two staffs. One consisted exclusively of regular army officers with extensive combat experience in the Mediterranean and North Africa. The other was majority "civilian" with experience training and administering large complex formations across vast areas. In addressing this newly combined staff, Patton said:

We now have two staffs merging into one, each with its own procedures. By working harmoniously and intelligently together, a third staff will be developed with a third procedure, which should be better than either of the two.³²

Patton recognized and embraced the diversity of his staff. He promoted adaptation by forcing the two staffs and all their diverse members to interact and develop new solutions to operational problems. Patton also demonstrated through his words and actions that he expected the new Third Army team to integrate diverse points of view.

Patton's influence and the urgency for change that he imparted to his staff were critical in making this positive adaptation possible. The Third Army staff, and most of the soldiers in Third Army at large, felt they were a valued "part of his team—that he was not a remote presence, issuing cold and emotionless life-and-death dictates but one of them; that he shared and understood their life and dangers."³³ Colonel Wallace noted that Third Army prized results over all else: "If you knew your job, you were allowed to perform it in your own way and were never told how to do a thing. . . . The rest was up to you."³⁴ Because of his lifelong study of military affairs, Patton understood the value of a well-functioning staff and how cultivating personal bonds of trust with the staff could make them agents of the commander's vision.

Patton's Headquarters Feedback Mechanisms

From the first, Patton worked to build a culture focused on improving performance. He established both formal and informal structures for capturing performance feedback, and also encouraged experimentation and inquiry. Underpinning all these structures and processes was an open-minded culture that prized self-criticism and growth. In total, Patton set the tone for organizational learning within Third Army by creating robust feedback loops.

Upon assuming command, Patton immediately put in place informal feedback mechanisms. One of his first actions was to mandate that one officer from each staff section of Third Army and its subordinate corps would visit line units daily and report any vital information to the chief of staff immediately upon returning. The commanding general or chief of staff was required to do so as well.35 This requirement helped create vital personal relationships and understanding between combat units and Army-level staff.³⁶ The reverse was also standard. In line with his instructions to keep Third Army's soldiers informed, Patton welcomed front-line troops around the headquarters. Colonel Allen, Deputy G-2, remarked that "groups of tankers and doughboys, with hand grenades dangling from their lapels and the reek of battle still fresh and pungent on them, were a common sight in the War Room. That was never seen at any other Army Headquarters."³⁷ Patton's emphasis on maintaining direct connectivity between his staff and actual battlefield realities ensured that he was not isolated from combat performance. These traits allowed Third Army to identify performance gaps or trends that required further analysis. Because of the direct connection between senior staff or commanders and the problems on the ground, Third Army could apply additional urgency to resolve performance shortfalls.

Formalized performance feedback began almost immediately as well. For example, understanding that Patton intended to plan not just for Third Army's initial entry onto the continent but potentially a series of operations taking Third Army to the German border, the G-2 section began

holding planning sessions. Following these sessions, the section produced memoranda concerning progress and problems still unresolved then submitted these memoranda to the chief of staff. The G-2 presented the first of these reports on 4 April, just twelve days after the headquarters arrived in the United Kingdom.³⁸ The formal and informal feedback mechanisms and the emphasis on capturing performance data helped Third Army close some of the gaps between the Army and frontline realities.

Patton also built a culture from the top down that encouraged experimentation and underwrote the failures that accompanied it. While Patton demanded the highest performance and had no tolerance for the incompetent or lazy, he understood that professional and organizational growth often entailed setbacks. This recognition set him apart from other US Army senior leaders at the time, like General Omar Bradley. In July 1944, Patton noted:

[General James Lawton] Collins and Bradley are too prone to cut off heads. This will make division commanders lose their confidence. A man should not be damned for an initial failure with a new division. Had I done this with Eddy of the 9th Division in Africa, the army would have lost a potential corps commander.³⁹

Patton's style set the tone within Third Army and encouraged disciplined initiative and risk-taking. This tone encouraged experimentation and organizational growth. All Third Army leaders understood that well-considered good-faith efforts, executed aggressively, would not earn the commander's ire.

Unsurprisingly, Third Army headquarters was remarkably flexible, self-critical, and open-minded. Patton encouraged "frank and open discussion before he made a decision."40 He also was quite open to suggestions or ideas regardless of their source. He recognized that innovative concepts and ideas could often come from those who directly experienced the problem at hand. Thus, in contrast to other American general officers at the time, Patton regularly was briefed by enlisted men.⁴¹ The reason behind this openness and flexibility was Patton's obsession with efficiency. He and his core staff officers wanted to build Third Army into the most efficient fighting machine. According to Colonel Wallace, this "spirit permeated the whole organization. You had the feeling that Third Army was going in only one direction-forward."42 Patton promoted both formal and informal feedback, encouraged experimentation, tolerated failure, and fostered an environment of open inquiry and self-criticism. This environment encouraged learning and primed Third Army for rapid adaptation in the summer of 1944.

Conclusions

Through the spring of 1944, Patton and his coalition worked tirelessly to form the "Lucky" culture, the first step to actualizing Patton's vision for the battle in France. Unlike some of his contemporaries, Patton had an intuitive grasp of operational art and recognized that decision-making speed and execution speed were central to campaigning. He also understood that to gain the initiative, anticipate decisions, extend his operational reach, and "keep the enemy rocking," he needed to generate information advantage. Yet Third Army in the spring of 1944 was untested and lacked the forces, staff structures, and processes to create that advantage in a high-tempo mobile campaign. Consequently, Third Army needed to adapt, and Patton focused on forming a culture that embraced and encouraged change.

Patton formed the foundation of a military culture that promoted adaptation by creating organizational urgency, establishing robust feedback loops, and welcoming diverse expertise. Patton's clear and direct personal leadership style allowed him to articulate a vision for change that resonated on intellectual and emotional levels. His reputation as an innovator also helped him to present himself as an agent for change. He was able to form a coalition dedicated to actualizing his vision and created a sense of urgency for change within Third Army. Patton also established an environment that encouraged experimentation, promoted self-criticism, and did not punish reasonable efforts to improve the organization. Additionally, he and his staff adopted well-designed methods for gathering informal and formal performance feedback across the Army. These efforts created a system of feedback loops within Third Army that enabled organizational learning. Finally, Patton encouraged the consideration of multiple points of view and actively promoted diversity of thought, believing that diverse expertise and creative friction could spark new ideas and make groups more than the sum of their parts. Within this context, Third Army's experts worked to build unique formations and restructured Third Army's staff and staff processes to generate information advantage in the summer of 1944.

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Chapter 4 Building the Information Forces: March–July 1944

Every single man in the Army plays a vital role. Every man has his job to do and must do it.

-Lt. Gen. George S. Patton Jr., The Patton Papers

Over the spring and early summer of 1944, Third Army adapted its forces, processes, and staff structures to actualize Patton's vision for information advantage and better align with realities on the continent. To protect friendly information, Third Army began to align staff elements and processes to better secure Third Army's communications from the enemy. To attack enemy decision-making processes and deny the enemy the use of information, it developed an integrated structure for leveraging capabilities like deception. Finally, and most importantly, Third Army needed to build forces and information pathways to enable rapid friendly decision-making. Third Army had only a few months to identify creative ways to align its capabilities to efficiently conduct information advantage activities in an integrated and comprehensive fashion. Despite the challenges, the unique military culture within Third Army enabled it to repurpose existing forces, restructure functional responsibilities, and invent new processes to generate information advantage.

Protecting Information and Denying it to the Enemy: The Signal Intelligence Service

Since Allied plans retained Third Army as an exploitation force in France, the first order of business was to develop ways to protect friendly information. A large part of this effort was the responsibility of Maj. Charles W. Flint and the Third Army Signal Intelligence Service (SIS). Doctrinally, the SIS was responsible for "the performance of certain signal intelligence activities . . . the supervision of signal security, and for the preparation and issue of certain cryptographic and other equipment used by the command."¹ Originally five officers, including Flint, and eleven enlisted personnel, the SIS rapidly expanded as it took on a progressively larger mission related to communications security, intelligence collection, and military deception.

Within twenty-four hours of Third Army's activation in England, the SIS began communications security monitoring of Third Army radio networks. Lacking a dedicated organization for monitoring, SIS directed the army-level 118th Radio Intelligence (RI) Company to use four receivers for communications security monitoring and instructed each corps-level Signal Service Company (SSC) to maintain two receivers for monitoring.² According to Field Manual 11-22, *Signal Corps Field Manual: Organizations and Operations in the Corps, Army, Theater of Operations, and GHQ Signal Operations in the Corps and Army*, these radio intelligence companies were tasked with obtaining:

- 1. Signal intelligence by intercepting enemy radio transmissions, and finding positions of enemy radio stations.
- 2. Signal security information by intercepting friendly radio transmissions.
- 3. Information as to unauthorized radio stations by intercepting radio transmissions and finding positions of such stations located in areas controlled by friendly forces.³

The 118th RI Company activated in April 1942 at Fort Sam Houston, Texas.⁴ Like most radio intercept and signal service companies, the 118th RI Company was almost entirely of civilian-non-regular army-soldiers from across the country. The War Department manned these units with more highly educated soldiers, particularly ones with a technical background. Thus, many of the men of the 118th RI Company were trained civilian radio operators who studied at schools like Coyne in Chicago; DeVry in Kansas City, Missouri; and National Schools in Los Angeles.⁵ Others were recent college graduates or had dropped out of undergraduate studies to volunteer.⁶ Many came from immigrant families and were fluent in German, French, and other languages.⁷ Almost universally, they were a highly intelligent and motivated group.⁸ Under the command of Capt. Clarence Helland, the 118th RI Company arrived in England in January 1944. In April, the 118th RI Company was assigned to the Third Army and began monitoring both friendly and German traffic near Dartford in Kent.9 The 118th RI Company was a diverse set of talented, though inexperienced, personnel.

The Signal Service companies, consisting of 8 officers and 120 enlisted men, were assigned to support corps with radio intelligence. At the direction of SIS, they provided communications security monitoring for their assigned corps. While the SSC mission was identical to an army-level RI company, the soldiers divided their effort with the Signal Service companies, concerning themselves primarily with lower-echelon enemy communication systems. The 3253rd SSC was assigned to XV Corps, 3254th SSC to VIII Corps, 3255th SSC to XII Corps, and 3256th SSC to XX Corps.¹⁰ Most began their communications security monitoring mission by mid-April.



Figure 4.1. Soldiers of the 118th RI Company, Dartford, Kent, May 1944.

Source: John W. DeGrote, "The 118th Signal Radio Intelligence Company, 1942–1946, Third US Army, World War II," n.d., 24, Marshall Foundation Library and Archives, Lexington, VA.

Since the 118th RI Company and the Signal Service companies were designed primarily to conduct radio intelligence missions, they initially received minimal training on communications security monitoring. The companies also lacked practical experience in conducting actual radio intelligence missions, so the SIS tasked them with security monitoring to improve their technical proficiency with intercept equipment. Over the spring and summer, the SIS assisted the companies in training for the mission in France and refined their communications security and radio intelligence procedures.¹¹

In addition to security monitoring, SIS progressively took on additional information security functions within Third Army, including working with counterintelligence to identify wiretapping attempts.¹² Similarly, starting in April, SIS took the lead on procuring medium-grade cryptographic systems then in May began distributing these systems and started work on special codes and ciphers for the headquarters.¹³

Starting in the spring, SIS also assumed direct supervision of the Code Room, a subordinate office of the Third Army Message Control Center. Overall, the Message Control Center was responsible for "coordinating the transmission of outgoing orders, reports, and other messages

with the available signal agencies, and expediting the delivery of incoming messages."¹⁴ Within the Message Control Center, the Code Room was responsible for "cryptographing and decryptographing of messages."¹⁵ While in England, the SIS stipulated that all messages sent by teletype be encoded, even though Supreme Headquarters Allied Expeditionary Force (SHAEF) did not require it. This decision was in line with Patton's emphasis on using code if the enemy had time to react. This decision would also pay dividends later as SIS prepared code clerks to deal with heavy code traffic demands in France in August.¹⁶

SIS also took the lead on the transmissions portion of Third Army's military deception activities in England. From April to June 1944,



Figure 4.2. Third Army soldiers (probably Code Room personnel) practicing code, circa 1944.

Source: Third United States Army, After Action Report Third US Army 1 August 1944–9 May 1945: Volume II, Staff Section Reports, Signal (Regensburg, DE: May 1945), 31, Combined Arms Research Library, World War II Operational Documents. SHAEF executed a complex military deception plan code-named Fortitude-South (part of the larger Bodyguard deception plan) to convince the Germans that the allied invasion of Europe would occur at the Pas de Calais. According to the deception, this assault would be led by Patton and spearheaded by the fictional First US Army Group.¹⁷ To increase the verifiability of this narrative, SHAEF designed several deception operations aimed at German intelligence. Operation Quicksilver II, the "W. T. [Wireless Transmission] Plan," mimicked the day-to-day radio signature of the fictional First US Army Group as it supposedly prepared for the invasion.¹⁸ Elements of the US Army's 3103rd Signal Services Battalion and the British Army No. 5 Wireless Group dispersed throughout southeast England to transmit fictitious radio traffic.¹⁹ The scripted transmissions ranged from readiness reports to unit movements and even personnel actions. All the transmissions used weak codes and encryption to ensure they would be broken.²⁰

The SIS entirely managed Third Army's participation in Quicksilver II, and throughout May and June, controlled the opening and closing of Third Army Radio nets to confuse German traffic analysis.²¹ As Third Army prepared to embark for the continent, operational plans codified the SIS role in denying enemy use of information. Plans specified that "radio counter-measures (deception and jamming) will not be employed by troops of Third US Army unless specifically directed by the Signal Officer, Third US Army."²² As the Signal section's executive agent, the SIS would be primarily responsible for synchronizing radio countermeasures and integrating these effects into Third Army operations for the remainder of the war.²³

Over the summer, SIS gradually assumed responsibility for additional ancillary information forces. On 28 April, SIS received Det ZY of the 21st Mobile Weather Squadron, and in May, the Signal Section assigned the SIS a small photographic detachment from its Captured Documents Department to the SIS. This detachment's mission was to photograph captured German documents and devices with cryptologic value to enable radio intelligence collection.²⁴

By May, SIS responsibilities had expanded significantly to include:

- Protecting friendly information by monitoring communications security and distributing cryptographic materials.
- Enabling decision-making by providing combat information and intelligence.
- Disrupting enemy decision-making through radio deception.

