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**Informing the Information Joint Function:
Synergized Lexicon and Integration for Joint Force Operations**

By:

Stacie L. Voorhees

Lieutenant Colonel, USAF

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the author.

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Synergized Lexicon and Integration for Joint Force Operations**

by Stacie L. Voorhees

Lieutenant Colonel, USAF

A paper submitted to the Faculty of the Joint Advanced Warfighting School in partial satisfaction of the requirements of a Master of Science Degree in Joint Campaign Planning Strategy. The contents of this paper reflect my own personal views and are not necessarily endorsed by the Joint Forces Staff College or the Department of Defense.

This paper is entirely my own work except as documented in footnotes (or appropriate statement per the Academic Integrity Policy).

Signature: Stacie L. Voorhees

Date: 24 May 2021

Thesis Advisor:

Signature: [Signature]
Jeffrey Turner, MFA
Instructor

Approved by:

Signature: Miguel A. Peko
Miguel Peko, CAPT, USN
Director, Joint Advanced Warfighting

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Abstract

Joint Force Commanders (JFCs) and planners require integrated information capabilities and concepts for information power and relative advantage in the competition continuum. Four years since the introduction of information as a joint function, the lack of common definitions and shared lexicon, combined with disparate joint and service approaches, hinder JFC and operational artists' ability to effectively leverage information in operations. As new terms and paradigms are introduced they convey different meaning to different joint force audiences. The failure to provide clear descriptions and associations that rectify doctrinal, lexical, and conceptual dissonance adds to operational complexity instead of resolving it.

This research investigates how joint and service information approaches and definitions support integrating information capability across joint functions and into campaigning. Assessing current information concepts, capabilities, and definitions instills greater understanding across the operational community as associated joint doctrine and concepts are matured and employed. A literature review evaluated the 2018 initial framing for the information joint function and its purposes to support the JFC's understanding, ability to affect behavior, and make decisions. The review then identified where recent efforts apply different terminology and compared the joint function's purposes against joint and service efforts to advance information.

In addition to improving understanding behind information as a joint function, the research proposes four recommendations: rectify delayed doctrinal updates; improve the purposes of the information joint function; add relational clarity with other joint functions; and establish common definitions and relationships across operations in the information environment (OIE), information operations, information warfare, and information-related capabilities. The information joint function and OIE could synergize diverse information capabilities and their integration with joint functions and processes. Instead, impaired joint force understanding for information in operations directly impedes the JFC's ability to synchronize, integrate, and direct joint operations.

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Dedication

To my daughters. Digital natives who boldly adventure
through life and the information environment.

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Chapter 1: Introduction

The 2018 National Defense Strategy describes an increasingly complex global security environment defined by rapid technological change, challenges in every operating domain, and a return to long-term strategic competition between nations.¹ This expansive, globally interconnected environment is a complex adaptive system that encompasses transregional, all-domain, and multi-functional threats. These systems “resist conclusive analysis and defy permanent solutions [because they] are structurally complex and dynamic, and behaviorally adaptive.”² Constantly changing factors, actors, and unknown causal dependencies pose challenges for assessment, problem-solving, and decision-making. The environment’s characteristics and interactions create opacity when omniscience is desired for effective military operations. The intransparency, “or the inability to know everything one would like to know,” generates “high demand on a planner’s capacities to gather information, integrate findings, and design effective actions.”³ Given that information is needed to provide clarity to complexity, intransparency creates a planner’s paradox: complex adaptive systems both necessitate and complicate the understanding and decisions needed to synchronize efforts across multiple services, agencies, and domains.

Complexity alters joint force thinking and language in two significant areas. First, complexity drives doctrinal updates embracing the *competition continuum*. The competition continuum provides a new framework to understand, describe, and engage with various actors in an operational environment with mixed levels of cooperation, competition, and armed conflict.⁴ Second, it elevates the role of information’s importance

¹ U.S. Department of Defense, Summary of the 2018 National Defense Strategy (Washington, DC: Department of Defense, 2018), 1-2.

² Andrew Hill and Dale Watson, "Leadership at the Strategic Level," in *Strategic Leadership: Primer for Senior Leaders*, 4th ed., eds. Tom Galvin and Dale Watson (Carlisle, PA: U.S. Army War College, 2010), 13.

³ Dietrich Dorner, *The Logic of Failure: Recognizing and Avoiding Error in Complex Situations* (New York: Perseus Books Group, 1996), 37-38.

⁴ U.S. Chairman of the Joint Chiefs of Staff, "Joint Doctrine Note 1-19: Competition Continuum," (Washington, D.C., 2017), 2-3.

for joint operations. Complexity generates a greater imperative to know more across the operational environment, associate meaning to and influence the actions of relevant actors, and make informed decisions. This complexity creates a paradigm shift from information as just supporting or enabling capabilities to information as integral to all operations. The shift necessitates new doctrine, operating constructs, and terms. In turn, the understanding of information concepts and definitions guide how capabilities are developed and employed.

Thomas Kuhn popularized the term “paradigm shift,” explaining that “paradigms gain their status because they are more successful than their competitors in solving a few problems that the group of practitioners come to recognize as acute.”⁵ As new paradigms emerge, practitioners begin subsequent guiding research and efforts without “a full interpretation or rationalization.”⁶ Doctrine, concepts, and strategies guide military research and experimentation into the acute complications of engagement across the competition continuum and joint force use of information. Concepts are developed and tested, strategies are actioned, and the prevailing elements are eventually codified in doctrine. In many cases, however, the full interpretation and rationale, as Kuhn suggests, are overlooked as only portions of the new paradigm’s requirements are discussed and actioned. When concurrently executing operations and developing new approaches the progress and developments are often unknown by all vested practitioners, certain solutions are adopted by portions of the practitioners, and different terminology and interpretations hinder shared understanding and effectiveness. The confusion associated with new paradigms often takes time and deliberate effort to surmount. Information as a joint function is currently at such a juncture.

Reflecting the new paradigm for information’s importance, information was

⁵ Thomas S. Kuhn, *The Structure of Scientific Revolutions: 50th Anniversary Edition* (Chicago, IL: The University of Chicago Press, 1996), 24.

⁶ Kuhn, 44.

established as the seventh joint function with the July 2017 out-of-cycle update to Joint Publication 1, *Doctrine for the Armed Forces of the United States*. This significant update designated information as applicable to all operations, tantamount to the command and control and intelligence functions.⁷ The following year, Joint Publication 3-0, *Joint Doctrine for Operations*, added that the information function “helps commanders and staffs leverage the pervasive nature of information, its military uses, and its application during all military operations.”⁸ Information *in* operations is the employment of the information joint function. Additionally, JP 3-0 states the information joint function consists of activities that:

- 1) facilitate Joint Force Commander (JFC) understanding of the role of information in the operational environment,
- 2) facilitate the JFC’s ability to leverage information to affect behavior, and
- 3) support human and automated decision-making.⁹

Effectively, the three activities capture the role of information in operations as having three purposes for the JFC: understand, affect behavior, and support decision-making.¹⁰

While the three purposes should be an effective framing, the supporting content and activities are largely recycled from various subordinate joint doctrine without new analysis, explanation, or relational clarity across the joint functions. Including information as a joint function begins to address the planner’s paradox; however, internal discrepancies exist within the DoD regarding the meanings of terms and how to employ information in operations. The full interpretation and rationalization for employing

⁷ U.S. Joint Chiefs of Staff, "Joint Publication 1: Doctrine for the Armed Forces of the United States. Incorporating Change 1, July 12, 2017," (Washington, D.C., 2017), I-19.

⁸ U.S. Joint Chiefs of Staff, “Joint Publication 3-0: Joint Operations,” (Washington, D.C., 2018), xiii.

⁹ *Ibid.*, III-17.

¹⁰ The thesis hereon reframes the JP 3-0 phrase “includes activities” by replacing activities with “purpose” to support the analysis. This also avoids lexical confusion of describing activities of activities, and the additional thesis discussion of Operations, Activities, and Investments.

information in operations is incomplete.