While it did not execute the function in England, the SIS was assigned responsibility for denying the enemy the use of information through jamming. These activities were clearly in line with Patton's vision of information advantage: protecting friendly information to prevent the enemy from acting first or regaining their balance. Yet, SIS was not able to provide Patton with information about the friendly situation to support faster and better decisions, synchronizing his forces during high-tempo operations through superior understanding.

Enabling Decision-Making: Army Information Service

Patton and Col. Elton Hammond, his handpicked Signal officer, identified part of the solution to his problem of maintaining situational understanding and enabling decision-making in a high-tempo operation: Signal Information and Monitoring (SIAM) companies (also referred to as Staff Information and Monitoring companies). US Army SIAM companies were an American adaptation of British Phantom patrols. During the Battle for France in 1940, the British Expeditionary Force had significant difficulty maintaining situational awareness of the location and activities of its forces in combat. During the dynamic and fast-paced campaign, information passing through normal command channels often was overcome by events before it reached the British Expeditionary Force Headquarters. So, the British Expeditionary Force adapted the structure and processes of the Hopkinson Mission, a small air-ground liaison team, to create the General Headquarters Liaison Regiment.²⁵ These Phantom liaison patrols, also referred to as J Service, served with British Eighth Army in Tunisia. They monitored lower-echelon radio networks for communications security infractions and information of value, then passed that information directly to Army headquarters—bypassing normal channels.²⁶

Patton first observed the value of J Services in Africa in 1942 and had his first practical experience with the concept in the summer of 1943. In the leadup to Operation Husky, Allied Force Headquarters provided two British J Service officers for Patton's Seventh Army.²⁷ This team served Seventh Army well during the dash across Sicily. While skeptical of the British and British intelligence, Seventh Army's experience with J Service contributed to Patton's understanding of how to enhance situational awareness by employing information forces.

In April 1943, General Lowell Rooks, Allied Force Headquarters G-3, directed the formation of a provisional "American Staff Information Intercept Organization" under Fifth US Army.²⁸ Similar to J Service, this company would monitor communications security and speed combat information to Army headquarters while also providing situational awareness to adjacent units through information broadcasts.²⁹ In the summer of 1943, Fifth Army, then training in North Africa, stood up the 6689th Staff Information and Monitoring Company (Provisional) and began training on



Figure 4.3. Example of SIAM Communications Structure.

Source: John S. D. Eisenhower, "The Army Tactical Information Services," *Military Review* 29, no. 5 (August 1949): 34.

British J Service methods.³⁰ When eventually deployed to Italy in the fall of 1943, the 6689th focused primarily on monitoring radio networks for information of value and communications security violations and retransmitting information they passively gathered.³¹ Also, Fifth Army began experimenting with adding liaison officers at the division level to supplement the information gained from radio intercepts.³² While this was secondary to the primary SIAM radio monitoring effort, these fall 1943 experiments likely influenced Third Army's approach the following year.

The reports of Fifth Army's late 1943 success with the provisional SIAM company in Italy and Patton's own experience with J Service in Sicily likely contributed to his decision to develop a SIAM company tailored to Third Army's requirements in France. Patton, ever the student of history, no doubt was familiar with the "directed telescope" concept for commanders to use liaisons as their eyes and ears across the battlefield.³³ Thus, Patton likely viewed Fifth Army's experiments with division-level SIAM liaison officers with great interest. Patton understood how the J Service and SIAM systems could enhance situational understanding and increase decision-making and execution speed.

Seeking to improve on Fifth Army's system, in early 1944, Colonel Hammond tasked Major Flint and the SIS to recommend methods to enable common situational understanding, rapid decision-making, and Army-wide synchronization.³⁴ Major Flint dispatched one of his junior SIS officers to visit the British Phantom regiment for two days researching British organization and methods.³⁵ Based on lessons from the British and 6689th SIAM Company in Italy, Major Flint developed a proposed table of organization and equipment for a SIAM company and submitted it to SHAEF in April.³⁶

By spring, the War Department, convinced of the merits of the SIAM concept, determined that each US army in the European Theater should receive a SIAM company before deploying to France. Yet, despite Colonel Hammond and Major Flint's best efforts to accelerate the design and procurement process, Third Army would likely not receive its company for some months and would almost certainly deploy to France without one.³⁷ Recognizing the critical capability gap if the army deployed without a SIAM, Third Army modified a cavalry group into a SIAM. Drawing on its research into the British J Service and Fifth Army, the SIS worked with Third Army G-2 and G-3 to generate a basic concept to employ a cavalry group as an information service.³⁸ In one of the first significant departures from the original SIAM construct, Third Army retained the communications security monitoring mission with the 118th RI Company and Corps Signal Service companies under SIS supervision. Third Army initially identified the 2nd Cavalry Group for the mission but eventually selected the Fighting 6th.39

In the spring of 1944, the 6th Cavalry Group (Mechanized), under the command of Col. Edward M. "Joe" Fickett, was stationed near Armagh, Northern Ireland, assigned to XV Corps.⁴⁰ Typical for a mechanized cavalry group in World War II, 6th Cavalry Group consisted of a headquarters element and two non-organic cavalry squadrons. Lt. Col. Tom Matlock commanded the 6th Cavalry Squadron, and Lt. Col. Walter Day commanded the 28th Cavalry Squadron. The squadrons consisted of three reconnaissance troops, a light tank company, and an assault gun company. The reconnaissance troops were comprised of three platoons organized as an Armored Car section with three M8 Greyhound armored cars and a Scout section with six Jeeps.⁴¹ All told, a squadron had 31 officers, 2 warrant officers, and 721 enlisted men.⁴²

Though the 6th Cavalry Group had arrived in Northern Ireland in 1942, earmarked for Operation Torch, the group had not participated in Mediterranean Theater operations because of insufficient shipping.⁴³ Instead, they spent two years training, conducting countless field and com-



Figure 4.4. Sixth Cavalry Group (Mechanized) commanders during World War II: Col. Edward M. "Joe" Fickett (left) and Lt. Col. James H. Polk.

Source: Ellsworth B. Crowley, *The Fighting Sixth: History of the 6th Cavalry Regiment, 1861–1960* (Dallas: Military Publications, 1961).

mand post exercises.⁴⁴ Colonel Fickett was a veteran cavalryman commissioned in 1917.⁴⁵ His experience had given him a particular vision, and he emphasized to the 6th Cavalry Group that "good communications is the guts and essence of cavalry reconnaissance and if every soldier in the group were a qualified [radio] operator, there still wouldn't be enough."⁴⁶ Accordingly, the 6th Cavalry Group trained extensively on radio operations; by the summer of 1944, its soldiers were widely regarded as some of the best radio operators in the theater.⁴⁷ The 6th Cavalry Group maintained a minimum of three operators per radio, trained in radiotelephone procedures and capable of operating code at upward of twenty to thirty words per minute.⁴⁸ All told, the well-equipped, exceptionally well-led, and communications-savvy 6th Cavalry Group was the solution to Patton's SIAM problem.

Third Army's Army Information Service (AIS) was born in May 1944. As would be the case throughout the campaign, events progressed quickly. The 6th Cavalry Group transformed into an information service, deployed to the continent, and went into combat in less than eighty days. Between 11 and 13 May 1944, the 6th Cavalry Group moved from Northern Ireland to Gloucestershire County in southwestern England, where it collocated with Third Army Headquarters.⁴⁹ Then on 16 May, Patton "directed Sixth Cavalry Group to establish a channel, both physical and technical under Army control to make and report frontline G-2 and G-3 information direct to the Army Advance Command Post, bypassing normal communications channels."⁵⁰

On 18 May, Third Army reassigned 6th Cavalry Group from XV Corps to Headquarters, Third Army. On 20 May, Patton briefed Colonel Fickett and his staff on the 6th Cavalry Group's new mission.⁵¹ Patton believed both time and detail would be lost in transmitting messages back to Army Headquarters through normal channels.⁵² The AIS would enable enhanced situational understanding at the operational level, by operating a "rapid communications channel, bypassing normal command channels, under Army control, direct from front line units to the Army Command post," monitoring "friendly battalion, regiment, division, and reconnaissance unit radio nets," and running a "system of patrols of combat posts and observation pots of battalions and regiments," while maintaining "periodic contact with division G-2 and G-3 to exchange information."⁵³

The AIS would directly report reconnaissance and intelligence information to the G-2 and friendly force information to the G-3.⁵⁴ On behalf of the Signal section, the SIS would exercise technical direction of the AIS and provide guidance on methods of procedure, employment, and coordination.⁵⁵ Yet, Fickett and the AIS were ultimately responsible directly to Patton for the mission's success.⁵⁶ The AIS was crucial to Patton's information advantage approach, allowing him to have superior situational understanding and ultimately make decisions faster than his enemy. Consequently, Patton was deeply involved in the creation and success of the AIS but, as was his style, did not dictate how Colonel Fickett was to transform 6th Cavalry Group. Instead, Patton articulated his vision then allowed Colonel Fickett and his expert staff to generate options.

Colonel Fickett and the group operations officer, Maj. Thomas H. Stewart III, wasted no time generating a plan to transform the group into an information force. Per Patton's directive, only one of the two squadrons within the 6th Cavalry Group would serve as the AIS at a time.⁵⁷ Group headquarters would maintain overall responsibility for the AIS mission. The squadrons would alternate between serving as an army-level reconnaissance element and a force provider for the AIS patrols.58 Colonel Fickett and Major Stewart determined that a minimum of thirteen self-sustaining detachments were necessary to accomplish the mission. Nine platoon-sized information detachments would be assigned to the division level, and four small supplementary detachments, consisting of troop headquarters, would be assigned to the corps.⁵⁹ To ensure messages were rapidly relayed to the AIS Headquarters, the original plan placed each detachment directly under the group headquarters. The troop headquarters served as nothing more than another detachment. Each detachment would communicate directly with the AIS command post.60

Each divisional information detachment consisted of two officers and forty enlisted men. Detachments were further subdivided into a command and monitoring section and a patrol and liaison section, each led by a lieutenant. The monitoring section included a message center, three monitor stations, a communications link to the rear, a command post, and a security detail. This section was tasked with monitoring radio traffic within the assigned division and transmitting relevant combat information within the division to the AIS headquarters. The patrol and liaison section was tasked to move with forward elements and communicate timely information regarding the forward line of troops and the overall combat situation.⁶¹ These detachments could be assigned to various types of divisions, with different task organizations operating in a variety of roles, and so Colonel Fickett and Major Stewart ensured the detachments were as flexible as possible.⁶²

It became quickly apparent that its table of organization and equipment would not support 6th Cavalry Group's newly assigned role. The AIS required additional motorcycles, jeeps, and long-range communications equipment. So, Fickett and Stewart coordinated with Major Flint and requested new equipment from HQ European Theater of Operations based on the SIAM table of organization and equipment recommended in the spring.⁶³ SIS also coordinated the procurement of cryptographic systems to ensure the AIS's communication security.⁶⁴

Additionally, Fickett and Stewart developed a training plan to transform the Cavalry Group's operations into those of an information service. The first phase consisted of officer training, which would orient the officers to the AIS construct, educate them on armored and infantry division operations, and train them on radio and wire communications. The second phase would be a communications exercise at reduced distances to test the AIS construct and adjust the provisional organization and manning. The training would culminate with a pair of two-day field exercises. One squadron would serve as the AIS and the other squadron would role-play as a variety of regimental through corps headquarters.⁶⁵

On 12 June, Patton approved the AIS plan, code-named Unicorn, and Fickett immediately implemented the intensive training program, which lasted the rest of the month.⁶⁶ The first phase of the training occurred as planned, but the communications exercise was largely a failure because the requested communications equipment had not arrived and Third Army was under strict radio silence orders. Because of these deficiencies, 6th Cavalry Group canceled the third-phase field exercise.⁶⁷ Undeterred, the soldiers continued to train on the AIS/SIAM concept and radio procedures for the new system with the SIS's assistance. At the behest of SIS, the

301st Signal Operations Battalion conducted a three-week special course in June that trained wire crews, wire chiefs, teletype operators, and switchboard operators for the new AIS.⁶⁸

To establish connectivity between the Third Army Headquarters and the information detachments in the field, Flint worked closely with Fickett and Stewart to create processes and a facility for receiving information. Flint equipped a van with communications equipment and two teletypewriters to serve as both the SIS headquarters and an AIS information center.⁶⁹ This information hub would process and route signal intercepts and communications security violations to the G-2 and Signal officer from the 118th RI Company and corps-level Signal Service companies. The hub would also process and route combat information and intelligence from the AIS patrols to the G-2 and G-3.70 In late June, just days before Third Army was scheduled to embark for Normandy, the AIS finally received its requested equipment, including motorcycles, jeeps, wire communications equipment, and the vital SCR 399 radios.71 The SCR 399 AM radio and similar SCR 299 were the Army's primary long-haul communication devices-extending 2,300 miles when operated as a radiotelegraph or shorter ranges as a radiotelephone.⁷² Fickett and Flint understood that these sets would need to function properly in order for the AIS to communicate across the length of Third Army's anticipated area of operations.

With the close connection between the AIS, SIS, G-2, and G-3 sections established, Third Army possessed an effective staff structure for integrating capabilities and managing information advantage activities. The AIS combined multiple missions to enable decision-making, providing the commander with assured access to the most relevant real-time information. The brainchild of Patton and Hammond—designed by Flint—the AIS complimented SIS functions. The SIS protected friendly information through security monitoring, providing cryptographic materials, and operating the Code Room. Together the AIS and SIS enhanced and assured Patton's operational-level decision-making.

Overcoming Change Resistance and Locking in Gains

There was significant resistance at first to the AIS construct within the 6th Cavalry Group, subordinate corps and divisions within Third Army, and even the Third Army staff. Unsurprisingly, 6th Cavalry Group soldiers saw themselves as cavalrymen first, part of the Fighting Sixth, a unit with a combat history that stretched back to 1861.⁷³ Both officers and enlisted men were disappointed that they would be performing informational instead of combat roles.⁷⁴ Even Lt. Col. James H. Polk, who assumed temporary command in July after Fickett suffered an injury in June, expressed some dissat-


Figure 4.5. Third Army communications van, circa 1944 or 1945—similar to an AIS or SIS.

Source: Third United States Army, After Action Report Third US Army 1 August 1944–9 May 1945: Volume II, Staff Section Reports, Signal (Regensburg, DE: May 1945), 30, Combined Arms Research Library, World War II Operational Documents.

isfaction with the arrangement: "We are not out of the war nor are we in the front lines. Elements are in and out. . . . Not a lot of glory."⁷⁵ There was an initial sense within the 6th Cavalry Group that employing a fully manned, well-equipped, and highly trained formation as an information force was a "waste" of a cavalry group.⁷⁶ Yet, the later high performance and ingenuity displayed by AIS members suggests that Patton won them over.