Current joint doctrine does not fully convey how to execute the information joint function in operationally employable constructs and capabilities. Four years after information became a joint function, current paradigms for information in operations are still not reflected in an updated or replaced JP 3-13, *Information Operations*. Certain information activities and capabilities in JP 3-0 clearly correlate to joint functions while others require additional inference. Some terms associated with information have immense technical meaning to practitioners, while the same terms in other communities have become hollow buzz words, devoid of real meaning and underrepresenting implementation difficulties. A lack of shared understanding, internal and external to the functional communities and services, creates additional demands for interpretation, advanced practitioner knowledge, and supplementary communication during planning and execution. Service-level initiatives continue to bridge the lexical and conceptual gaps, complementing and informing joint capabilities and doctrine. However, the joint and service approaches and terminology are not fully synchronized.

Definitions matter. As practitioners grapple with new paradigms and terms, it can lead to large variance of interpretation and application within functional areas, services, and joint and coalition environments. Some definition variance is generally accepted in practice and as new paradigm elements solidify through experimentation and utilization. As strategist Everett Dolman explains, “definitions are not required in order to think deeply about a subject, though they are extremely useful for productive debate. When two sides are arguing past each other, it is generally because they have not agreed on basic terms.”¹¹ However, problems arise when the same terms have different meanings to the planners, providers, and practitioners across the joint force. Not everyone may be

¹¹ Everett C. Dolman, “Seeking Strategy,” in *Strategy: Context and Adaptation from Archidamus to Airpower*, eds. Richard Bailey, James Forsyth, and Mark Yeisley, (Annapolis: Naval Institute Press, 2016), 7.

aware of new operating concepts or understand the language to mean the same thing. Specifically, with information now as a joint function, and the lexicon from doctrine and new concepts intermixed with current and updated practices, how a leader or planner understands the terms can have substantial implications for what they expect of their staff and service-provided forces.

For the military, *The Department of Defense Dictionary of Military and Associated Terms* (DoD Dictionary) lists adopted doctrinal definitions and their sources. The document serves as the central reference for the doctrinal meaning of widely utilized military terms. Following the addition of the information joint function, the DoD Dictionary revised the joint function definition to: "Related capabilities and activities placed into seven basic groups of command and control, information, intelligence, fires, movement and maneuver, protection, and sustainment to help joint force commanders synchronize, integrate, and direct joint operations."¹² Additionally, the 2020 version of the DoD Dictionary continues to carry forward information-related terminology from the 2014 version of Joint Publication 3-13, *Information Operations*. However, neither the DoD Dictionary nor JP 3-0 list specific definitions for information, information power, Operations in the Information Environment (OIE), information warfare, or other terms widely utilized in current information-related literature. The lack of specific definitions and associated capabilities makes it difficult to fully realize the three purposes for information in operations.

In the absence of deliberate efforts to address the remaining shortcomings associated with the paradigm shift and lexicon, employing information in operations will suffer from the lack of shared understanding and divergent conceptual development. The joint force and services will continue operating with new and legacy definitions that vary

¹² U.S. Joint Chiefs of Staff, "Department of Defense Dictionary of Military and Associated Terms," (Washington, D.C., 2021), 117. Previous editions of this dictionary were Joint Publication 1-02, but the 2020 update removes joint publication designation. Many will still commonly reference JP 1-02 as the DoD Dictionary. The thesis uses DoD Dictionary for all references.

capabilities across joint and service doctrine, strategy, and concepts. In addition to understanding the complexity of the operational environment, joint planners will continue to wade through a morass of muddled meaning and terminology to understand and employ information capabilities. Intransparency will exacerbate missed opportunities with words and concepts that convey different meaning to different audiences.

Now, JFCs and planners require integrated information capabilities and understanding *now* for information power and relative advantage in the competition continuum. There are significant joint staff and service efforts to advance information capability for the DoD; however, the joint and service efforts are somewhat disparate, with service efforts often implemented more quickly. The primary joint doctrine for information operations is still dated 2014, and the JP 3-0 updates do not convey how to operationally integrate the information joint function. Methods of integration with other joint functions are often buried or conflated. Capability and cross integration are not clearly translated for application and employment by planners, providers, or practitioners. Disparate interpretation and rationalization is encouraged with the introduction of several new terms including “informational power” and “Operations in the Information Environment” (OIE). If OIE is the prevalent DoD and joint force term denoting the operational concept, it must be defined. Necessary steps include clarifying OIE’s affiliations with information operations and information warfare, both of which are prevalent terms throughout the services and unlikely to go away. The nascent conceptualization of the information joint function, and lack of codified information doctrinal definitions and relationships, hinder advancement of information in operations and the JFC’s and operational artists’ ability to effectively leverage information to understand, make decisions, and generate effects in the complex operational environment.

Methods

The problem regarding full understanding and realization of the information joint

function warrants addressing the information and information-related capabilities necessary for success in the current operational environment. The extensive literature and the lack of distillation of that recent material is a key obstacle to understanding and resolving the research problem. A literature review is the best method to address that problem because it focuses on sorting and understanding large quantities of publications and then distilling the information into relevant categories and topics. There are two categories most appropriate for the current research problem: identifying current information doctrine, concepts, capabilities, and definitions; and discerning joint and service efforts to conceptualize, apply, and integrate information in operations.

Conducting the literature review serves the broader steps of analysis for addressing the research problem. First, it identifies the operational framework and needs of military practitioners. Second, it sorts the ideas and information while identifying where related concepts and efforts apply different terminologies for capabilities and actions. Third, it compares the joint and service efforts to the purposes of the information joint function listed in JP 3-0. The review highlights gaps in processes and disparate understandings that hinder joint force efforts to effectively leverage information in operations.

The research limits its inquiry to joint and service approaches related to information as a joint function, information power, and information capabilities. It does so with the acknowledgment that generating effects with these capabilities should be factored in conjunction with holistic joint, interagency, intergovernmental, and multinational (JIIM) considerations, and that agencies outside of the DoD have related capabilities and requirements to engage in the information environment. JIIM integration should be addressed during the joint planning process. Although the ideas addressed in the research support the joint planning process, they may have relevance for interagency, coalition, and other capabilities.

The benefits of the literature review add clarity and purpose to streamline the

immense investments in capabilities, talent development and management, authorities, business processes, and technical integration for information in operations. Multiple doctrinal and service updates released since 2017 rapidly introduced new concepts to the DoD—a vast community with many practitioners unaware of the efforts and mechanisms behind developing joint capabilities. Assessing current information concepts, capabilities, and definitions instills greater understanding across the operational community as the joint force further advances and employs the information joint function.

Finally, the research assumes that maturing the information joint function and its associated capabilities is an iterative process. A foundational element is to unify shared understanding and terminology so approaches and employment for planners, practitioners, and providers are synergistic rather than divergent. The research aims to support baseline knowledge for information in operations, to associate joint and service initiatives supporting the three purposes for the information joint function, and to standardize the meaning and employment associated with these initiatives. The paper further contributes to the body of knowledge by providing recommendations to unify the understanding, construct, and lexicon for information in operations.

Chapter 2: Doctrine and Delayed Delivery

Multiple joint doctrine updates and concepts released since 2017 reflect new approaches for how the joint force engages a complex operational environment. While the institutional processes are not new, knowledge of joint doctrine, functions, planning, and the Joint Force Development and Design (JFDD) process provides foundational context for how recent information in operations efforts support Joint Force Commanders (JFCs), planners, and practitioners. The DoD itself is also a complex system. Experience, exposure, and education through joint and service assignments affect an individual's knowledge of institutional doctrine, processes, and current initiatives. Joint processes and documents can unify against disparate tactical and service experiences, but only if one is informed of the joint intent, resources, and efforts. This chapter reviews and summarizes doctrinal and development purpose and efforts, then assesses recent doctrine and concepts for key themes, capabilities, and relationships surrounding the development of the information joint function. The review highlights where joint force efforts to resolve the planner's paradox with new understanding and capabilities simultaneously exacerbate the planner's paradox through unclear additions and delayed codification.

Jointness

Jointness is “the fundamental organizing construct at all echelons” for the Armed Forces of the United States.¹ Driven by previous disasters in operational integration and reinforced by law with the Goldwater-Nichols Department of Defense Reorganization Act of 1986, jointness acknowledges there are both distinct and overlapping capabilities across military services. Joint forces must be interoperable and avoid “technical, doctrinal, and cultural barriers that limit the ability of JFCs to achieve objectives.”² In turn, joint doctrine enhances “the operational effectiveness of joint forces by providing

¹ U.S. Joint Chiefs of Staff, “Joint Publication 1: Doctrine for the Armed Forces of the United States,” (Washington, D.C., 2017), I-2.

² Ibid., I-2.

fundamental principles that guide the employment of US military forces toward a common objective.”³ Joint Publication 1, *Doctrine for the Armed Forces of the United States*, is the capstone doctrinal publication with fundamental principles and overarching guidance.⁴ JP 3-0, *Joint Operations*, is the keystone publication for joint warfighting execution and JP 5-0, *Joint Planning*, provides doctrinal foundations for planning joint campaigns and operations.⁵ Doctrine creates shared understanding for operations at echelon by establishing taxonomy, relationships, principles and guidance to support unified action.⁶ Consistent and repeated phrasing and explanations across doctrine and concepts, known as intertextuality, fosters shared meaning by reinforcing expectations and applications. Joint doctrine should precede service actions and inform them, but in many cases service efforts are ahead and inform joint doctrine. In the best case, doctrine, concepts, and supporting capabilities are developed concurrently since the operational necessity that initiates change cannot wait.

Commanders achieve operational effectiveness by integrating and synchronizing capabilities through the Joint Planning Process and operational design. Joint planning allows leaders to understand the environment and resources to determine the best methods for employing the DoD’s capabilities to achieve national objectives.⁷ Joint functions group capabilities, providing a standard framework for integrated planning across forces. The JFC, and his or her planners, are responsible for the operational art and synchronization of forces and capabilities in time and space for mission accomplishment. Even when instructions and guidance are clearly articulated in doctrine and other manuals, significant effort and resourcing are still required to make concepts operational

³ U.S. Joint Chiefs of Staff, “Joint Publication 1: Doctrine for the Armed Forces of the United States,” ix.

⁴ Joint Electronic Library, <https://www.jcs.mil/Doctrine/Joint-Doctrine-Pubs/>

⁵ Ibid.

⁶ U.S. Joint Chiefs of Staff, U.S. Joint Chiefs of Staff, “Joint Publication 1: Doctrine for the Armed Forces of the United States,” i.

⁷ U.S. Chairman of the Joint Chiefs of Staff, “Joint Publication 5: Joint Planning,” (Washington, D.C., 2017), xi.

and effective in practice. Because definitions and understanding drive action, the operational art and successful capability employment only increases in difficulty when descriptions and lexicon are conflated or lack clarity.

JFDD provides a deliberate process to plan and develop the joint force through “concept development, assessment, and capability development” with coordination through the Joint Requirements Oversight Council (JROC).⁸ The JROC is chaired by the Vice Chairman of the Joint Chief of Staff, operates in accordance with United States Code, and receives inputs from service chiefs, under secretaries of defense, combatant commanders, and the joint staff. The JROC assesses joint military capabilities and identifies, approves, and prioritizes capability gaps and requirements for national defense.⁹ The JROC also has oversight on joint concepts that propose methods, mindsets, and capabilities for the joint force “to maintain military advantage against current and emerging threats.”¹⁰ Joint concepts are idea-focused and relay strategic and operational considerations based on analysis, experimentation, wargaming, and exercises as materiel and non-materiel solutions are further matured and realized.¹¹ Although joint concepts are not prescriptive, they are a non-material solution helping to inform the Joint Doctrine Development Process (JDDP).¹² These processes and products all foster jointness.

New Concepts and New Joint Function

Recent concepts demonstrate deliberate action to popularize paradigms and lexical shifts for successful joint operations in the complex strategic and operational environment. The *Joint Concept for Integrated Campaigning* (JCIC), released March

⁸ U.S. Chairman of the Joint Chiefs of Staff, “CJCSI 3030.01 Implementing Joint Force Development and Design,” (Washington, D.C., December 2019), A-3.

⁹ U.S. Chairman of the Joint Chiefs of Staff, “CJCSI 5123.01H Charter of the Joint Requirements Oversight Council (JROC) and the Implementation of the Joint Capabilities Integration and Development System,” (Washington, D.C., August 2018), A-4.

¹⁰ U.S. Chairman of the Joint Chiefs of Staff, “CJCSI 3030.01 Implementing Joint Force Development and Design,” C-2.

¹¹ U.S. Joint Chiefs of Staff, “Joint Publication 1: Doctrine for the Armed Forces of the United States,” VI-9.

¹² U.S. Chairman of the Joint Chiefs of Staff, “CJCSI 5120.01B, Joint Doctrine Development Process,” (Washington, D.C., November 2020), 1.

2018, explains that joint force actions constantly shape the operational environment, describing new methods and lexicon for conducting operations in the competition continuum.¹³ Joint Doctrine Note (JDN) 1-19, *Competition Continuum*, explains the continuum is comprised of cooperation, competition, and armed conflict, and provides “a better framework for understanding, describing, and participating within a competitive operational environment.”¹⁴ As part of the paradigm shift, the JCIC and JDN 1-19 both caution commanders, planners, and practitioners against ingrained constructs that oversimplify the environment and actors; maintain artificial distinctions between armed conflict, peace, and cooperation; and generate false confidence in institutional advantages.¹⁵ Additionally, JDN 1-19 reinforces the notion that “in enduring competitions, the joint force does not win or lose but is in the process of winning or losing. Every setback contains the possibility of future success, and every victory, the seeds of potential failure.”¹⁶ Orienting, discerning, assessing, and providing options for the JFC across the competition continuum increases the need for understanding, influence, and decisions. Clarity and action amidst the complexity is promoted by implementing information as a joint function. Achieving clarity entails clearly defining and understanding the elements.

In 2017, the elevated importance of information resulted in its designation as a joint function and necessitated updates to JP 1, *Doctrine for the Armed Forces of the United States*, JP 3-0, *Joint Operations*, and JP 3-13, *Information Operations*.¹⁷ The Joint Staff Deputy Director for Global Operations described the elevation of information as a joint function as

¹³ U.S. Chairman of the Joint Chiefs of Staff, “Joint Concept for Integrated Campaigning,” (Washington, D.C., 2018), vi.

¹⁴ U.S. Chairman of the Joint Chiefs of Staff, “Joint Doctrine Note 1-19: Competition Continuum,” (Washington, D.C., 2019), v.

¹⁵ *Ibid.*, 1.

¹⁶ *Ibid.*, 7.

¹⁷ The 2014 JP 3-13, *Information Operations* is to be replaced by JP 3-XX, *Information in Joint Operations*, which remains in draft and coordination at the time of this research.

a call to action for the joint force to move rapidly to build information into operational art and design in order to deliberately leverage the informational aspects of military activities...[and] an important first step toward enhancing warfighting across all domains and the information environment.¹⁸

Additional research provides five reasons for elevating information as a joint function: the world has changed; adversaries' use of information has changed; the joint force is vulnerable to attacks in and through the information environment; joint force actions send a message—intended or otherwise; and outcomes and end states for joint force operations hinge on the perceptions and behaviors of relevant actors.¹⁹ Thus, the information joint function is a cornerstone for all joint operations.

The 2018 *Joint Concept for Operations in the Information Environment* (JCOIE) complements information's establishment as a joint function, the competition continuum, and integrated campaigning. The concept's central idea is “the Joint force must build information into operational art to design operations that deliberately leverage the inherent informational aspects of military activities.”²⁰ It advocates several valuable supporting ideas. First, the JCOIE promotes the need to understand information, the informational aspects of military activities, and informational power.²¹ Second, it supports institutionalizing and operationalizing the integration of physical and informational power thereby elevating information in strategy and operational art.²² Third, the JCOIE identifies concerns related to inadequate understanding of the operational environment, ambiguity of doctrine and terminology, and the need for

¹⁸ Alexis G. Grynkeiwich, “Introducing Information as a Joint Function,” *Joint Forces Quarterly*, 89 (Second Quarter 2018): 7.