In April or May, Patton began giving his famous speech to assembled troops, stressing "fighting and killing."⁷⁷ While there was no set script for the address, he usually highlighted that "every single man in the Army plays a vital role. Every man has his job to do and must do it."⁷⁸ Patton would then give examples of the critical role played by soldiers in non-combat roles. There is no record of exactly which version of his profanity-laced speech Patton delivered to the 6th Cavalry Group in Armagh in April 1944; but it reportedly was well received by the enlisted soldiers.

Patton's speech to the 6th Cavalry Group and his close interaction with its senior officers may have helped impart the urgency of their task and the need to serve as an information force. Patton's leadership style appealed to the soldiers on an emotional level, and his ability to translate operational-level requirements into calls for individual action almost certainly helped overcome resistance to performing a non-combat role.

Most corps and division staffs initially viewed the AIS with suspicion. Some officers believed Third Army headquarters dispatched the AIS patrols to monitor and report on their performance.⁷⁹ Furthermore, given that AIS platoon leaders would work with regimental and divisional commanders and AIS troop commanders would work with corps commanders, line commanders no doubt were initially reluctant to cooperate with the lower-ranking liaison officers and support the new system. To overcome this resistance, Patton personally "signed letters addressed to each corps and division commander explaining the Army Information Service and introducing the 6th Cavalry representative concerned."⁸⁰ Again, Patton's targeted intervention helped overcome organizational resistance.

Some of the Third Army staff even resisted the new AIS construct. One explanation offered by Brig. Gen. Robert Williams, a junior 6th Cavalry Group officer in 1944, was that they doubted the value of unevaluated information passed outside of traditional vertical command channels.⁸¹ Unfamiliar with the new concept, they may have seen the new AIS as at best a complication and at worst a threat to their staff functions. And though they respected Patton, some staff elements were skeptical of the need for change.⁸² Because of organizational inertia, some staff members were uncertain whether a cavalry group could successfully function in this manner. Thus, when a mid-August report received through regular channels at Third Army headquarters suggested that Allied forces had captured Brest-an event that had not been reported by the AIS-skeptics on staff viewed it as proof that the concept was flawed. The AIS commander personally radioed the AIS patrol accompanying VIII Corps lead elements near Brest and confirmed that the city remained in German hands. This fact was later confirmed through normal command channels, demonstrating the reliability and accuracy of the AIS.83 Demonstrable successes like these during August, combined with Patton's intervention in June and July, helped convince skeptics and overcome resistance to the radical new concept.

For Third Army to generate an information advantage over the Germans in France, the AIS had to work. In no small part, Patton's vision for a war of aggressive maneuver across France hinged on his ability to maintain superior situational understanding. Resistance to the untested and unproven AIS concept, while natural, threatened Patton's operational approach. Thus at critical points, Patton and his coalition intervened to overcome organizational resistance. They understood how to creatively change the dynamic, generate emotional and intellectual support for the new construct, demonstrate the value of changes, and reassure those skeptical of change. Having created a sense of urgency, Third Army overcame initial resistance to the AIS, helping to accelerate the pace of further adaptation in France.

The new construct experienced its first significant test on 30 June 1944, when Fickett was seriously injured in a car accident in England. He would be in recovery for almost six weeks.⁸⁴ Colonel W. W. Cornog took acting command of the 6th Cavalry Group and moved the unit to France between 9 and 10 July.⁸⁵ Because of the need to maintain secrecy regarding Third Army's presence on the continent, radio silence remained in effect, and the AIS had no opportunity to conduct training on the new radio equipment received at the end of June.⁸⁶ In late July, Polk replaced Cornog, assuming command of the AIS and 6th Cavalry Group "on the run." While an experienced cavalryman, Polk came to the AIS from the 106th Cavalry Group (Mechanized) and had no familiarity with the AIS construct.⁸⁷ Thus on the eve of Third Army's activation, the AIS had a new commander and new equipment with which it had never trained.

Yet Fickett, Stewart, Hammond, Flint, and others succeeded in operationalizing Patton's vision and creating an adaptive, resilient, and effective organization. The AIS members understood their mission and its importance to Patton's information advantage approach. Many of these welltrained professionals had actively worked to operationalize the information service concept and transform 6th Cavalry Group. At its core, the AIS was a flexible organization capable of adapting to changing conditions. Thus, while no one knew the AIS construct better than Fickett, his direct leadership was ultimately less important than the adaptive and performance-oriented culture that he and Patton had built in the 6th Cavalry Group.

Conclusions

From March through July, Patton and his staff drew on the lessons from the Mediterranean and exercises in the US to build information forces that could compete in France. The expansion of SIS responsibilities reflected that Third Army leadership understood the importance of protecting friendly information and denying the enemy the use of information. Operation Fortitude and Quicksilver II presented misleading information, helping to unbalance the enemy. Securing friendly information promised to ensure it never regained balance. The creation of the AIS reflected Third Army and Patton's recognition of the need for up-to-date and relevant friendly force information to "keep the enemy rocking." Patton's coalition designed the AIS to increase situational awareness and enable speedy decision-making and execution. The close relationship between the SIS and the AIS reflected Patton and his staff's view that these elements existed within the same overall framework and ultimately supported the same goal of generating information advantage—even though they performed different activities.

While not yet battle-proven, the changes increased Third Army's military effectiveness in the lead-up to operations on the continent. From March to July, Third Army made great strides in integrating capabilities coherently as part of information forces. The SIS progressively assumed greater responsibility from both the G-2 and Signal sections for identifying, securing, obscuring, and defending friendly information and information systems from compromise. The SIS also assumed some responsibility for denying enemy information use, leading Third Army's participation in radio deception operations. The creation of the AIS also helped enhance understanding and assure processes for decision-making. As of July, though, the project of integrating all available capabilities into these activities remained incomplete.

The close relationship between the AIS, SIS, G-2, and G-3 meant that, to a large extent, information, intelligence, cryptologic, logistical, and other support functions were well integrated. While the work was taxing, the SIS effectively procured and distributed cryptographic materials and systems across Third Army, streamlining the process and reinforcing its role as a trusted and interested agent. On the other hand, strategic intelligence support was not well integrated into the system. Similarly, there was no organic relationship between the Signal Service companies, the 118th RI Company, and the SIS; they were not entirely integrated.

The creation of the AIS represented a remarkable alignment between operational concepts and available technology. Third Army planned to offset communications and information technology shortfalls with liaison and human initiative. The primary AIS function was to bridge the communications and information processing gap, speeding information to the army commander and facilitating situational awareness and rapid decision-making. Third Army's unique adaptation of the SIAM construct was a tacit acknowledgment of technology limitations for Third Army and a strategy to overcome an intermittently connected and bandwidth-limited environment.

Finally, and perhaps most importantly, Third Army's information forces were extraordinarily mobile and flexible because they were built on a cavalry group and expeditionary RI company. Fickett and others designed them to be organizationally flexible.⁸⁸ Third Army's information forces entered combat with established systems and processes but recognized that virtually all constructs were subject to change based on conditions in France. Patton, Fickett, and others intuitively understood that the nature of the conflict in France would change based not only on mission requirements but on how the Germans reacted. The only way for Third Army to gain and retain an advantage was to build formations that could adapt to changing conditions.

Over only a few months, Third Army made sweeping changes in how it managed information; the resulting increase in effectiveness was not the result of random chance. When inertia, institutional biases, and other obstacles threatened to impede progress during the preceding months, Patton and his coalition's urgency, the presence of feedback loops, and the work of a diverse set of experts overcame them.

Patton's vision for information advantage created organizational urgency and drove adaptation in Third Army over the spring and summer of 1944. Patton certainly positioned himself as an agent of change, writing before entering the theater that "new ideas are what are winning this war."⁸⁹ Patton described his vision for combat in France and clearly articulated how information advantage could help achieve this. He also identified performance gaps and the need for "each man [to] do his job." Notably, Patton engaged the hearts of Third Army soldiers as well as their minds. He created a small privy council of individuals who shared his vision and employed them to drive change. These senior staff officers further extended the coalition, drawing in subordinate leaders like Fickett and Flint, empowering them as change agents. Critically, Patton never lost touch with the progress he was trying to achieve in Third Army. At vital points, Patton and his coalition intervened to overcome resistance to the new concepts and organizations.

From the outset, Patton built a Third Army culture that emphasized performance feedback and maximizing efficiency above all else. Patton recognized the potential for senior staff and commanders to become insulated from the actual performance of units. Consequently, even before Third Army deployed to France, Patton established informal feedback loops, encouraging army and corps staff to visit frontline units and gather feedback. These interactions created bonds of trust and facilitated the bottom-up flow of information. In addition to these informal structures, Third Army possessed well-developed and purpose-built feedback mechanisms. One illustrative example was the decision to dispatch an SIS lieutenant to visit the British J Service headquarters to gather lessons learned about information service performance. Finally, Third Army experimented with new concepts, collected performance data, and adjusted. The AIS, for instance, was built to be flexible to maximize its performance—adjusting based on results of battlefield experiments with the construct.

Perhaps the most critical contributor to the dynamism within Third Army in the spring and summer of 1944 was the diverse expertise of its personnel. Combining the original Third Army staff with Patton's Seventh Army veterans created a new staff that was forward-looking, flexible, and willing to experiment. Regular army officers with years of experience in the peacetime Army served alongside civilian officers with only a few years of military service. Original Third Army staff had experience with observing, coaching, and training numerous units in the United States. The formerly Seventh Army senior staff brought hard-earned combat experience in North Africa and Sicily.

At the unit level, the SIS and 118th RI Company represented US diversity and talent. Recruited from across the country for their unique language and radio operations skills, these individuals brought diverse perspectives, backgrounds, and talents for an adaptive organization. The primarily civilian SIS worked closely to train and equip the mainly regular army 6th Cavalry Group, helping transform the group into an information service. The cavalrymen themselves were unique in that Fickett had prioritized radio proficiency. The singular and well-adapted AIS organization was created through the combination of the diverse expertise of Flint and his civilian signaleers in the SIS with Fickett and his radio-trained regular army cavalrymen in the 6th Cavalry Group.

When Third Army became operational on 1 August, its members shared a clear vision of how the unit wanted to fight and a clear conception of how information advantage could make that possible. Over the summer, Third Army made great strides integrating its capabilities as part of information forces. The unit likewise aligned its support functions to generate information advantage. Concepts were consistent with available technology, and forces and processes were flexible enough to adjust to realities on the continent. The culture Patton and his coalition built in the spring of 1944 enabled Third Army to digest lessons learned by Allied Forces in Europe and develop new and innovative solutions to the problems it expected to face in France. Thus, when Third Army embarked for the Cotentin peninsula in July 1944, it was ready to rock the Germans back on their heels and adjust to whatever came next. 1. US War Department, Field Manual 11-35, *Signal Corps Intelligence* (Washington, DC: 1942), 2, https://digitalcommons.unl.edu/dodmilintel/113/.

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4. SRH-042, 6.

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9. Army Security Agency. "Histories of Radio Intelligence Units, European Theater, September 1944 to March 1945," SRH-228, Records of the National Security Agency, 2:6, National Archives Control Number NN3-457-83-34, National Archives and Records Administration, College Park, MD, hereafter cited as SRH-228.

10. SRH-042, 8.

11. SRH-042, 2:4.

12. SRH-042, 2:4.

13. SRH-228, 2:7.

14. US War Department, Field Manual 100-5 (1941), 36; and SRH-228, 2:7.

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Chapter 5 Information Advantage in Action: August 1944

Remember, men, you don't know I'm here. . . . I'm not supposed to be commanding this Army, I'm not supposed even to be in England. The first bastards to find out will be the Goddamn Germans. I want them to look up and howl, "Ach, it's the goddamn Third Army and that son-of-a-bitch Patton again!" —Lt. Gen. George S. Patton Jr., *The Patton Papers*

When Third Army activated at 1200 on 1 August 1944, it had already effectively been in operation for a week. First Army's success in Operation Cobra was in part due to Patton's leadership and Maj. Gen. Troy Middleton's VIII Corps. In the following days and weeks, Patton's information advantage approach proved effective and the general's urgent demand for efficiency combined with robust feedback mechanisms and diverse expertise across all echelons enabled Third Army to rapidly adapt to conditions on the continent.

Operation Cobra began on 25 July with the limited objective to break through German lines and seize the town of Coutances. First Army's plan tasked VIII Corps with fixing German elements to the west while VII Corps attacked from northeast to southwest toward Coutances. At General Omar Bradley's direction, Middleton's VIII Corps led with its infantry divisions, making little progress against the Germans north of Coutances. Though he had no official role with First Army, Patton convinced Bradley and Middleton to lead with the 4th Armored Division under Maj. Gen. John Wood and 6th Armored Division under Maj. Gen. Robert Grow.¹ While VII Corps fixed elements of the German 7th Army, VIII Corps punched through the German left flank past the initial Cobra limit of advance, Coutances, and toward Avranches, a key node on routes running south out of the peninsula. Because Third Army remained inactive, on 28 July, Bradley appointed Patton as First Army deputy commander responsible for VIII Corps. The corps would pass to Third Army control once Third Army was activated.² By 1 August, VIII Corps had seized Avranches and was moving south. Bradley viewed Avranches as the endpoint of the operation and the staging ground for subsequent operations to systematically reduce German positions in Brittany to the west after a pause to reorganize and plan.³ In contrast, Patton saw the seized town as the jumping-off point for a grander exploitation to the east.

Sensing the opportunity to exploit the breakthrough on the Cotentin peninsula and turn the battle for France into a more extensive pursuit, Patton pushed both XV and XX Corps—200,000 men and 40,000 vehicles—in column through the narrow corridor at Avranches. This decision risked that both corps would be destroyed in detail if the German 7th Army recognized what was occurring and rapidly oriented on Third Army's exposed flank. At Patton's direction following its July arrival in France, Third Army emphasized security to conceal its presence. Telephone security was a high priority, and total radio silence was enforced.⁴ When Third Army, callsign Lucky, went operational on 1 August, it lifted the radio silence restriction but continued efforts to deny the enemy insight into Third Army operations. Thus, while the operation entailed risk, Third Army possessed an initial advantage.