¹⁹ Scott K. Thompson, and Christopher E. Paul, “Paradigm Change. Operational Art and the Information Joint Function.” *Joint Forces Quarterly*, 89 (Second Quarter 2018): 9.

²⁰ U.S. Chairman of the Joint Chiefs of Staff, “Joint Concept for Operations in the Information Environment,” (Washington, D.C., 2018), viii.

²¹ *Ibid.*, viii.

²² *Ibid.*, viii-ix.

common understanding, lexicon, and capabilities to support coherent joint formations.²³ Although the document introduces several new terms and phrases, failure to define “operations in the information environment” and other important terminology creates confusion that is further discussed in Chapters 3 and 5 of this paper. Furthermore, ideas in this concept have yet to materialize in an updated or replaced Joint Publication dedicated to information.

Chapter Conclusion

Jointness is a mission essential concept for conducting operations and must be considered for information in operations. Although not always expedient, joint force doctrine and development is mature in its descriptions and processes for planning and joint operations. The descriptions and designated processes are vital to planners, providers, and practitioners guiding forces toward common objectives. Newer joint force concepts for the competition continuum and campaigning provide clear constructs for additional planning considerations in the current operating environment and the need for information to support operational success. The JCOIE continues to advance some portions of the paradigm but simultaneously introduces confusion by not providing clear definitions. Although a large consensus exists regarding the need to better incorporate information into the operational art necessary for joint force campaigning, outside of initial JP 1 and JP 3-0 updates, additional doctrinal codification for information in operations is absent.

²³ U.S. Chairman of the Joint Chiefs of Staff, “Joint Concept for Operations in the Information Environment,” 7-8 & 20.

Chapter 3: Understanding Information

Information concepts, definitions, and lexicon are nuanced and conflated as unique phrases are often adopted instead of associations with common joint planning language. Such lexical strife adds confusion instead of clarity and exacerbates a planner's ability to synchronize forces and capabilities across multiple services, agencies, and domains. Recognizable language and phrasing patterns across doctrine support shared understanding and application across the joint force.¹ Thus, the Joint Force Commander's (JFC) ability to utilize information and integrate it with all joint functions requires addressing the multiple meanings that foundational information terms have to diverse audiences while simultaneously understanding the correlation of information terms and application to other doctrinal terms and capabilities. JP 3-0 identifies "understand[ing] information in the Operational Environment (OE)" as the first purpose for the information joint function.² This chapter reviews JP 3-0's first purpose for the information joint function; the literature's descriptions of information, the information environment, information power, and information-related capabilities; and how information is integrated into planning. With the introduction of new concepts and terms to advance information, the lack of common doctrinal associations reveals a conceptual frame of information terms that are synonymous, different, and developing when they should be clearly articulated to support understanding for planners, providers, and practitioners.

Information—Definition and Defining Role

Despite the prevalence of the word "information" throughout military documents and the English language, the term is surprisingly not defined in the DoD Dictionary. The lack of definition complicates an understanding of the role of information in operations.

¹ Ellen Barton, "Linguistic Discourse Analysis: How the Language in Texts Work," in *What Writing Does and How it Does it*, ed. Charles Bazerman, and Paul Prior (New Jersey: Lawrence Erlbaum, 2004), 86-87.

² U.S. Chairman of the Joint Chiefs of Staff, "Joint Publication 3-0: Joint Operations," III-19.

As Dr. Christopher Paul notes, the DoD Dictionary includes “ten separate terms that begin with the word ‘information’ and even more that include it as a second or subsequent term, and even more still that include ‘information’ in their definitions.”³ To compensate for the omission, JP 3-13, *Information Operations*, has consistently provided a military definition for information since its initial publication in 1998.⁴ The current definition, “data in context to inform or provide meaning for action,” succinctly encapsulates the broad meaning and purpose of information for military operations.⁵ It does not strictly focus on behaviors. The definition remains applicable across the multitude of applications for information in operations including its three joint function purposes of supporting JFC understanding, leveraging information to affect behavior, and human and automated decision-making.

The JP 3-0 information joint function’s first purpose rightly reinforces that the JFC must “understand the role of information in the OE” but lacks specificity. The JP 3-0 section explains the action is executed in conjunction with intelligence joint function activities; includes determining relevant actor perceptions and decisions; and it is necessary to develop language, regional, and culture expertise.⁶ The JP 3-0 description and allusion to the joint intelligence preparation of the operational environment (JIPOE) process does not clearly articulate if understanding the role of information in operations is inherently the same as JIPOE or something different. Instead, the elaboration repeats intelligence joint function activities, such as JIPOE, a well-established joint operations process to “help the commander and staff understand the complex and interconnected

³ Christopher E. Paul, “Understanding and Pursuing Information Advantage.” *Cyber Defense Review* 5 no. 2 (Summer 2020), 116.

⁴ The 1998 JP 3-13 defines information as “1. Facts, data, or instructions in any medium or form. 2. The meaning that a human assigns to data by means of the known conventions used in their representation” and these definitions were also included in the DoD Dictionary.

⁵ Chairman of the Joint Chiefs of Staff, “Joint Publication 3-13: Information Operations,” (Washington, D.C., 2014), I-3.

⁶ U.S. Joint Chiefs of Staff, “Joint Publication 3-0: Joint Operations,” III-17-18

operational environment.”⁷

Understanding the OE is imperative for operations. Understanding information, in this case the impact of the information environment on military operations, is already part of JIPOE. As explained, the first purpose of JP 3-0 seems to allude to understanding the information environment as a portion of the operational environment. Emphasizing the need to understand the information environment is an appropriate first purpose for the information joint function, and correlates well with the elevation of information’s importance in operations. However, JP 3-0’s description and ambiguous allusion to JIPOE does not clearly articulate if the intent is to understand the broad roles of information in operations, conduct JIPOE, or add focus to how the information environment impacts the operational environment.

The Information Environment—Domains, Dimensions, and Aspects

Understanding the information environment is crucial to comprehensively understanding the operational environment. The information environment construct supports the joint force’s understanding of where information exists along with how it flows and interacts with other elements in the operational environment. Across the literature, the information environment is described as consisting of domains, dimensions, or aspects. The continued use of sub-delineations for the information environment warrants a closer analysis of the conceptualizations’ history and effects.

The tendency to consider information as a *domain* largely stems from previous joint operational constructs and the continued use of physical domains to describe where war and warfare occur. In the early 2000s, Network Centric Warfare (NCW) served as the central paradigm and operational construct adopted by the DoD to address the challenges of the information age, modern technology’s impact on the nature of warfare,

⁷ JP 2-0, *Intelligence*, x. Chairman of the Joint Chiefs of Staff, “Joint Publication 2-0: Joint Intelligence,” (Washington, D.C., 2013), x.

and human behavior across a globally networked environment.⁸ The NCW construct popularized that warfighting occurs across interconnected domains, explaining that the information domain is “where information is created, manipulated, and shared . . . [facilitating] the communication of information among warfighters.”⁹ It exists and interacts with (1) the social domain—where humans interact and share culture; (2) the cognitive domain—the mind of the warfighter focused on aligning commander's intent and tactics to deliver effects-based operations; and (3) the physical domain—land, sea, air, and space environments where forces move through time and space.¹⁰ The four domain descriptions are canted towards the military practitioner and were not specifically codified in doctrine; however, they continue to progress through newer operational concepts and doctrine. Joint doctrine presently acknowledges air, land, sea, and space as physical domains where conflict occurs.¹¹ Additionally, doctrine acknowledges cyberspace as a global domain within the information environment that depends on and transcends the physical domains.¹² Furthermore, non-doctrinal literature and some concepts advocate a human domain as another way of addressing the cognitive and social elements of human decisions, interactions, and conflict that must be considered by the operational artist.¹³ Despite consistent informal and legacy references to “domain,” the information domain’s meaning is synonymous with the current use of the term “information environment.”

The DoD Dictionary and JP 3-13 define the information environment as “the aggregate of individuals, organizations, and systems that collect, process, disseminate, or

⁸ Office of Force Transformation Office of the Secretary of Defense, *The Implementation of Network-Centric Warfare*, (Washington, D.C., 2005), I-II.

⁹ *Ibid.*, 20

¹⁰ *Ibid.*, 20.

¹¹ Cleveland et al., *Military Strategy for the 21st Century: People, Connectivity, and Influence* (Amherst, NY: Cambria Press, 2018) 6-7. The DoD Dictionary of Military Terms does not define domain, but accounts for domains based on the physical domain where conflict occurs.

¹² Chairman of the Joint Chiefs of Staff, “Joint Publication 3-12: Cyberspace Operations,” (Washington, D.C., 2018), I-2.

¹³ Cleveland, 5-12.

act on information.”¹⁴ The information environment permeates the physical domains and therefore exists in every operational environment. The definition has remained mostly consistent in joint doctrine since the 1990s, although updates to the conceptualization were added over the years, such as introducing the current concept of *dimensions* in the 2006 version of JP 3-13.¹⁵

In current doctrine, the information environment consists of three interrelated dimensions with consistent interactions between individuals, organizations, and systems.¹⁶ The dimensions include the (1) physical dimension—tangible, real-world elements such as command and control systems, key decision-makers, and the infrastructure and networks that transport information; (2) the informational dimension—data-centric, consisting of the where and how information is collected and processed; and (3) the cognitive dimension—human-centric, comprising the mind and mental processing.¹⁷ Adding the physical, informational (data), and cognitive dimensions in the conceptualization was a deliberate and valuable step for the joint force. It addressed the complexity of how information was transmitted and processed between humans and systems and coalesced the NCW’s information, social, and cognitive domains into the information environment.

However, some of the descriptions and examples generate confusion. For instance, military decision-makers are part of the physical dimension, yet other actors and their decisions are part of the cognitive dimension. Additionally, network transport is physical, but the information collecting and processing traversing that network transport is part of the informational dimension. The overlaps and naming one of the dimensions as

¹⁴ DoD Dictionary, 104.

¹⁵ Dan Kuehl, and Leigh Armistead, “Information Operations: The Policy and Organizational Evaluation,” in *Information Warfare: Separating Hype from Reality*, ed. Leigh Armistead (Washington, D.C.: Potomac Books, Inc., 2007), 11. The 1998 version of JP 3-0 defined the information environment as “the aggregate of individuals, organizations, or systems that collect, process, or disseminate information, including the information itself.”

¹⁶ Chairman of the Joint Chiefs of Staff, “Joint Publication 3-12: Cyberspace Operations,” (Washington, D.C., 2018), viii.

¹⁷ U.S. Joint Chiefs of Staff, “Joint Publication 3-13: Information Operations,” I-I-3.

“informational” obfuscate delineations and cause further confusion for the joint force.

The 2018 *Joint Concept for Operations in the Information Environment* (JCOIE) critiques the JP 3-13 information environment model as too transmission centric while advocating a meaning-based model to "address how audiences with differing worldviews interpret and contextualize information."¹⁸ Acknowledging that this is a concept and not formal doctrine, it also proposes a significant update to the information environment's definition as

comprised of and [aggregating] numerous social, cultural, cognitive, technical, and physical attributes that act upon and impact knowledge, understanding, beliefs, world views, and, ultimately, actions of an individual, group, system, community, or organization. The IE also includes technical systems and their use of data. The IE directly affects and transcends all OE.¹⁹

Furthermore, instead of domains or dimensions, the JCOIE promotes informational, physical, and human *aspects*.²⁰ Informational aspects are sensory inputs the individual interprets and uses to assign meaning and reflect “how individuals, systems, and groups communicate and exchange information.”²¹ Physical aspects are material characteristics “that create restraints and freedom on the people and information systems that operate in it” and are critical to group identity.²² Human aspects, such as character and tradition, are “the foundation from which humans interact with other humans and their environment.”²³

¹⁸ U.S. Chairman of the Joint Chiefs of Staff, “Joint Concept for Operations in the Information Environment,” 3.

¹⁹ Ibid., 42.

²⁰ Ibid., 12-13. U.S. Chairman of the Joint Chiefs of Staff. "Joint Concept for Human Aspects of Military Operations." (Washington, D.C., 2016). Aspects are a central element for the 2016 Joint Concept for Human Aspects of Military Operations (JC-HAMO), reinforcing the centrality of human will in war and the importance of understanding human interactions with each other and the environment. In contrast to the three aspects in the JCOIE, the JC-HAMO uses the interaction between five informational, physical, social, cultural, and psychological *elements* to associate meaning. Additionally, instead of providing visualization for the interaction between the three aspects to support general joint force understanding, the JCOIE selectively references advanced models, such as the Cognitive Hierarchy Model and Sentient Information Mode. These may be used by some of the specific practitioners, but are not currently doctrinal.

²¹ Ibid., 4.

²² Ibid., 4.

²³ Ibid., 4.

The JCOIE's information environment and attribute proposals are largely centered on what are currently cognitive elements of the information environment.

The JCOIE's meaning-based model rightly highlights that all joint force actions have perceived meaning to various actors; however, the human-centric and highly contextual conceptualization may contribute to the general planner's paradox of adding confusion instead of clarity. While the new definitions and specificity attempt to address the challenges of assessing and quantifying the effectiveness of actions to influence behaviors, it is a significant shift from the current information environment definition and description and may be too cumbersome for general retention and employment. Additionally, the conceptualization inadvertently excludes elements of the traditional information environment required for the other activities and capabilities associated with information as a joint function. For example, framing the information environment in terms of meaning-based informational, physical, and human aspects furthers doctrinal and understanding dissension by negating where the cyber domain currently exists as a domain within the information environment.

The literature review reveals alternate information environment framings independent of confusions imposed with domain, dimension, and aspect sub-delineations. For example, the "3C" Connectivity, Content, and Cognition model includes (1) the ability to exchange information (connectivity), (2) the actual information (content), and (3) the meaning and impact of human beliefs and behaviors (cognitive effect).²⁴ The 3C model is not currently in joint operational constructs or doctrine. Its simplicity offers the military professional and planner relevant context and understanding of the information environment while not drastically changing the nature of the information environment's dependencies across joint functions and operations. It addresses the way information is transmitted, the information being transmitted, and the human responses to the

²⁴ Dennis Murphy, and Daniel Kuehl, "The Case for a National Information Strategy," *Military Review* (September – October 2015): 77.

information. Furthermore, the 3C model's mnemonic and lack of technical jargon supports shared understanding across military, civilian, and interagency applications.

Information—Relating Power and Capabilities for the JFC

“Information power” is another broadly used, yet undefined, term with various correlating representations over the years including “information superiority,” “information dominance,” and most recently “informational power” and “information advantage.” Additionally, doctrine accounts for information as one of the four instruments of national power. JP 1-0, however, does not specifically define information power but describes its importance and execution in conjunction with diplomatic, military, and economic power.²⁵ Power reflects the strength and ability to operate in one's interests through force or influence. One way to consider information power is analogous to air, land, and sea power. Air Force doctrine defines air power as “the ability to project military power or influence through the control and exploitation of air, space, and cyberspace to achieve strategic, operational, or tactical objectives.”²⁶ In the framework of the definition, information power would be considered as the ability to project military power or influence through deliberate information capabilities and activities to achieve strategic, operational, or tactical objectives. Joint definitions of “information advantage” are not presently available, but under development through the JFDD process and the *Joint Warfighting Concept* and *Joint Concept for Information Advantage*.²⁷

The closest definition to information power is the term “informational power,” which was initially popularized across the joint force in the 2018 JCOIE. The JCOIE defines informational power as “the ability to leverage information to shape the perceptions, attitudes, and other elements that drive desired behaviors and the course of

²⁵ U.S. Joint Chiefs of Staff, “Joint Publication 1: Doctrine for the Armed Forces of the United States. Incorporating Change 1, July 12, 2017,” I-12.