Even unopposed and undetected, pushing so many elements through such a small "straw" risked delay, and each delay provided an opportunity for the German decision-making cycle to catch up. Furthermore, elements passing through the corridor needed to emerge as combined arms formations ready to continue the exploitation. Bradley noted that this movement was "flat impossible . . . but out the other end of the straw came divisions, intact and ready to fight."5 The Army Information Service (AIS) provided Patton with the situational awareness and assured communications to manage this "impossible" movement effectively. Even before Third Army and the AIS went operational on 1 August, AIS officers had visited First Army units to observe and orient themselves with operations in France. By 1 August, the AIS had positioned its information detachments with their assigned divisions.⁶ Thus at least partially due to AIS preparations for this high-risk movement, Patton had a significantly better understanding of his environment than the German 7th Army. This understanding, in turn, allowed him to take prudent risks. Patton also had uninterrupted decision-making processes and a secure way to communicate his decisions to his subordinates. Because of this capability and his excellent relationship with staff, particularly Generals Hugh Gaffey and Hobart Gay, Patton was able to make rapid decisions, move two corps through the narrow corridor, maintain the initiative, and continue generating information advantage over his enemy.7

By 5 August, Third Army's aggressive maneuver had disorganized German forces across Third Army's area of operations, and the only organized German defense existed near St. Malo.⁸ The VIII Corps 4th Armored Division proceeded toward Vannes at the mouth of the Quiberon Bay, threatening to cut Brittany off from the rest of France. The 6th Armored Division spearheaded the VIII Corps move toward Brest. Meanwhile, XV Corps' 90th Infantry Division secured Mayenne, 79th Division concentrated near Laval, and 5th Armored Division prepared to cross the Mayenne River near Chateau Gontier.⁹ Additionally, XX Corps' 5th and 35th Infantry Divisions and 2nd French Armored Division positioned themselves to cross the Selune River near Vitre, securing crossings over the Mayenne river between Chateau Gontier and the Loire River. From there, XX Corps was poised to sweep east, protecting Third Army's southern flank.¹⁰ By itself, Third Army was now presenting the Germans with multiple dilemmas and threatening Brittany with isolation, the envelopment of forces in Normandy, the seizure of Paris, and a drive to the unprotected German border.¹¹

Particularly characteristic of Patton's operations during August was his continued involvement in military deception to achieve economy of force. In the first days of August, Third Army took part in Tactical Operation B, a military deception operation to convince the Germans that the main allied axis of advance was toward Brittany. German double agents working for the XX Committee provided false reports to the Abwehr, and elements of the 23rd Special Troops presented the signature of additional Third Army units moving into Brittany.¹² While Tactical Operation B was a SHAEF plan rather than a Third Army plan, Patton's continued involvement in military deception operations throughout 1944 is noteworthy. At a minimum, Third Army's participation in Operation Fortitude, Tactical Operation B, and further examples later in the year demonstrate that Patton appreciated the value of using deception to achieve economy of force.

Gaining the Initiative: Ultra

Patton's information advantage approach was remarkably effective in the first few days of August. Communications security, the continued deception regarding Patton's fictional First US Army Group, Third Army's superior situational awareness, and adequate intelligence combined with the rapidity of its advance through the Avranches corridor left the Germans at a substantial information disadvantage. OB West commander Field Marshal Günther von Kluge and his staff were almost entirely ignorant of Third Army's activities and how large a force Patton had moved through the Avranches corridor. The German 7th Army only gained its first real insight into Third Army's operations and its efforts to exploit the breakthrough on 5 August when it began receiving reports of 90th Division at Mayenne, 70th Division at Laval, and mechanized cavalry elements near the Loire. The shock of Third Army's rapid advance and uncertainty regarding its reach further degraded German morale.¹³ Patton's information advantage approach was beginning to come together. To this point, however, Third Army still was not well and truly inside the German decision-making cycle. The missing component to Patton's information advantage approach was special intelligence. This all began to change between 6 and 8 August.

Starting on 20 July, Third Army began receiving Ultra traffic via the British Special Liaison Unit collocated with Third Army Headquarters.¹⁴ The British Special Liaison Unit provided these messages to Maj. (later Lt. Col.) Melvin C. Helfers, the Third Army special intelligence officer responsible for providing Top Secret Ultra briefs to the commander and cleared staff. Helfers was unique among the special intelligence officers within the 12th Army Group. He was proficient in German, a regular army infantry officer, and a 1937 Citadel graduate.¹⁵ In contrast, most special intelligence officers were civilian officers, primarily lawyers, and almost none came from a combat arms background.¹⁶ Initially, Col. Oscar Koch and Patton put little stock in Ultra; Helfers only provided information to Patton and the other cleared staff (Gaffey, Col. Paul Harkins, Col. Halley Maddox, and Col. Robert Allen) indirectly via Koch.¹⁷ Koch admitted after the war that in early August he was skeptical of Ultra because he and Patton had negative experience with British intelligence and specifically British special liaison troops in Africa and Sicily..¹⁸

On the night of 6 August, Helfers provided Patton and Koch with Ultra intercepts from the first week of August indicating that Hitler had ordered all armored units withdrawn from around Caen and assembled in a designated area to attack Mortain. Hitler's plan called for German forces in Normandy to seize Mortain, cut the one American supply route from Normandy to Northern France at Avranches, and destroy all Allied forces south of the Mortain-Avranches area. Third Army Headquarters at the time was south of Mortain.¹⁹ Patton initially believed Helfers's Ultra information but viewed it as a bluff to cover a more significant withdrawal.²⁰ Nevertheless, in response to the warning, Patton halted the 80th Infantry Division, French 2nd Armored Division, and 35th Infantry Division in the vicinity of St. Hilaire so they could contain a German breakout toward Avranches if the attack materialized.²¹ With his information advantage, Patton was able to assess German intent, anticipate subsequent decisions, and place forces to act on the enemy.

On 7 August, von Kluge launched a counterattack toward Avranches spearheaded by the XLVII Panzer Corps, commanded by General Hans Funck. As the Ultra intercepts indicated, this counterattack was to cut the lines of communication between the Cotentin peninsula and Brittany, splitting Third Army from First Army and permitting the subsequent destruction of Third Army's twelve divisions located south of Avranches.²² Three Panzer divisions formed the initial echelon of the counterattack force, pushing westward from the Mortain area toward an initial objective along the Brecey-St. Hilaire road. A second echelon consisting of the 1st SS Panzer Division would exploit the anticipated breakthrough and capture Avranches.²³ First Army's VII Corps, particularly the 30th Infantry Division, bore the brunt of this attack, blunting the German drive toward Mortain.²⁴

Aware of the location where von Kluge had massed German armor, Patton directed XV Corps under Maj. Gen. Wade Haislip to proceed southeast along the German flank toward Le Mans. On 9 August, Patton ordered XV Corps to change its axis of advance from west-east to attack southnorth and capture Alencon.²⁵ With the attack toward Avranches defeated by First Army, the XV Corps hook to the north imperiled the German salient near Mortain. Threatened with encirclement, on 13 to 14 August, the German XLVII Panzer Corps began attempting to extricate itself from the closing Falaise pocket. Unfortunately, the Allies ultimately failed to seal the pocket and prevent the German 7th Army from escaping.

One reason General Bradley provided for not extending XV Corps to Falaise and completely encircling the German 7th Army was his fear that XV Corps could not contain "nineteen stampeding German divisions."26 Yet, the withdrawal forced the German elements to abandon their wire and telephone communications and rely primarily on radio communications, providing SIS and the 118th RI Company numerous opportunities to generate tactical signal intelligence, exploit the initial success, and "keep the Germans rocking." With the Lucky forward command post and 118th RI Company near Le Mans, the 118th RI Company began intercepting field code transmissions associated with armored formations on 14 August. The 118th RI Company decrypted the communications, which indicated an armored unit was attempting to penetrate Third Army's enveloping lines. The 118th RI Company's direction finders provided the location of the formation.²⁷ In response, XV Corps blocked approximately fifty armored vehicles moving southeast from the Foret d'Ecouves; over the next day, the 79th Infantry Division destroyed the remaining isolated German armor elements.²⁸ Strategic intelligence set the conditions for tactical success on the ground, subsequently creating conditions to exploit enemy information systems, resulting in further success.

The 118th RI Company success was despite a significant setback just days before. During Third Army's 9 August effort to envelop the German 7th Army, the company commander, Capt. Clarence Helland, and motorpool platoon leader, Lt. Victor Young, were seriously injured in a jeep



Figure 5.1. The 118th RI Company's "Able" Direction Finding Unit set up direction-finding equipment near Avranches, 6 August 1944

Source: John W. DeGrote, "The 118th Signal Radio Intelligence Company, 1942–1946, Third US Army, World War II," n.d., 56, Marshall Foundation Library and Archives, Lexington, VA.

accident and had to be evacuated to England.²⁹ The intelligence platoon leader, Lt. Gerald Goulette, died in the same accident. First Lt. George Lieberberg, the company executive officer, took command, and First Lt. Frank Fischer became the intelligence platoon leader. Much like the 6th Cavalry Group overcame losing Fickett, 118th RI Company performance did not suffer in the wake of Helland's departure. The deep bench of diverse expertise across the signals intelligence community at the army level helped mitigate the effects of losing three company leaders. Third Army's commitment to Patton and his vision also likely helped the company absorb the shock, reorganize, and continue its mission.

Despite Patton's continued objections, XV Corps was not permitted to close the Argentan-Falaise gap. Similarly, when Patton recommended on 17 August that Third Army turn northeast and trap the German 7th Army west of the Seine, Bradley refused. Bradley remained focused on gaining territory rather than staying inside the enemy decision-making cycle, keeping the enemy off-balance and unable to regain the initiative.³⁰ Patton recognized that information advantage is situationally dependent, often fleeting, and must be operationalized to gain and maintain the initiative then achieve operational outcomes. Ultimately more than 50,000 German 7th Army soldiers escaped the Falaise pocket.³¹ Despite this failure, Third Army killed or captured more than 135,000 German troops.³² Allen attributed Third Army's success in the first weeks of August to the "effective functioning of command. Intelligence warned the commanders about the impending attack, and commanders acted promptly and aggressively to meet it."³³

Third Army's success in reversing and exploiting the German Mortain counterattack likely convinced Patton's staff about the utility of integrating strategic and tactical capabilities to generate operational advantage. On 14 August, Third Army detached the 3254th SSC from XII Corps in Brittany and reassigned the company as a Third Army asset.³⁴ The decision may have been prompted by growing appreciation for tactical signals intelligence's increasing role in pursuit, and its shortcomings against fixed targets with secure wire networks like the garrisons at St. Malo and Brest in Brittany. Patton also saw how well Ultra fit with his information advantage approach. Patton instructed Helfers that he wanted Ultra briefs every morning. If Helfers received any items of great importance, Patton or Gaffey were to be awakened at "any time day or night."35 From then on, Patton rarely missed an Ultra brief; if he was not able to attend, he received an update at some point during the day.³⁶ Patton was also the only field Army commander who regularly received his daily Ultra brief directly from his special intelligence officer instead of receiving a highlights brief from his G-2 or another cleared staff officer.³⁷

Soon Third Army was looking for ways to utilize Ultra intelligence even more aggressively. Because of increasing traffic volume and demands for Ultra analysis and briefings, Helfers soon needed assistance. Accordingly, 12th Army Group dispatched Maj. Warrack Wallace to assist him from 16 August until the advance began to slow in mid-September.³⁸ While remaining security conscious, Third Army aggressively operationalized Ultra starting in August and through the remainder of the campaign, often going beyond how other commands employed the information.³⁹

Wallace noted that Ultra "often is said to be primarily of strategic value and only useful tactically in a static situation. Perhaps its prime value is strategic, but Patton's use of Ultra in his historic drive across France is a fitting thesis for a tactical epic."⁴⁰ Patton's use of Ultra was unique in that he successfully operationalized strategic capabilities for tactical effects, thereby enabling operational-level maneuver. Where others valued Ultra for indications and warnings, Patton recognized its potential to

facilitate a greater understanding of the Germans across their entire operational depth. Instead of simply leveraging Ultra to prepare for German counterattacks or understand the forces directly facing him, he used it to sequence his actions and weight his efforts to apply sustained pressure against places where the German Army was weakest. The awareness provided by Ultra allowed Patton to assume risk in guarding his flanks; he remarked that Ultra "saved him the services of two divisions in the Third Army drive across France toward Germany in August and September."⁴¹ If anything, 12th Army Group constrained Patton in his ability to operationalize Ultra to assume prudent risk and concentrate his forces on objectives. He continually engaged Bradley about relieving 35th Infantry Division of its responsibility to cover the Army Group's flank along the Loire, noting that he had "studied the 'black market' dope [almost certainly Ultra] intently and could see no hazards there [south of the Loire]."⁴²

When asked for feedback on Ultra in early September, Patton and Koch noted their only complaint was that they wanted more information of general significance, not just strategic warning.⁴³ They appreciated how Ultra contributed to their overall visualization of dynamics across the theater. Because Patton had insight into what the enemy was going to do, he could do it first. Maneuver then facilitated intelligence collection in a virtuous cycle: "Since a retreating army must rely solely on radio communication, there was an abundance of German radio activity, and especially among the desired Panzer divisions."⁴⁴ Because he had a unique insight into enemy intentions, Patton could assume greater risks with his flanks and strike harder and faster. He also had greater insight into his friendly force situation due to the AIS and could prevent the enemy from clawing back insight into Third Army thanks to SIS communications security work. Combined, he continued to generate a distinct information advantage over the enemy, staying inside the German decision cycle.

Third Army's ability to capitalize on Ultra operationally but not become overly reliant on it for warning was due to Patton's genius. He grasped how to leverage this unique capability. Yet, it took Helfers's unique skill set and talent to overcome initial Third Army skepticism about Ultra.⁴⁵ Because of his expertise as both a regular army infantryman and a trained intelligence professional, Helfers was able to not only convince Third Army of the utility of Ultra but also integrate Ultra into Patton's information advantage approach. Contrary to his public persona, once convinced of its utility, Patton easily integrated Ultra into his information advantage concept. For him and Third Army, efficiency mattered above all else.

Integrating Capabilities as Part of Information Advantage

Third Army took additional steps to integrate its capabilities to conduct information advantage activities during the August pursuit. On 16 August, G-2 assumed responsibility for the Psychological Warfare branch and its coordinating role with Psychological Warfare liaisons at the corps level.⁴⁶ The branch was responsible for combat propaganda directed at enemy forces and first-phase consolidation work, or information operations directed at civilians. It operated a radio station, distributed friendly propaganda through various means, and monitored enemy propaganda radio.⁴⁷ Incorporating the branch into the G-2 was a significant departure from 12th Army Group and First Army, which retained their Psychological Warfare branches as part of a special staff section apart from the G-2.⁴⁸

This change brought like functions together in ways that complimented one another and increased efficiency. All radio monitoring was now integrated under the joint control of the G-2 and SIS. Similarly, responsibility for most Third Army capabilities to attack enemy decision-making was consolidated under the same G-2 and SIS structure. Furthermore, the increased integration of SIS, G-2, and Psychological Warfare Branch brought the branch into closer contact with the AIS. The European Theater Board cited access to tactical information through information services like the AIS as being of "paramount importance" to the success of psychological operations.⁴⁹ The ability to attack and manipulate the enemy cognitively was only possible through a deep understanding of enemy intentions provided through intelligence.

As Third Army remained on the offense, the number of captured enemy documents and cryptographic materials increased significantly. The captured materials photographic detachment within SIS exploited these materials and provided the 118th RI Company with insight into German codes and ciphers. The 118th RI Company, in turn, distributed these details to Signal Service companies collecting information at the front. By mid-August, the SIS delegated control of its captured materials photographic detachment directly to the 118th RI Company.⁵⁰ These adjustments allowed Third Army to attack enemy information and generate operational insights more efficiently.

Security requirements that developed from the high-tempo fight in France and the need for efficiency prompted Third Army to further consolidate its cryptographic and signal monitoring functions over the first thirty days on the continent. Third Army brought the SIS Code and Cipher section up to the Lucky forward command post from the rear command post to more efficiently distribute cryptographic materials.⁵¹ To ensure efficient and effective net monitoring within Third Army, SIS also tasked the 118th RI Company to coordinate monitoring between the Corps Signal Service companies.⁵² Finally on 23 August, SIS assumed responsibility for the Third Army Message Control Center; it was only responsible for the Code Room to that point.⁵³ According to US Army doctrine, the message center would speed the transmission of authentic messages by:

- 1. Providing a designated point to which messages and messengers may be directed.
- 2. Keeping informed of the current effectiveness of each available means of signal communication.
- 3. Properly distributing message traffic to the available effective means of signal communication.
- 4. Eliminating unnecessary delays in transmission.
- 5. Operating an efficient messenger service.⁵⁴

By placing the Army Message Control Center under the SIS, Third Army aligned like functions to increase efficiency and execution speed. The SIS was now responsible for monitoring open enemy-and friendly-communications paths, as well as assuring secure and rapid transmission of priority friendly information while simultaneously exploiting enemy communications. Both functions helped ensure that timely, relevant, comprehensive, and secure information flowed to decision-makers. The SIS was also positioned to attack enemy decision-making processes, denying information to and deceiving the enemy by coordinating radio countermeasures throughout Third Army. Integrating these functions under one organization gave Patton the speed of decision-making and execution necessary to generate information advantage. This organizational structure went further than other armies in the European Theater of Operations, which for the most part only arranged for close collaboration between the Message Center and the cryptologic security team.⁵⁵ The unique decision to place the Message Control Center under the SIS arose from Patton's information advantage vision and Third Army's dynamic military culture.

Adapting the AIS into an Information Hunter

The nascent AIS faced challenges during the initial days of August. Operators were not familiar with the new radios and some of the equipment failed, making communications difficult. Moreover, because of the rapid exploitation following the breakout at Avranches and the crumbling of German resistance after the Mortain offensive, the distance between Third Army units increased. AIS-directed motorcycle couriers became the only reliable means of communication with some divisions, particularly the 4th and 6th Armored Divisions speeding west through Brittany.⁵⁶ Furthermore, the number of information detachments had increased from thirteen to fifteen by 6 August. The increasing traffic from the initial detachments combined with even more traffic from the two added detachments threatened to overwhelm the minimally manned and equipped AIS headquarters.

By 15 August, less than two weeks following its initial breakout near Avranches, Third Army had advanced nearly 400 miles from Brest to the Seine River and was now responsible for the north-south frontage from Argentan in Normandy to Orleans on the Loire.⁵⁷ Third Army had seized multiple positions along the Seine River and was threatening to encircle Paris, preventing the Germans from organizing an effective defensive line. The XX Corps 8th Armored Division had reached Chartres southwest of Paris, forcing Hitler to reposition elements of Army Group G from the south to face Third Army. XII Corps had seized Orleans south of Paris, and XV Corps was advancing east of Dreux to the west of Paris. The operations being conducted by mid-August also varied significantly. VIII Corps in Brittany was involved in reducing fixed positions. Elements of XII Corps were blocking the German 7th German Army's escape from the Falaise pocket, while XX Corps and XV Corps troops were driving east in a combination pursuit toward the Seine and also the German frontier. By mid-August, the distances involved in Third Army's operations significantly strained the AIS ability to communicate with its far-flung detachments. Communicating across such distances was challenging; the subordinate corps were too far apart for effective ground wave communication but too close for twenty-four-hour sky wave communications.58 Lucky Forward itself was also moving forward approximately every five days to keep up with the advance, further complicating communications.⁵⁹

Thus, the AIS faced the challenge of supporting these expanding requirements in a battlespace that itself was enlarging by the hour—with limited manpower and communications technology that was unreliable in the field. Because of its flexible structure and the ingenuity of 6th Cavalry Group cavalrymen, AIS could rapidly identify performance shortfalls and adjust its processes and organization to fit the realities of combat in France and Patton's requirements for information.

First, given the shortfalls in communication technology, the AIS developed new ways to get messages through. Its radio personnel generally had three to four years of radio experience, and Fickett's previous emphasis on communications proficiency proved invaluable.⁶⁰ In areas where radio communications were impossible, the AIS began running motorcycle messenger and courier services.⁶¹ The AIS also stood up advanced signal centers when the distance between the Army and Corps command posts



Figure 5.2. Army Information Service motorcycle messenger, 1944.

Source: Robert W. Williams, "Moving Information: The Third Imperative," *ARMY* 25, no. 4 (April 1975): 20.

exceeded sixty miles. These centers relayed messages both by radio and courier and provided AIS headquarters with a central distribution point for information.⁶² In addition to successfully passing information up to Army headquarters, the AIS helped ensure lateral and downward communications and situational awareness. For example, the Third Army G-2 regularly used the AIS to pass intelligence information to lower echelons, noting that "when no other means was available, the AIS could get the information through."⁶³

Second, the AIS made several changes beginning on 15 August to reduce the stress created by the increased number of detachments and maintain situational awareness. The AIS changed its radio procedures to have divisional information detachments report to the supplementary detachments at corps. Corps-level detachments would then assemble information and relay it to the AIS headquarters. The AIS decentralized operational control of the information detachments to the troop headquarters as well.⁶⁴ Finally, the AIS increased the number of personnel in the joint AIS-SIS operations van from one officer and one enlisted man to two officers and three enlisted men.⁶⁵ Third, by 15 August, the AIS abandoned friendly radio monitoring and retransmission entirely—another significant break from the original SIAM concept.⁶⁶ Already the AIS was quite different from other American SIAMs in that it did not conduct the communications security monitoring mission. Previously in March, responsibility for Third Army security monitoring shifted to the SIS. The primary mission for Standard British Phantom patrols and American SIAMs was to monitor and retransmit information of value. Liaison was at most a secondary function. The AIS decision to stop monitoring friendly radio networks and focus exclusively on liaison was a major departure from the core SIAM concept. Patton and other third Army officers explained the genesis of these European Theater of Operations General Board changes after the war. Patton, who chaired the board dealing with the question of SIAMs and information services, concluded:

Information obtained by monitoring is incomplete and sometimes unreliable and must be confirmed by information obtained from other sources. Monitoring isn't a satisfactory means of obtaining tactical information.⁶⁷

By mid-August, analysis of performance feedback at the army level enabled the AIS and Third Army to quickly recognize that monitoring often produced misleading information. They concluded that information provided directly from liaison, particularly with staff at the division level, was the most reliable, with an acceptable time delay. The AIS saw this as an active rather than passive process. Understanding Patton's information requirements at the army level, AIS headquarters could direct the search for information at lower echelons and guide liaison and patrol activities.⁶⁸

Confident in its analysis and to maximize efficiency and improve performance, the AIS promptly reorganized its divisional information detachments. The AIS folded monitoring sections into the patrol and liaison section, with some personnel reassigned to man expanded corps-level detachments.⁶⁹ After additional analysis indicated even this was too large a presence at the division level, the AIS reorganized the divisional information detachments into standard reconnaissance platoons in late August.⁷⁰

These changes across Third Army served to extend its operational reach. Despite losing the 2nd French Armored Division to participate in the liberation of Paris and orders to keep the 6th Armored Division in Brittany, Third Army was still able to seize crossings over the Seine on 21 August before the Germans could react. The XII and XX Corps repulsed local German counterattacks against the Seine bridgehead at Sens, Montreau, and Melun, and Third Army drove east toward the Metz area and the still-unmanned Siegfried line beyond.⁷¹ In the waning days of August,

logistical shortfalls, not information shortfalls, began to hamper Third Army's pursuit to the German border. Despite receiving progressively less fuel, the XII Corps armored spearhead, the 4th Armored Division, reached Troyes eighty miles southeast of Paris on 26 August, overrunning the German defenders; then on 27 August, XX Corps captured Nogent.⁷²

By 29 August, Third Army's gasoline shortage was acute and the advance effectively stalled until 3 September. Third Army was now only 70 miles from the German border, having advanced more than 700 miles in the past month.⁷³ The slowed tempo progressively robbed Third Army of the initiative.⁷⁴ Without the sustained pressure, the German decision-making cycle began to catch up. With progress halted in late August, Third Army could not employ all its capabilities, losing its advantage over the German Army. In early September, German Army Group G began planning counterattacks that would buy additional time to man the Siegfried line. The delay further benefited the Germans as the weather started to deteriorate. Lorraine's terrain also was more disadvantageous to armor, and the autumn weather conditions were less optimal for tactical air support. Thus, when its offensive operations resumed on 5 September, Third Army had substantially less physical and information advantage over the enemy. Perhaps the one bit of early September good news for Third Army information forces was Fickett's return. Recovered from injuries sustained in June, he reassumed command of 6th Cavalry Group and the AIS on 5 September, just in time to lead the organization during the difficult Lorraine campaign.⁷⁵

Conclusion

Throughout August, Third Army adapted to align with Patton's information advantage approach and combat conditions in France. By integrating strategic intelligence, namely Ultra, Third Army recognized what the enemy was doing and could "do it first." More than just defensive warning, Ultra helped offensively, allowing Patton to develop an operational approach that effectively balanced risk while maintaining his tempo. Maintaining the initiative forced dilemmas for the German 7th Army, resulting in greater use of radio over wire transmission and new opportunities for Third Army to exploit German information.

The AIS adapted to enhance Third Army situational understanding, moving away from simply monitoring information to focus on acquiring information that could drive rapid decision-making. In August, the AIS adapted to become a hunter rather than simply a passive gatherer of information. Along with SIS, the AIS adapted its systems and processes for bet-



Figure 5.3. Third Army staff and information forces organization, late August 1944.

Source: Created by the author.

ter decision-making. For example, the AIS established new procedures to ensure information flowed from the front back to the headquarters, and the SIS streamlined its methods to keep information secure from the enemy. Together these adaptations helped Third Army keep the "enemy rocking." Through psychological operations and aggressive pursuit, Third Army exploited battlefield success, degrading German morale and encouraging surrender and desertion.

Third Army's adaptations were militarily effective because they aligned information resources within information forces, integrated supporting functions, ensured operational conceptional consistency with available technology, and emphasized organizational mobility and flexibility. Throughout August, Third Army helped integrate and synchronize its capabilities. The SIS took on progressively more of the mission to protect friendly information systems and processes. By integrating the Message Control Center into its operations, the SIS gained responsibility not only for the physical encoding or encryption of information but the entire process of securing and delivering information to enable assured rapid and assured decision-making by Third Army leaders. Third Army also adapted to integrate its efforts to attack enemy decision-making processes. By organizing the Psychological Operations branch under the G-2, Third Army better integrated psychological operations into the G-2, G-3, SIS, and AIS structure.

The continual use of maneuver to generate opportunities to exploit enemy information represents another kind of less formal capabilities integration. Ultra provided insight that allowed Patton to achieve economy of force. Simultaneously, both aggressive offensive maneuver and military deception attacked German cognitive processes, hampering German efforts to mass combat power and halt Third Army's advance. These information disadvantages were compounding. As the Germans continued to retreat, they were forced to abandon their secure communications and lost control of cryptographic materials, making their information systems and decision-making progressively more vulnerable to compromise and further disruption.

The August changes in Third Army operations also helped integrate support functions into information advantage activities. First, the Psychological Warfare branch realignment provided the support that Third Army needed to attack the enemy cognitively. The direct relationship with G-2 intelligence, radio monitoring from the SIS, and friendly force information from AIS helped the Psychological Warfare branch be substantially more successful. Second, the SIS's decision to bring the cryptographic logistics function forward from Lucky rear improved the efficiency of Third Army information assurance efforts. Finally, SIS's decision to organize the captured documents section directly under the 118th RI Company helped efficiently align support, reducing administrative overhead for the growing SIS while simultaneously aligning a support organization directly with its primary customer. These span-of-control decisions and others balanced the benefits of centralized control with the risk of overextension.

Throughout August, Third Army adapted to better align its approach to information advantage with available technology. Communication difficulties stemming from the limitations of the SCR-399 radio forced the AIS to develop alternate means to rapidly move information from the front to the army commander. By establishing messenger services and relays as backups for radio communications the AIS was able to continue functioning even when other elements could not communicate. Third Army also recognized that retreating German forces faced the same communications difficulties when moving from prepared positions and wire communications. The Germans had to rely on less-secure radio communications, which opened new opportunities for Third Army to exploit German information. Therefore, Third Army employed aggressive offense in the physical domain, gaining access to enemy communications that would otherwise be inaccessible given the limitations of available intelligence collection technology. Third Army also updated its methods to take advantage of sophisticated Allied decryption capabilities. Whereas Patton's had a limited appreciation for Ultra before the Mortain offensive, he made extensive use of the Allied technological advantage following Ultra successes in early August. By the end of August, Third Army was better organized and conceptually oriented to exploit and offset the limitations of available information technology.