²⁶ Department of the Air Force, “United States Air Force Doctrine Volume 1 - Basic Doctrine.” (Maxwell, AL, 2015), Chap 2.

²⁷ Theresa Hitchens, “JROC Struggles to Build ‘Information Advantage’ Requirement,” *Breaking Defense*, September 17, 2020, <https://breakingdefense.com/2020/09/jroc-struggles-to-build-information-advantage-requirement/>.

events.”²⁸ The definition is very similar in intent to the air power definition with one exception: the definition centers towards shaping and driving desired relevant actor behaviors. It does not specifically capture the JFC’s use of information to understand or make decisions although the JCOIE’s explanation suggests wider application, again highlighting a definition and application disconnect. Per the JCOIE, the joint force applies informational power (1) to change or maintain the observations, perceptions, attitudes, and other elements that drive desired behaviors of relevant actors; (2) to protect and ensure the observations, perceptions, attitudes, decisions, and behaviors of the joint force, its allies, and its partners; and (3) to acquire, process, distribute, and employ data to enhance combat power.²⁹ Informational power can “emphasize, diminish, obfuscate, or mitigate the effect of physical military activities on the perceptions and attitudes of relevant actors.”³⁰ The JCOIE definitions explain what informational power is used for, that it should be incorporated more prevalently in operational art, and that informational and physical power should be layered. However, the JCOIE does not clearly express how to achieve greater integration through current doctrinal processes, nor does it reference the term “information-related capabilities” as means for employment. The lack of a common intertextual lexicon between the information activities and other warfighting functions hampers integration and operational success.³¹

Integrating information into planning is achieved through the inclusion and synchronization of information-related capabilities (IRCs) with other joint function activities. The DoD Dictionary and JP 3-13 define IRCs as “a tool, technique, or activity employed within a dimension of the information environment that can be used to create effects and operationally desirable conditions.”³² As part of integrated campaigning, JFCs

²⁸ U.S. Joint Chiefs of Staff, “Joint Concept for Operations in the Information Environment,” 42.

²⁹ *Ibid.*, 15.

³⁰ *Ibid.*, 27.

³¹ Nathaniel Huston, Keegan Newton, and John Runge, “Information Warfare: Tuning our Instruments to Overcome Barriers to Battlefield Harmony,” *Air and Space Power Journal* 34, no. 4 (Winter 2020): 44.

³² U.S. Joint Chiefs of Staff, “Joint Publication 3-13: Information Operations,” GL-3.

persistently conduct a wide variety of operations, activities, and investments (OAI)s to shape their operational environment.³³ IRCs are a means for campaigning, and are the means for informational power, and a well-understood term across joint and service doctrine. The JCOIE's layering of physical and informational power is already accounted for through joint force campaigning and synchronizing lethal and nonlethal effects as part of the joint fires function, which also specifically references information-related activities.³⁴ The JCOIE fails to include these common doctrinal associations in its explanations of new phrases like layering informational power.

IRC was also not included in the JP 3-0 introduction of information as a joint function and its absence suggests joint doctrine is moving away from the IRC term. When JP 3-0 introduced the information joint function description it named a series of "Joint Force Capabilities, Operations, and Activities for Leveraging Information" that are currently associated as IRCs in JP 3-13.³⁵ The IRCs include civil-military operations (CMO), cyber operations (CO), electronic warfare/electromagnetic spectrum operations (EW/EMSO), key leader engagement (KLE), military deception (MILDEC), military information support operations (MISO), operational security (OPSEC), public affairs (PA), Combat Camera, space operations, commander's communication synchronization (CCS), and special technical operations (STO).³⁶ In support of enduring outcomes, the JFC can leverage information with the "capabilities, operations, and activities [that] may reinforce the actions of assigned or attached forces, support lines of operation or lines of effort (LOE), or constitute the primary activity in a LOE." ³⁷ Including the list and

³³ U.S. Joint Chiefs of Staff, "Joint Publication 5-0: Joint Planning," I-8.

³⁴ JP 3-09 defines Fires as "the use of weapon systems or other actions to create specific lethal or nonlethal effects on a target. Fires are normally synchronized and integrated to achieve synergistic results. Fires can be delivered by air, land, maritime, cyberspace, space, or special operations forces. Employing fires in conjunction with other activities, such as information-related activities, to create desired effects is a particularly important factor in maintaining or reestablishing a safe and secure environment."

³⁵ U.S. Joint Chiefs of Staff, "Joint Publication 3-0: Joint Operations," III-22. These Joint Force Capabilities, Operations and Activities are referred to as information-related capabilities in both JP 1-0 and JP 3-13.

³⁶ Ibid., III-22-27

³⁷ U.S. Joint Chiefs of Staff, "Joint Publication 3-0: Joint Operations," III-22

explanation as a means for joint force use in operations and activities in the keystone operations doctrine is a positive step to broaden the planner's awareness and inclusion of information capabilities. Nevertheless, removing the direct association as IRCs warrants additional consideration given the prevalence of the term across joint and service policy, doctrine, and practice. Alternately, articulating “Joint Force Capabilities, Operations, and Activities for Leveraging Information include a variety of information-related capabilities” builds association between known information capabilities and how they are integrated into persistent campaigning.

Chapter Conclusion

Information as a joint function’s first purpose is to facilitate Joint Force Commander understanding of the role of information in the operational environment. Initial attempts at explaining the purpose in JP 3-0 create confusion if the commander is supposed to understand the role of information across operations, the operational environment, or the information environment. Understanding information is further complicated with implied understandings and varying descriptions for the information environment, information(al) power, and information capabilities as well as potential new framings that narrow considerations on behaviors and the human elements of the information environment. Although the JCOIE reinforces the importance of lexicon, it adds new terms to the lexicon and expands definitions at the expense of leveraging current operational vocabulary. Emerging rationalizations and additional interpretations do little to alleviate the complexity of the operational environment or simplify the operational artist and planner’s ability to quickly associate concepts and applications.

Chapter 4: Affecting Behavior--Information Operations (IO), Operations in the Information Environment (OIE), and Information Warfare

Today's military operations require persistent engagement in the information environment. Military informational capabilities are powerful means for joint force operations, activities, and investments to inform, influence, and generate effects across the continuum of cooperation, competition, and conflict. JP 3-0 identifies the ability to leverage information to affect behavior as the second purpose of the information joint function. The purpose applies "the JFC's understanding of the impact information has on perceptions, attitudes, and decision-making processes to affect the behaviors of relevant actors in ways favorable to joint force objectives."³⁸ JP 3-0 highlights three supporting tasks: influence relevant actors; inform audiences; and attack and exploit information, information networks, and systems.³⁹

How capabilities are described shapes how they are employed. Leveraging information to affect behavior is currently associated with information operations (IO) in doctrine, also now discussed in conjunction with Operations in the Information Environment (OIE), and often tied to informal and service use of "information warfare."⁴⁰ Compounding the confusion, JP 3-0 does not use IO, OIE, or information warfare in its introduction of the information joint function. There is also a trend of new definitions focusing on affecting behavior even though the capabilities are more inclusive of all elements of information in operations. A review of the doctrine and definitions, capabilities, and efforts associated with IO, OIE, and information warfare reveal continued efforts to mature the information joint function and the ability to affect behavior; however, relationships between terminology and practice are unclear, impair resolution of legacy concerns, and impede synchronized joint force understanding.

³⁸ U.S. Chairman of the Joint Chiefs of Staff, "Joint Publication 3-0: Joint Operations," III-19.

³⁹ Ibid., III-19.

⁴⁰ JP 3-13, describes the use of IRCs to influence behaviors and joint planning integration: "IO integrates IRCs (ways) with other lines of operation and lines of effort (means) to create a desired effect on an adversary or potential adversary to achieve an objective (ends)," II-1.

Joint Force Efforts from IO to OIE

IO prevailed as the preferred military information doctrinal terminology in the early 2000s. The 2001 Quadrennial Defense Review identified IO as one of six critical goals supporting DoD transformation, driving a 2003 DoD IO roadmap, and resulting in significant doctrinal updates in 2006 to Joint Publication 3-13, *Information Operations*. In addition to expanding the definition of “information environment” to include physical, human, and cognitive dimensions, that JP 3-13 update removed the term “information warfare.” Furthermore, it updated the original 1998 JP 3-13 definition of IO as “actions taken to affect adversary information and information systems while protecting our own” to its current definition of “the integrated employment, during military operations, of information-related capabilities (IRCs) in concert with other lines of operation to influence, disrupt, corrupt, or usurp the decision-making of adversaries and potential adversaries while protecting our own.”⁴¹ The update reduced vagueness by providing a clear purpose for IO: the military (who), employs IRCs (what), to affect adversaries while protecting one’s own operations (why).

Even though many capabilities and policies were advanced, IO continued to meet challenges regarding integration and understanding amongst practitioners and across the greater joint force community. For example, a 2013 RAND report for the U.S. Army, *Redefining Information Warfare Boundaries for an Army in a Wireless World*, provides a comprehensive assessment of IO doctrine and study. It identifies that “confusion stems from many sources: genuine ambiguity in the lexicon, both willful and unintentional misuse of the term, and both genuine misunderstanding [and] disagreement about what IO is and ought to be.”⁴² The report also highlights that few outside the IO community understand the definitions and diverse disciplines involved, and services tend to consider

⁴¹ Kuehl and Armistead, 10-11.

⁴² Isaac R. Porche, III, Christopher Paul, et. al, *Redefining Information Warfare Boundaries for an Army in a Wireless World*, (Santa Monica, CA: RAND Corporation, 2013), 21-23.

IO in terms of its most proficient capability instead of integrated capability employment.⁴³

In 2016, the DoD began formally using the term “Operations in the Information Environment” (OIE), releasing the *DoD Strategy for Operations in the Information Environment* in response to Fiscal Year 2014 National Defense Authorization Act requirements. The strategy addresses the necessity to (1) train, educate, and prepare the joint force as a whole for operations in the information environment; (2) train, educate, and manage IO professionals and practitioners who support the JFC, conduct IO, and integrate information-related capabilities (IRCs); (3) improve programs, partnerships, policies, authorities, technology, doctrine, and tactics for operations; and (4) update joint concepts to address the challenges and opportunities of the information environment.⁴⁴ It directly associates OIE to IO and reinforces the importance of the information environment. Additionally, it identifies the *Capstone Concept for Joint Operations*, *Joint Concept for Integrated Campaigning* (JCIC), and *Joint Concept for Operations in the Information Environment* (JCOIE) as complementary concepts to advance information integration and capability across the joint force.⁴⁵ In 2018, the JCOIE continued to propagate the term OIE.

The DoD Strategy for OIE and JCOIE complement many formal Joint Force Development and Design (JFDD) efforts that exist to bolster OIE and mature operationalization, integration, and planning for capabilities traditionally associated with IO and JP 3-13. For example, the 2019 Joint Requirement Oversight Council (JROC) Memorandum 068-19, *Operations in the Information Environment DOTmLPF-P Change Recommendations*, formalizes over fifty joint force requirements. It assigns offices of primary responsibility to address identified policy, doctrine, authorities, organization,

⁴³ Porche, Paul, et al., 22-23

⁴⁴ U.S. Department of Defense, “Strategy for Operations in the Information Environment,” (Washington, DC: Department of Defense, June 2016), Forward & 8-9.

⁴⁵ Ibid., 8-9

capabilities, training, and equipping requirements.⁴⁶ The requirements span DoD services, agencies, and commands, focusing on developing the needed solutions to synchronize and integrate OIE across all domains.

In fall 2020, the Joint Staff J-39 initiated a Strategic Multilayer Assessment (SMA) for Information in Joint Operations (IIJO). Headquarters Air Force requested the SMA for IIJO in conjunction with their service-initiated Command and Control of Operations in the Information Environment (C2OIE) efforts to bring “information to the forefront of air and space component operational-level planning, execution and assessment processes.”⁴⁷ SMA projects are prioritized, accepted, and synchronized by the J-39 Deputy Directorate for Global Operations, and “apply mixed-method approaches to study and assess the problems affecting the planning and operations of the U.S. DoD, military services, and government agencies.”⁴⁸ The SMA for IIJO includes joint and service stakeholders and consists of

literature review, expert elicitation, invited perspective reports from domain experts, a dedicated IIJO speaker series, a net assessment of comparative US-Russia-China advantages in the information environment, and modeling and simulation . . . to test key hypotheses emerging from the net assessment regarding effective integration of information in operations.⁴⁹

While concurrently informing service efforts, the SMA’s analysis, findings, and focus on operational level planning and execution directly assists the joint planner’s paradox while also improving resources for specialized practitioners.

Neither the DoD Strategy for OIE, JCOIE, or JP 3-0, however, define “Operations

⁴⁶ Vice Chairman of the Joint Chiefs of Staff, “JROCM 068-19 – Operations in the Information Environment DOTmLPF-P Change Recommendations,” memorandum, 3 July 2019. DOTmLPF-P stands for Doctrine, Organization, Training, materiel, Leadership and Education, Personnel, Facilities and Policy which are all considerations for capability-based assessments.

⁴⁷ Sandeep S. Mulgund, and Mark D. Kelly, “Command and Control of Operations in the Information Environment: Leading with Information in Operational Planning, Execution, and Assessment,” *Air and Space Power Journal* 34, no. 4 (Winter 2020), 17.

⁴⁸ NSI, *Strategic Multilayer Assessment - Integrating Information in Joint Operations*, 26 October 2020, 1-2.

⁴⁹ *Ibid.*, 2.

in the Information Environment.” The lack of definition leaves the joint force and its components to determine for themselves if OIE is something new or a replacement for IO. The DoD strategy repeatedly refers to IO, but the JCOIE omits IO. Dr. Christopher Paul points out that “notably absent is [the term] information operations. Doctrine appears to have moved away from the term without formally removing it or explicitly replacing it.”⁵⁰ Moreover, he notes that formal definitions for OIE are missing in the strategy and JCOIE, offering that

operations in the information environment are the sequence of actions with the common purpose of affecting the perceptions, attitudes, and decision-making of relevant actors. This is the new way to talk about the tasks, activities, and actions the joint force undertakes to set conditions and seek advantage in and through the information environment.⁵¹

The JROC offers a semi-formal definition for OIE articulated in the 2019 JROC 068-19 *OIE DOTmLPF-P Change Recommendations* memorandum. It defines OIE as “those activities that generate, apply, and alter information to change or maintain the perceptions, attitudes, and other elements that drive behaviors of relevant actors and the course of events.”⁵² While the definition aligns with Dr. Paul's proposed definition, the JROC 068-19 memorandum is also not doctrine, nor widely available for joint force practitioner use and understanding. Furthermore, this OIE definition is again scoped towards influencing relevant actor behavior, yet the memorandum clearly addresses capabilities for all three required joint function purposes to understand, leverage, and support human and automated decision-making. The failure to provide an encompassing and widely available OIE definition continues a trend of terminology changes that confuse joint force understanding and application.

In the same manner IO was adopted to reflect previous operational environment

⁵⁰ Christopher Paul, “Is It Time to Abandon the Term Information Operations?” The Strategy Bridge, accessed November, 2020.

⁵¹ Ibid.

⁵² Vice Chairman of the Joint Chiefs of Staff, “JROC 068-19 – Operations in the Information Environment DOTmLPF-P Change Recommendations,” memorandum, 3 July 2019.

needs, the newer OIE term presents a rebranding opportunity to continue advancing the needed information capabilities and employment for today's environment. First, the lexical progression from IO to OIE is intended to reflect a broader and more inclusive conceptual shift of information for joint force use in the competition continuum. It is an opportunity to move past the confusion, misunderstanding, and capability disagreements prevalent as IO initially adapted to technology-rich global environments, unifying the diverse IO disciplines and their employment under OIE.