Throughout August, Third Army capitalized on the flexible and mobile organizational structures created during the preceding months. Lucky Forward, the AIS, and the SIS were continuously on the move during the race across France, and organizationally Third Army's information forces represented the definition of flexibility. After only one week in combat, Patton restructured Third Army's approach to Ultra. In addition to displaying intellectual flexibility by quickly grasping new concepts and their potential, Patton and his staff were organizationally flexible, integrating this intelligence source in new and innovative ways.

After less than two weeks of combat, the Third Army analyzed combat performance and adjusted its experimental AIS construct, breaking with the established SIAM mission of radio monitoring to focus exclusively on directed liaison. In combat, the AIS also radically reorganized the composition of its detachments at the corps and division levels, added new detachments, reformed radio procedures, established radio and messenger relay stations, and altered the construct of its headquarters. Similarly, during the same two weeks, the G-2 section assumed responsibility for the Psychological Warfare branch and, within three weeks, the SIS took responsibility for the Army Message Control Center. These examples illustrate Third Army staff's flexibility and the creative ways they integrated like functions and increased efficiency. Third Army information forces became progressively more militarily effective over the month and contributed significantly to battlefield success during August's high-tempo operations.

The rapidity of these changes and resulting improved effectiveness were only possible because of the organizational urgency within Third Army, its robust feedback loops, and the work of diverse experts across the formation. Patton's information advantage vision and his consistent desire for increased efficiency permeated Third Army. He believed that at the beginning of operations, not the end, "a group composed from the G-2 and G-3 should start the compilation of the After-Action Report."⁷⁶ Hav-

ing established an open-minded and performance-oriented culture within Third Army in the preceding months, from the beginning of operations in France, Patton emphasized learning and continual improvement. He also overcame organizational resistance against some of the changes made in England. For instance, by early September, 6th Cavalry Group members were committed to improving on and developing the AIS concept. The bottom-up refinement of the AIS concept strongly indicates that the members felt urgency to change and understood the importance of the AIS's role. The 6th Cavalry Group would fight as a cavalry formation during the Battle of the Bulge. Still, almost all articles published by 6th Cavalry Group members after V-E Day focused on their time as part of the AIS in August and September.

The rapidity with which Third Army adapted was only possible because of its robust feedback loops. The AIS, in particular, used well-developed performance and effectiveness measures. In judging performance, the feedback loops measured how fast information moved from the front line to G-2 and G-3 operations rooms. They considered the accuracy of information passed from various echelons to headquarters as well as examining the amount of information being transmitted and how much could not be transmitted due to lack of communications between the information detachments and AIS headquarters. In measuring the efficiency of its operations, the AIS examined to what degree information was driving decision-making and whether it was gathering the right type of information. Was the AIS feeding up and processing the correct information in time for it to be useful? Third Army's urgent drive for efficiency propelled the AIS to seek improvement constantly. Patton was not one to change simply for change's sake; he believed new commanders or commanders in new environments should "wait at least a week before they make any radical changes."77 Yet by employing well-crafted evaluation metrics, the AIS was able to analyze performance gaps quickly and accurately. Expertise within the organization encouraged the development of feasible courses of action to correct any gaps. Specifically, according to the Third Army G-3 August After Action Report: "In organizing additional detachments, certain experiences of detachments already operating were taken into consideration."78 Together, these factors enabled the AIS to adjust quickly and confidently while in combat to increase effectiveness, not simply react to performance shortfalls.

Third Army required diverse expertise to judge performance feedback, analyze potential solutions, and generate militarily effective changes. The example of Major Helfers illustrates how an expert outsider's perspective helped facilitate change in operational concepts. As a career infantryman filling a special intelligence role in an organization led by cavalrymen, Helfers was ideally situated to challenge Third Army's perception of Ultra and ultimately help upend how Third Army utilized it at the operational level.

Third Army's diverse expertise also supported adaptation of the AIS. Writing after the war, one AIS member described the level of competence of the AIS personnel: "Important and far-reaching decisions were made on what Sgt. Richard Roe or Private John Doe saw or heard and reported."⁷⁹ While expertise was helpful with day-to-day AIS operations, individual competence was even more important for adaptation. Third Army's willingness to accept bottom-up feedback from Fickett's expertly trained radio-operating enlisted cavalrymen enabled dynamic changes in the AIS and higher military effectiveness within Third Army information forces.

Throughout August, Third Army became progressively more effective at generating information advantage, enabling dramatic operational-level success. Instead of just breaking through in Normandy, Third Army broke out, disintegrating German defenses and consistently outpacing German attempts to establish new lines. Only logistical shortfalls, deteriorating weather conditions, and disagreements within Allied forces prevented full exploitation, the destruction of the German 7th Army, and a push to the German border. Throughout, Third Army's information advantage approach helped with anticipating decisions, retaining the initiative, managing risk, and extending its operational reach. This level of success can be ascribed to the unique military culture of Third Army, particularly its urgent approach to increase efficiency, well-established feedback loops, and diverse expertise.

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Chapter 6 Conclusions

New ideas are what are winning this war. —Lt. Gen. George S. Patton Jr., *The Patton Papers*

Third Army succeeded in the breakout and pursuit across France because Patton successfully embedded a military culture that encouraged adaptation. Patton created a vision for information advantage and a sense of urgency within Third Army that compelled members on an emotional and intellectual level to seek improvement. Patton and his coalition set the tone within Third Army by creating robust formal and informal feedback loops and encouraging experimentation, self-criticism, and rigorous performance analysis. He also embraced diverse expertise, surrounding himself with diverse voices and promoting creative thought through constructive disagreement. This unique culture enabled Third Army to find new ways to integrate its capabilities and supporting functions as part of information forces-helping keep concepts in line with available technology and ensuring that Third Army information forces remained mobile and flexible. Third Army's military culture drove the process of adaptation, resulting in progressively higher military effectiveness and operational-level information advantage in France, which allowed Third Army to gain and maintain the initiative, anticipate decisions, and extend its operational reach.

The historical case of Third Army demonstrates the criticality of urgency, feedback loops, and diverse expertise to driving adaptation in information forces. The adaptation model remains applicable to information forces-even those that do not have direct physical contact with the enemy-assuming they possess the cultural attributes necessary to mitigate the attenuation of feedback. Urgency, defined as a vision for change combined with a perceived need for change, encourages information forces to overcome this attenuation by continually working to improve performance and align with a shared future vision. Feedback loops, defined as an organizational emphasis on experimentation, self-criticism, intellectual honesty, well-crafted performance data collection measures, and rigorous analysis, also allow information forces to overcome performance assessment challenges. Finally, diverse expertise, defined as an organizational emphasis on welcoming divergent backgrounds and perspectives, mitigates stagnation and promotes creative solutions to complex problems. Together these aspects of military culture are critical for increasing military effectiveness in information forces.

Military culture, therefore, largely determines an organization's ability to adapt to changed or changing circumstances in combat. Historians Peter Mansoor and Williamson Murray noted: "Explanations for the success or failures of militaries in both war and peace have traditionally focused on key factors such as technology, leadership, personnel, training, or a combination of all of these."¹ Yet, these factors on their own do not completely explain military effectiveness or how organizations overcome a reluctance to adapt. This is not to say that technological advantage is irrelevant or that quantitative advantages do not have a quality all their own. Similarly, it is impossible to divorce military effectiveness from non-material factors such as training and leadership that dictate how proficiently military organizations employ their material resources. Instead, the 1944 Third Army case suggests that military culture determines how well organizations respond to change.

Given the pace of technological change in the twenty-first century, an adaptive military culture is even more relevant to maintain military effectiveness. Trends suggest that technological innovation will continue to accelerate over the first half of the twenty-first century, and previously disparate human and materiel systems will converge with one another.² Rapid technology changes and the convergence of existing technologies will create new and, in some cases, unforeseen challenges for military forces. These trends will continually test the ability of information forces to generate information advantage. Military technologies and organization and employment concepts may become obsolete more quickly than in the past. Simultaneously, it may become progressively more critical for information forces to create a window of superiority against an enemy.3 Yet, as Mansoor and Murray noted: "Technology-centric forces must take care not to allow a culture focused on technological excellence to turn into one centered on technological determinism."⁴ Emphasis on the technical over the cultural promises to paradoxically leave organizations less capable of effectively leveraging emerging technology. Military culture in information forces will determine how quickly they adapt to technological progress and operational environment changes produced by convergence. Military culture will also inform how effectively information forces respond to adversary adaptations. Third Army's experience in 1944 suggests that information forces in the twenty-first century must possess a culture that emphasizes the pressing need for continual change and is self-critical, risk-tolerant, and willing to experiment. This culture must cultivate divergent and creative thinking by embracing and promoting diversity.

Urgency

Patton succeeded in driving adaptation within Third Army and generating information advantage by creating a sense of urgency. He articulated a vision for change, promulgating a vision for operational-level information advantage and building a coalition dedicated to operationalizing his vision. By articulating a vision for change, commanders like Patton promote the need for change and describe the necessary elements to make it happen. Creating urgency within information forces also requires a clear vision for how information advantage relates to overarching operational concepts. Finally, the commander needs a coalition dedicated to operationalizing the vision. Patton succeeded in visualizing and building a coalition and consequently created a strong sense of urgency within Third Army, thereby driving adaptation.

A Vision for Change

Patton's vision for change centered on creating a culture that encouraged flexibility and aggressively pursued efficiency. He aligned himself with change: "New ideas are what are winning this war."⁵ Yet Patton's vision for change was not simply a vision of technological superiority. While certainly open to new technology's promise, Patton focused on human factors and military culture. By articulating this vision, Patton also became a credible proponent for change.

Third Army's combat performance in 1944 suggests visions for change that focus on culture are critical to adaptation. Yet, Australian military thinker Michael Evans observes a dangerous tendency within modern Western military institutions to "view war through the narrow materialist lens of science and high-technology."⁶ While technological change alters the dynamics of combat, cultural factors play substantially affect how military organizations assimilate and employ technology. These cultural factor effects are rarely straightforward. Army Doctrine Publication (ADP 6-22), *Army Leadership and the Profession,* suggests that strategic leaders must understand "complex cause-and-effect relationships and anticipate effects of their decisions throughout the organization."⁷ Consequently, leaders cannot simply have a vision of technological progress. Patton's success in France suggests that operational-level leaders must develop and promulgate a vision for positive change that puts culture at the center.

A Vision for Operational Level Information Advantage

Patton also promulgated a vision for operational-level information advantage that complimented his approach to warfare. Patton's operation-

al technique synthesized US Army doctrine from the 1940s with his philosophy that "speed was essential not only in the execution of a plan but also in its conception."⁸ Patton's approach emphasized mobility and continuous offensive action to attack the enemy at its weakest point. Patton visualized and articulated to Third Army how information advantage would allow him to outpace the enemy, enabling mobility and continuous action.

Patton understood that it was impossible to possess perfect situational awareness or security. This belief reflected US Army doctrine at the time:

In campaign, exact conclusions concerning the enemy can seldom be drawn. To delay action in an emergency because of insufficient information shows a lack of energetic leadership and may result in lost opportunities.⁹

Patton took this conclusion one step further, visualizing information advantage as a time-based competition for a fleeting relative advantage. Patton's methodology was decidedly opportunistic. His goal was to take action before the enemy could react. This progressively made what the enemy saw and responded to less relevant to the actual situation. Patton could create further separation between himself and his enemy by attacking enemy decision-making processes, creating friction and delays. If Patton maintained the initiative, he would keep the enemy off balance and "rocking." If he acted faster and his decisions were more relevant to the current situation, he would maintain the initiative and exploit opportunities.

Patton's information advantage vision reflected an understanding that information advantage is not a competition for objectively superior understanding but one to understand, decide, and act more quickly. Under ideal conditions, a commander's decisions should be informed by perfect understanding. However, Army Doctrine Publication (ADP) 6-0, Mission Command: Command and Control of Army Forces indicates: "Commanders realize that uncertainty and time preclude achieving perfect understanding before deciding and acting."10 Patton did not need perfect situational awareness, perfect understanding of the operational environment, or perfect security for friendly information. Nor was it necessary for Third Army to be overwhelmingly successful in attacking enemy information, decision-making processes, or cognition. Patton believed Third Army needed superior speed in understanding, deciding, and acting. The unit's experience suggests that an information advantage vision should emphasize speed and the time-based competition dynamic over objective measures of complete understanding or control.
Building a Coalition

To operationalize his vision, Patton created a coalition dedicated to change. Given that military organizations have a natural tendency toward inertia, organizations must encourage active participation in the improvement project. Patton clearly understood this and created a culture that solicited subordinate leader commitment. At first, Patton's coalition consisted of senior staff brought over from Seventh Army, like Brig. Gen. Hobart Gay, Col. Oscar Koch, and others. The distinctive Lucky culture that Patton built encouraged others like Col. Edward M. "Joe" Fickett, Lt. Col. Melvin Helfers, and Maj. Charles W. Flint to become proponents of change. Through these trusted agents, Patton overcame resistance to new concepts and convinced rank-and-file members to actively promote new ideas.

Feedback Loops

Third Army succeeded in generating operational-level information advantage because it built a culture that encouraged experimentation, self-critical and open analysis of past experiences, and confident application of new solutions. Because he understood the dynamics of war are constantly changing, Patton encouraged problem-solving and active experimentation. Recognizing the difficulty of establishing clear cause-effect relationships in war, he encouraged Third Army to be open, self-critical, and deliberate in designing performance and effectiveness metrics. Finally, armed with accurate analysis built on a solid understanding of the operational environment, Third Army encouraged bold implementation of new solutions.

Patton understood that the operational environment is constantly in flux as military forces adapt to one another and the environment. Ever the student of history, Patton was undoubtedly familiar with Clausewitz's observation that commanders are challenged by "continual change [in war] and the need to respond to it."¹¹ US Army doctrine from the 1940s echoed this sentiment: "The situations that confront a commander in war are of infinite variety," and "changed conditions may call for a new decision at any time."¹² Moreover, Patton recognized that the conduct of war is suspended between human drives, and human participation changes not only the particulars of the war but the dynamics of combat itself as humans alter their methods to gain an advantage. Therefore, as ADP 6-0 asserts, war is "not a mechanical process that can be precisely controlled by machines, calculations, or processes."¹³ Instead, organizations must continuously and honestly evaluate the environment as it changes and encourage experimentation and flexibility.

Encourage Experimentation

Third Army encouraged experimentation both while preparing to deploy in England and during the pursuit across France, because Patton recognized the problem was complex. The enemy was also changing and adjusting its methods to fight US forces in northern Europe. Therefore, simply gathering data about the situation was insufficient. Instead, Patton intuitively recognized the need to experiment within and probe the system.¹⁴ Thus he worked to create a culture that was willing to take certain risks and open to experimentation even in combat. Understanding that failure often accompanies learning, Patton tolerated failures that resulted in organizational learning and growth. He also was willing to take risks, deploying the untested experimental AIS construct directly into combat in August. Third Army's willingness to aggressively experiment, and potentially suffer setbacks, allowed it to identify ways to increase military effectiveness and generate information advantage.

Clearly Define Measures of Effectiveness and Performance

The pursuit of efficiency drove Patton to create a culture within Third Army that carefully examined performance. Human interaction places the operational environment in a constant state of flux. Army Doctrine Publication (ADP) 3-0, *Operations*, notes that this dynamic makes "determining the relationship between cause and effect difficult and contributes to the friction and uncertainty inherent in military operations."¹⁵ Third Army recognized the difficulty in establishing causality between information advantage activities and particular outcomes. To support this culture, Third Army's information forces, particularly the AIS, developed well-designed performance and effectiveness measures. Patton also stressed the importance of conducting reviews continuously, as opposed to at the end of operations.

Consequently, The AIS created and continually refined its measures of evaluation. These measures went beyond the easily or superficially quantifiable, instead examining how well the AIS was enabling decision-making. Throughout the August pursuit, the AIS consistently measured how much information they were moving and whether that information contributed to enhanced decision-making. During this self-critical examination, they questioned the value of and ultimately abandoned the traditionally central SIAM function of radio-monitoring.

Adaptable organizations like Third Army possess a culture devoted to accomplishing core mission sets and are not beholden to particular forms

or functions. A culture that emphasizes openness and self-criticism allows organizations to objectively and systematically analyze performance data. It also encourages continuous review of performance and effectiveness measures to ensure they remain relevant and are capturing useful performance feedback. Finally, such a culture enables organizations to confront organizational shortfalls and examine core organizational functions honestly. Ultimately, it allows organizations to determine whether previously established methods remain applicable to changed conditions.

Aggressively Implement Changes

Third Army succeeded in operationalizing its new concepts because it aggressively implemented changes. The AIS cut its monitoring mission, restructured its communications pathways, and reorganized its information detachments across multiple echelons within two weeks of beginning combat operations. The Signal Intelligence Service (SIS) assumed responsibility for the entire Third Army Message Control Center within three weeks. Third Army did not make these decisions blindly or prematurely; they were based on a clear evaluation of combat performance derived from experimentation and robust data collection. These and other decisions incorporated the advice and careful consideration of diverse experts. Confident in its analysis, Third Army wasted no time in adjusting. This flexibility made Third Army's information forces more suitable for the environmental conditions and enabled them to generate information advantage consistently.

Diverse Expertise

Third Army successfully encouraged positive adaptation because Patton built a culture that welcomed individuals with diverse backgrounds, promoted an interdisciplinary approach to problem-solving, and incorporated the perspectives of non-"career-army" soldiers. Third Army's experience suggests that information forces are most successful when they actively promote diverse perspectives. Incorporating diverse expertise fosters creative friction that helps organizations develop innovative solutions to complex problem sets.

Diversity and Inclusion

For its time, Patton's Third Army was a diverse organization, and its information forces included a substantial number of new immigrants to the United States. These newcomers not only brought useful cultural and language competencies but different perspectives. The inclusion of these men and their diverse perspectives facilitated creative problem-solving. In keeping with Army practices, Third Army did not incorporate women, people of color, or other minority groups. Yet, the Third Army experience in 1944 suggests that successful information forces promote diversity and inclusion. Research strongly suggests that cultural, gender, and geographic diversity are strongly correlated with innovation.¹⁶ In their 2016 Harvard Business Review article, authors David Rock, Heidi Grant, and Jacqui Grey commented that "diversity-both inherent (e.g., race, gender) and acquired (experience, cultural background)-is associated with business success."¹⁷ To derive the maximum benefits from diverse backgrounds, organizations must embrace and see the value of diverse viewpoints. The authors further commented that if leaders recognize "debate and unfamiliarity that come with diversity is an important catalyst for creativity and deep thinking, they will invite it and celebrate it. And very likely, the organization and everyone in it will reap the rewards."¹⁸ To encourage creativity, future information forces must place a premium on recruiting talented members across the spectrum of gender, racial, ethnic, and cultural backgrounds. They must also ensure that the organization's culture promotes diverse viewpoints and the accompanying creative friction.

Interdisciplinary Approach

Patton's Third Army approached problem-solving from an interdisciplinary perspective. In developing his information advantage approach, Patton encouraged the wide-ranging participation of experts from various professional backgrounds. For example, Flint, who led the SIS expansion and collaborated in the AIS development, was a former enlisted signal soldier. His collaborators in adapting the 6th Cavalry Group into an information service were Fickett and Stewart, career Cavalry officers. They brought very different competencies and perspectives to the problem and together generated an unorthodox but remarkably successful solution.

Similarly, Helfers, the Third Army Ultra representative, was an Infantry officer-turned-intelligence-professional assigned to a staff led primarily by current or former cavalrymen. His outside perspective challenged norms and encouraged creative thought within Third Army. Finally, and most importantly, Patton created his Third Army staff from pieces of his old Seventh Army staff and the original Third Army staff. One staff had experience in large-scale combat operations in the Mediterranean. The other excelled at managing large organizations over wide areas. They brought different perspectives and competencies to the question of how to generate information advantage—very different staffs that proved more successful together than they would have been separate. Third Army's experience suggests that information forces must employ an interdisciplinary approach to problem-solving and develop organizational processes and a culture that incorporates experts with varying backgrounds. This includes incorporating individuals from outside the traditional science, technology, and mathematics fields. Third Army's experience also suggests the value of incorporating military personnel from branches not traditionally associated with intelligence or information. The example of Helfers shows that service members "will need to be able to maneuver effectively between communities while still maintaining upward mobility."¹⁹ The creation of such career paths will encourage an interdisciplinary approach within information forces.

Non-Career Army Perspectives

Third Army drew on the experience of career Army as well as "civilian" officers. The vast majority of Third Army, even its army-level staff, consisted of non-career soldiers. These soldiers brought perspectives gained from their civilian employment. They also were relatively unbound by traditional Army orthodoxy. What they lacked in experience, they made up for in dedication to the national project of victory over fascism. Third Army excelled at bringing out the best in its civilian soldiers by integrating them with professional soldiers. Primarily civilian signal soldiers advised and trained the professional 6th Cavalry as it transitioned to an information role. The 118th Radio Intercept Company owed its ingenuity as much to DeVry Technical School as it did to Army Signal Corps training. Together nonprofessional and career soldiers complimented one another and delivered information advantage for Third Army.

Third Army's experience suggests the value of incorporating those with expertise outside the Army to promote creative approaches to information advantage. Creating systems that encourage interaction between short-term soldiers and careerists—and equally value the input of both—can spur adaptation. Exploring ways to design multi-component formations could have a similar effect. To generate information advantage in the future, organizations will need the diverse expertise of professional soldiers, reservists, and the civilian workforce. Creating a culture that welcomes the input of all and promotes synergy between them is critical to encouraging adaptation.

Enduring Implications

Third Army's performance suggests that successful military forces leverage the human element and carefully weigh span of control con-

siderations in conducting information advantage activities. Information technology improvements open new possibilities to generate information advantage, but the placement of humans at important positions is often critical. Integrating functions within organizations requires similarly thoughtful consideration of the span of control. As technology, the environment, and missions change, the way these considerations apply also changes. Opportunities to leverage the human factor and balance span of control changed throughout the campaign in northern Europe. Encouraging flexibility allows organizations to determine how best to leverage the human element and maintain the balance needed to integrate capabilities without becoming unwieldy or unable to function in combat.

The Human Element

While the direct applicability of an information service modeled on Third Army's AIS is limited, there are some enduring lessons about the importance of the human element in generating information advantage. After World War II, the US Army abandoned the information service concept, primarily due to improvements in command and control systems. Yet even in the early Cold War, some officers examined the implication of trends such as enhanced mobility of ground forces, greater dispersion of units, and the effects of new weapons. They concluded that these trends could make an information service necessary once more.²⁰ The AIS adapted to become an active information hunter in France. Understanding Patton's information requirements and possessing a streamlined method to acquire and relay information, the AIS always kept the Army commander up to date with relevant and timely information for decision-making. It also ensured that adjacent units had a shared situational understanding, permitting decentralized execution of a common approach. In communications-degraded, intermittently connected, or low-bandwidth environments, commanders will struggle to acquire information that allows them to make informed decisions rapidly. Similarly, actual or potential information system compromise can cause commanders to lose confidence in their information or the integrity of their decision-making processes at critical moments in combat. Like Patton's AIS in 1944, the human element can mitigate some of this difficulty and enhance commander decision-making capabilities.

Span of Control in Coordinating Information Advantage Activities

Third Army experimented with organizing information forces and staff elements to ensure speedy and efficient information advantage activities. Additionally, it consolidated like functions within organizations as much as possible to ensure close coordination and rapid decisions appreciating the risk of overextension in organizations with broad spans of control.

The SIS gradually expanded from March to August 1944 as Third Army aligned additional responsibilities under it. In March, the SIS primarily concentrated on its core functions of exploiting enemy communications and ensuring communications security through radio monitoring and the provision of codes, ciphers, and cryptologic equipment. As early as May, though, its role expanded to include military deception in the electromagnetic spectrum and emissions control. The SIS also took on an expanded information assurance mission, assuming responsibility for additional counterintelligence and physical security functions, and later added responsibility for attacking enemy information systems when it began managing exploiting captured enemy cryptologic materials. In August, Third Army placed the Army Message Control Center and all army messenger services under SIS control; effectively, the SIS had overall responsibility for assuring Third Army decision-making systems and processes. The SIS monitored the friendly communications network to keep it secure from compromise. Simultaneously, it leveraged situational awareness of the state of the network, and responsibility for maintaining portions of the network, to ensure speedy transmission of priority messages. The synergy between the SIS's security and network management functions enhanced Third Army decision-making.

Similarly, SIS efforts to enable decision-making and protect friendly information complemented its efforts to attack enemy decision-making. The SIS was centrally positioned to balance emissions control requirements and electromagnetic deception with the need to ensure that information was flowing within Third Army. The SIS advised Third Army on how to create a misleading picture of its disposition through radio countermeasures while simultaneously ensuring situational understanding, the transmission of priority messages, and speedy and assured decision-making and execution. In these new roles, SIS was responsible for deconflicting electromagnetic deception, electronic attack, and friendly spectrum use. Third Army progressively aligned like functions to increase the speed and efficiency of decision-making and the speed of execution. By creating an organization to manage many like functions, Third Army increased reliability and efficiency and generated information advantage.

As span of control increases, organizations tend to become unwieldy and lose mobility. Consequently, organizations must balance the benefits of integration and centralized control with the necessity of dividing responsibilities across organizations and echelons to ensure efficiency and flexibility. For example, even though the SIS continued to expand, it remained subordinate to the Signal section. Despite a high degree of cooperation with the G-2, Third Army did not combine all its various functions under one organization.²¹ Consequently, the Psychological Warfare branch never came under SIS control, even though they did coordinate closely. Similarly, while the AIS and SIS performed complementary functions, were often collocated, and cooperated extensively, the AIS remained under the control of the G-3 and had no formal relationship with the SIS.

In addition to dividing responsibilities among organizations, Third Army divided responsibility by echelon, experimenting with different functions at different echelons; however, it typically retained limited-resource support and security functions at the army level. For example, the SIS managed the significant logistic burden of obtaining and distributing cryptologic materials on behalf of the corps and was responsible for communications-related physical security and counterintelligence. It also delegated responsibility for exploiting captured enemy cryptologic materials to the RI Company. Exquisite capabilities that required extensive coordination, such as radio countermeasures, also remained army-level responsibilities. Yet, Third Army federated responsibility for security monitoring and collection and analysis across the corps and army. There is no indication that SIS or Third Army, centrally controlled or coordinated military deception efforts. Tactical deception fell under the purview of divisions and corps. Third Army recognized that managing certain functions would outstrip a tactical corps' capabilities and attempting to control certain functions at the army level would decrease efficiency and flexibility. The number of changes in how the Third Army organized its information forces and approached information advantage activities suggests that it successfully balanced these requirements by being open to experimentation and adaptation.

Conclusion

Between March when it stood up and August when it reached eastern France, Third Army dramatically altered how it fought. In just over 100 days, Third Army designed, fielded, deployed, and redesigned an AIS to enable decision-making. Over thirty-one days in combat, it realigned capabilities to protect friendly information and attack enemy decision-making. These rapid changes and the resultant increase in military effectiveness were only possible because of the culture that Patton formed in just 163 days in mid-1944. Patton developed a Third Army culture that encouraged urgency, robust feedback loops, and diverse expertise. He created a vision for information advantage that inspired urgency and encouraged members of Third Army to innovate. Additionally, Patton promulgated a vision for information advantage as a time-based competition. His emphasis on robust feedback mechanisms and diverse expertise encouraged self-criticism and creative thought within Third Army. This allowed individuals like Fickett and Flint to develop new methods that improved the military effectiveness of Third Army information forces. Together, Patton's coalition aligned capabilities and support functions to enhance decision-making, protect friendly information, and deny the enemy the use of information. They ensured concepts were consistent with available technology while simultaneously maintaining flexibility and mobility. Overall, this culture enabled Third Army to adapt, generate information advantage, and achieve operational success.

Third Army's experience shows military culture is the primary driver of military effectiveness. Culture determines whether military organizations can successfully leverage available technology. It also determines how well organizations weather change. Given that the operational environment is constantly in flux and technological progress is constant, a military organization's success in generating information advantage is determined mainly by its culture. Patton's Third Army demonstrated that organizations which encourage urgency, establish robust feedback loops, and embrace diverse expertise are more likely to generate operational-level information advantage, gain the initiative, anticipate decisions, and extend operational reach.

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Appendix A Information Advantage and Combined Arms Warfare

You musicians of Mars . . . must come into the concert at the proper place and at the proper time.

-Lt. Gen. George S. Patton Jr., The Patton Papers

Though US Army doctrine has evolved dramatically since 1944, Patton's methodology and Third Army's campaign in France continue to influence US Army thinking. Patton's influence in the US Army continued even after his death, with many of his Third Army subordinates like General Creighton Abrams going on to hold senior positions in the US Army during the 1950s and '60s. In addition, many of his subordinates, including Col. (later Brig. Gen.) Oscar Koch, published memoirs that explained Patton's warfighting approach. Consequently, Patton's thinking certainly impacted the maturation of US Army concepts related to the operational art and combined arms warfare in the decades after World War II. Furthermore, his approach to information and method for getting inside an enemy's decision-making cycle foreshadowed the development of information operations concepts. Thus, Patton not only influenced current warfighting concepts but has relevance for the future development of information advantage concepts.

This appendix explores twenty-first-century concepts related to information advantage and the operational art. It defines information advantage and explores operational-level information advantage in conflict then describes information advantage activities and how they provide an intent-based approach to generating information advantage. This appendix concludes with a brief description of effective information forces and their contributions to combined arms warfare. While this summary focuses on present-day information advantage warfighting concepts, it draws on the example of Third Army in 1944.

Defining Information Advantage

While the information advantage concept encompasses multiple other concepts, possessing information advantage enables a commander to open and rapidly exploit windows of superiority. Specifically, US Army Cyber Command defines information advantage as "a condition when a force holds the initiative in terms of relevant actor behavior, situational understanding, and decision-making."¹ Information advantage contributes to a commander's ability to understand his environment, make an accurate and timely decision, and then execute that decision with assurance. Generating information advantage is a competitive activity because possessing information advantage allows one side to disadvantage the other. In military decision-making, time is often the limiting factor. Consequently, while some information-related advantages can be persistent, information advantage typically is fleeting, representing a window of opportunity that must be exploited to have a lasting effect. Thus, information advantage can be conceptualized in terms of a time-based competition. Still, actions to generate information advantage depend on the situation because information advantage is related to the types of advantage sought, the relevant actors, and the operational environment.

To better understand the nuance of information advantage, social scientist Christopher Paul lays out a framework that explores the military definitions of information and advantage. He defines information as "the content and data that individuals, groups, and information systems communicate and exchange, as well as the human and technical processes used to exchange information."² Still, beyond this simple definition, information in a military context has multiple meanings. According to Paul, it can represent situational awareness or a general understanding of friendly elements, adversary elements, and the operating environment—as well as the ability to command and control forces—and encompasses factors such as electronic warfare that can degrade command and control and situational awareness.³

Paul's definition of information also includes aspects of the operational environment that can "cause subordinates to behave in ways contrary to a commander's preferences."⁴ This contrary behavior can be due to misunderstanding between the commander and subordinates resulting from a breakdown in common situational awareness. It can also be due to different perceptions of the environment stemming from divergent personalities of the commander and subordinate. This phenomenon is directly related to the concept of "information for effect" or "efforts to affect behavior." By providing the enemy with information, an army can influence its enemy to behave in a desired way. Theoretically, an army that understands differences between enemy commanders and their subordinates can provide information that would lead the subordinate to act contrary to the desires of the superior. Finally, information can represent efforts to affect behaviors more broadly, influencing not just an adversary but the behaviors of relevant actors across the operational environment.⁵

The term advantage also has multiple meanings. First, Paul notes that advantage, implying superiority of some kind, is a means to some end

rather than an end in and of itself; it can only be conceptualized in relation to the desired effects.⁶ Second, advantages can be persistent or fleeting—a persistent advantage in capability or capacity and a fleeting advantage in time, position, or surprise.⁷ Finally, advantages can be unknown or known. If an advantage is unknown to the enemy, one must actually deploy the advantage to gain a benefit from it. Conversely, if an advantage is known to the enemy, one can simply display the advantage or threaten to deploy it in order to gain a benefit from it.⁸

Information advantage is situational and relative to different requirements at different levels of war. Consequently, activities to generate information advantage differ at different levels of war and across the conflict continuum. For instance, in competition, adversaries attempt to exploit political vulnerabilities within the US and its allies—creating friction and eroding resolve.⁹ The adversary then exploits this lack of cohesion to achieve operational objectives. To prevent this, the joint force influences foreign audiences and informs domestic audiences while denying the enemy the use of information. This preserves cohesion and deters the enemy by denying the starting conditions necessary to commence hostilities with a reasonable certainty of success. Clearly, this is quite different from the approaches that would need to be taken in conflict.

In all contexts, though, generating information advantage is an inherently competitive activity, because information advantage enables one side to act in beneficial ways at the other's expense. Generating information advantage is not a competition for objectively perfect understanding or complete control. Instead, it is a competition to sense, understand, decide, and act relatively more quickly than the adversary in ways that better reflect the reality of the operational environment. The UK Ministry of Defense notes that forces gain information advantage only through "continuous, adaptive, decisive, and resilient employment."¹⁰ Thus, simply possessing an advantage does not necessarily translate into a change in the operational environment. Instead, generating information advantage is a continuous process to achieve relative superiority and facilitate action.

Operational-Level Information Advantage in Conflict

Given that information advantage is relative to the desired ends, information advantage at the operational level differs from information advantage at the tactical or strategic level. Information advantage in combat also differs from information advantage in competition. At the operational level in conflict, information advantage enables commanders to gain and maintain the initiative, extend operational reach, and anticipate decisions while balancing risk. At the beginning of an operation, information advantage enables a joint force to create false perceptions, causing the adversary to place his forces in a position of relative disadvantage.¹¹ Information advantage then enables the joint force to penetrate the enemy's long-range systems by degrading elements of enemy combat power such as command and control or intelligence.¹² Information advantage also allows the commander to maintain the initiative and expand the penetration by disrupting the enemy's effective employment of maneuver formations before it can interdict friendly forces.¹³

After penetrating the enemy standoff, information advantage extends a joint force's operational reach, the distance and duration across which the force can successfully employ military capabilities.¹⁴ Enemy capabilities, geography, or other environmental conditions constrain operational reach. Information advantage can mitigate the tyranny of distance, extend the effects of friendly action in both time and space, and defeat enemy attempts to desynchronize friendly action. Information advantage allows a commander to apply power against enemy sources of strength simultaneously and in depth, disintegrating enemy combat power.

Information advantage also allows operational-level commanders to anticipate decisions, continuously "forcing the enemy or adversary to react rather than initiate."¹⁵ The cumulative effect of continuous anticipation and denial of information to the enemy is that the enemy lags behind in reacting to events. As a result, enemy decisions become progressively less militarily effective from engagement to engagement. This enables the commander to exploit the penetration and disintegration of enemy systems and achieve operational and strategic objectives.¹⁶

Across all phases of a campaign, information advantage enables the commander to link actions more efficiently in time and space while balancing risk. Information advantage allows a joint force to gain the initiative, extend operational reach, and continuously anticipate decisions. Relatively superior understanding and enhanced decision-making capabilities enable a joint force to sense, understand, decide, and act faster and with greater assurance than its enemy.

Information Advantage Activities: An Intent-Based Approach

All military activities produce information and impact the human and information dimensions, but commanders rely primarily on information-related capabilities to generate information advantage.¹⁷ Information-related capabilities are "tools, techniques, or activities employed within a dimension of the information environment that can be used to create effects and operationally desirable conditions."¹⁸ These capabilities include cyberspace operations, electronic warfare, military deception, operations security, information operations, and public affairs. To successfully generate information advantage, an army needs a conceptual framework for employing these capabilities that links them to capabilities like lethal fires or maneuver that are not traditionally conceptualized as information-related capabilities.

Information advantage activities represent such a framework; United States Cyber Command defines them as the "employment of capabilities to support decision-making, protect friendly information, and affect relevant actor perceptions, attitudes, and behaviors to gain and maintain information advantage."¹⁹ Cyber Command identifies five broad information advantage activities:

- Enable decision-making—Enhance understanding of human and information dimensions; assure systems and processes for decision-making.
- Protect friendly information—Identify, secure, obscure, and defend friendly information and information systems from compromise or attack.
- Inform and educate domestic audiences—Provide timely factual information about US Joint, Army, and Combined operations to domestic audiences.
- Inform and influence foreign audiences—Assure allied partner and neutral audiences and influence non-domestic perceptions and behaviors.
- Deny use of information—Attack adversary elements of combat power and defend friendly use of information against adversary information attack capabilities.²⁰

Information advantage activities do not simply employ a capability at a discrete place or time to have a single effect. Instead, they are ongoing processes that integrate multiple capabilities to generate a marked operational advantage over the enemy. Approaching information advantage from an activities or intent-based perspective rather than a capabilities perspective emphasizes the importance of integrated efforts to achieve effects rather than applying specific means. This approach recognizes the need to organize these capabilities so they create mutually supporting effects that offset weakness and take full advantage of opportunities. It also underscores the importance of synchronizing employment of available military resources, not just applying individual capabilities at discrete places and times.

Information Forces

Given that generating operational-level information advantage in conflict is a time-based competitive activity, a joint force requires organizations that can integrate capabilities and synchronize their employment. Information forces integrate and synchronize these capabilities most efficiently and sustain a joint force's capacity to generate information advantage across the entirety of a campaign. They consist of information advantage activity planners and integrators; elements that participate in information advantage activities as part of their core mission; and portions of the intelligence apparatus dedicated to supporting information advantage activities.²¹

Information forces combine multiple capabilities that make it easier to engage as a whole and produce a desired effect. By fighting as a cohesive whole, information forces can converge cyber, military deception operations, and other capabilities to make the transient effects of capabilities like electronic attack more permanent.²² Information forces are also best postured to integrate into combined arms formations, converging their capabilities with maneuver and firepower to force multiple dilemmas on the enemy. The planning and integrating expertise within information forces also enables formations to synchronize disparate capabilities and reliably generate information advantage throughout a campaign. An information force's ability to fight as a cohesive whole also makes it substantially easier to synchronize efforts as part of a combined arms approach.

Additionally, information forces integrate specialized and robust support functions that sustain their ability to maintain contact with the enemy across its operational depth and overwhelm the enemy's decision-making cycle while protecting friendly information. Over the course of even a brief campaign, the enemy will attempt to change its methods and address performance shortfalls. Therefore, capabilities used at the beginning of a conflict will likely be less effective or perhaps even ineffective at the end of a conflict. An effective information force possesses dedicated and responsive support structures; these structures, in turn, enable the information force to regenerate its capabilities and sustain efforts against an adaptive enemy.

Much like the fires community, militarily effective information forces are maximally interoperable with joint, interagency, and multinational partners.²³ Information forces at the operational level work closely with the intelligence community and quickly operationalize information gained from intelligence authorities. They also work with and leverage the platforms, accesses, or capabilities of multinational partners. Finally, militarily effective information forces are delegated the authority to seize the initiative and exploit opportunities. Tailored authorities are delegated to information forces at the lowest appropriate echelon, and coordination mechanisms are streamlined to ensure that information forces can rapidly employ existing and new capabilities.²⁴

All told, information forces are a critical component of joint force efforts to reliably generate information advantage and win the time-based competition for superior decision-making. Information forces efficiently integrate information-related capabilities, enabling them to fight as a whole. They also synchronize information-related capabilities with other military capabilities as part of a combined arms approach. In addition, information forces have tailored support structures to sustain information advantage activities for the duration of a campaign. Effective information forces are also built to be effortlessly interoperable with joint, interagency, and multinational partners. As Patton noted in 1941: "Team play wins. You musicians of Mars . . . must come into the concert at the proper place and at the proper time."²⁵ Information forces are the newest addition to the musicians of Mars.

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Appendix B Third Army Organizational Charts



Figure B.1. Third Army G-2 Section organizational and functional chart

Source: Third United States Army, After Action Report Third US Army 1 August 1944–9 May 1945: Volume II, Staff Section Reports, G-2 (Regensburg, DE: May 1945), 4, Combined Arms Research Library, World War II Operational Documents.



Figure B.2. Third Army G-3 Section organizational and functional chart.

Source: Third United States Army, After Action Report Third US Army 1 August 1944–9 May 1945: Volume II, Staff Section Reports, G-3 (Regensburg, DE: May 1945), 4, Combined Arms Research Library, World War II Operational Documents.



Figure B.3. Third Army Signal Section organizational and functional chart.

Source: Third United States Army, After Action Report Third US Army 1 August 1944–9 May 1945: Volume II, Staff Section Reports, Signal (Regensburg, DE: May 1945), 4, Combined Arms Research Library, World War II Operational Documents.



Figure B.4. Standard organization of a US Army mechanized cavalry group 1944.

Source: William Stuart Nance, "Patton's Iron Cavalry–The Impact of Mechanized Cavalry on Third Army" (master's thesis, University of North Texas, Denton, TX, May 2011), 27.

Appendix C Reference Maps



Figure C.1. Disposition of Third Army and German forces, 1 August 1944.

Source: Third United States Army, *After Action Report Third US Army 1 August 1944–9 May 1945: Volume I, The Operations* (Regensburg, DE: May 1945), 25, Combined Arms Research Library, World War II Operational Documents, https://cgsc.contentdm.oclc.org/digital/collection/p4013coll8/ id/2212.



Figure C.2. Disposition of Third Army and German forces, 7 August 1944.

Source: Third United States Army, After Action Report Third US Army 1 August 1944–9 May 1945: Volume I, The Operations (Regensburg, DE: May 1945), 31, Combined Arms Research Library, World War II Operational Documents, https://cgsc.contentdm.oclc.org/digital/collection/ p4013coll8/id/2212.



Figure C.3. Disposition of Third Army and German forces, 14 August 1944.

Source: Third United States Army, *After Action Report Third US Army 1 August 1944–9 May 1945: Volume I, The Operations* (Regensburg, DE: May 1945), 39, Combined Arms Research Library, World War II Operational Documents, https://cgsc.contentdm.oclc.org/digital/collection/p4013coll8/ id/2212.



Figure C.4. Disposition of Third Army and German forces, 21 August 1944.

Source: Third United States Army, *After Action Report Third US Army 1 August 1944–9 May 1945: Volume I, The Operations* (Regensburg, DE: May 1945), 47, Combined Arms Research Library, World War II Operational Documents, https://cgsc.contentdm.oclc.org/digital/collection/p4013coll8/ id/2212.



Figure C.5. Disposition of Third Army and German forces, 31 August 1944.

Source: Third United States Army, *After Action Report Third US Army 1 August 1944–9 May 1945: Volume I, The Operations* (Regensburg, DE: May 1945), 60, Combined Arms Research Library, World War II Operational Documents, https://cgsc.contentdm.oclc.org/digital/collection/p4013coll8/ id/2212.



Figure C.6. Territory liberated by Allied forces through 31 August.

Source: Third United States Army, *After Action Report Third US Army 1 August 1944–9 May 1945: Volume I, The Operations* (Regensburg, DE: May 1945), 63, Combined Arms Research Library, World War II Operational Documents, https://cgsc.contentdm.oclc.org/digital/collection/p4013coll8/ id/2212.

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