Second, OIE efforts move information considerations earlier in operational planning to support integration and timed orchestration with other joint functions across JFC campaigning, operations, and activities. The move seeks to correct late considerations for IRCs, or "treating 'information operations' as the realm of specialty teams rather than something central to the commander's business."⁵³ It also provides more time for assessment, planning, and approval for IRCs associated with special access programs and requiring high-level authorizations.

Third, OIE framing places a large emphasis on all relevant actors and not just the adversary. Relevant actors are "those individuals, groups, populations, and automated processes and systems that, through their behavior, could substantially impact U.S. national strategy, policy, campaigns, operations, or tactical actions."⁵⁴ The definition reflects continued recognition that various groups and individuals are active domestically and abroad in the information environment. It normalizes information engagement with governments, armed groups, local political and religious leaders, civil society, media, and others.⁵⁵ Information activities affect perceptions, attitudes, and behaviors, and include "informing domestic and international audiences through the release of accurate

⁵³ Mulgund and Kelly, 17.

⁵⁴ U.S. Chairman of the Joint Chiefs of Staff, "Joint Concept for Operations in the Information Environment," 44.

⁵⁵ See JP 3-13, *Information Operations*, Ch 4 "Authorities, Responsibilities, and Legal Considerations" for an introductory discussion. Specific authorities depend on the IRC program and is addressed during detailed planning.

information to put operations in context.”⁵⁶

The multitude of efforts through the JFDD process to address capability gaps and derive solutions for OIE include oversight and collaboration with lead stakeholders. Continued work is needed for OIE to resolve the legacy information operations disparities and facilitate planning and integration of informational power with physical power. In general, OIE offers a broader conceptualization to advance and unify legacy information operations activities for the modern operational environment. However, the evolution is implied instead of stated. The evolution is also impeded without an OIE definition and clarification if OIE centers on affecting behavior or is synonymous with all three information joint function purposes. The joint force’s ability to effectively conduct OIE depends on whether the definitions, concepts, and doctrine clearly convey the meaning of OIE to the wider joint force community.

Advancing OIE through Information Warfare

Absent from current joint doctrine but prevalent in the literature and service efforts is the term "information warfare." In his 2018 book, *Information Warfare*, Daniel Ventre provides a comprehensive literature review of the term across doctrine and other relevant literature. He notes the term “information warfare” disappeared from doctrine between 2009-2015 as “information operations” replaced it, but the concept remains relevant and prevalent for military purposes through theory, concepts, and analysis.⁵⁷

The term “warfare” is also not defined in the current *DoD Dictionary*, although the word is found 173 times in the document in conjunction with other terms such as “electromagnetic warfare,” “undersea warfare,” “land warfare,” “unconventional warfare,” and levels of “warfare,” amongst others.⁵⁸ The 2017 JP 1, *Doctrine for the Armed Forces of the United States*, defines warfare as "the mechanism, method, or

⁵⁶ Mulgund and Kelly, 17.

⁵⁷ Daniel Ventre, *Information Warfare* (Hoboken: John Wiley & Sons, Inc., 2016), 9 & 200.

⁵⁸ DoD Dictionary, 52, 77, 40, 223. Additional examples include navigation warfare, mine warfare, chemical warfare, and surface warfare. Strategic level of warfare, operational level of warfare, and tactical level of warfare are also defined.

modality of armed conflict against an enemy. It is ‘the how’ of waging war. Warfare continues to change and be transformed by society, diplomacy, politics, and technology.”⁵⁹ Given the transformation associated with the competition continuum, one assumes that warfare descriptions will be updated in future doctrine revisions. Regardless, information is a clear and persistent “how” for joint force operations in the competition continuum. Why doctrine refrains from a formal acknowledgement of information warfare is unknown, especially given warfare associations are common practice for military functional communities.

At the same time information warfare started disappearing from joint doctrine, it gained momentum as a descriptor for how the services organize, train, and equip (OT&E) to conduct information in operations. In 2009, the Navy established an information dominance community under the leadership of the Deputy Chief of Naval Operations for Information Dominance/Director of Naval Intelligence. The Navy grouped together all intelligence, cryptology, information systems, and oceanography specialties. The Navy later replaced “information dominance” with “information warfare” when it established information warfare officers and continues other efforts using “information warfare.”⁶⁰

In 2015, the Commandant of the Marine Corps established an Information Warfare Task Force, subsequently establishing a new Deputy Commandant for Information and Marine Expeditionary Force Information Groups (MIGs) in 2017.⁶¹ The Deputy Commandant for Information maintains responsibility for aligning and integrating the Marine Corps’ “information-related capabilities by developing and supervising plans, policies, and guidance for all information environment operations.”⁶²

⁵⁹ U.S. Joint Chiefs of Staff, "Joint Publication 1: Doctrine for the Armed Forces of the United States. Incorporating Change 1, July 12, 2017," I-4.

⁶⁰ Jeffrey E. Trussler, “Maritime Security Dialogue – Information Warfare: From a Supporting Role to a Leading Role,” Center for Strategic and International Studies, (online lecture, November 13, 2020).

⁶¹ Mark Pomerleau, “Why the Marine Corps needed a new deputy commandant,” C4ISRNet, December 5, 2017.

⁶² “Deputy Commandants, HQMC,” U.S. Marine Corps Official Website.

The MIGs coordinate, integrate, and employ capabilities for OIE, including consolidated electromagnetic, cyberspace, information, and influence activities.⁶³ The Deputy Commandant for Information originally refrained from formal or informal use of the term “information warfare” to ensure the Marine's OIE conceptualization did not overlook strategic communications and inform activities. Now she describes the units as “the focal points for all [Marine] information warfare capabilities.”⁶⁴

In 2019, the Air Force designated 16th Air Force (Air Forces Cyber) as an information warfare numbered air force. Additionally, it established information warfare as an Air Force-wide developmental community and competitive promotion category. The community includes cyber operations, intelligence, operations research, weather, special investigation, information operations, and public affairs officer specialties.⁶⁵ In a summer 2020 article, “16th Air Force and Convergence for the Information War,” the Commander of 16 AF (AFCYBER) outlined responsibilities for his command, reinforcing the operational art, authorities, access, and command and control needed to globally synchronize cyberspace, ISR, electromagnetic warfare, IO forces, and IO functions.⁶⁶ Also in the summer of 2020, the Commander of U.S. Army Cyber Command (ARCYBER) highlighted in his article, “Enabling the Army in an Era of Information Warfare,” that information warfare is increasingly used as a term to address cyber, electromagnetic, and informational activities, and the “Army is currently evaluating whether Operations in the Information Environment, Information Warfare, or some other concept should replace Information Operations to describe an expanded Army mission in the Information Environment.”⁶⁷ Furthermore, the Army is considering potentially

⁶³ MAGTF Operations In the Information Environment, August 2019.

⁶⁴ Pomerleau, “Why the Marine Corps needed a new deputy commandant.”

⁶⁵ “Air Force formalizes officer developmental categories, effective March O-5 board,” Secretary of the Air Force Public Affairs, October 21, 2019.

⁶⁶ Timothy D. Haugh, Nicholas J. Hall, and Eugene H. Fan “16th Air Force and Convergence for the Information War.” *Cyber Defense Review* 5 no. 2 (Summer 2020), 29.

⁶⁷ Stephen G. Fogarty and Bryan N. Sparling “Enabling the Army in an Era of Information Warfare.” *Cyber Defense Review* 5 no. 2 (Summer 2020), 18.

renaming the command “to more accurately reflect the full spectrum of its mission portfolio” given responsibility for informational activities outside of just cyber operations.⁶⁸

In addition to organizational changes that instill information warfare for OIE-related capabilities, several services started introducing formal information warfare definitions in 2019 and 2020. The Air Force defined information warfare in support of its efforts to advance information in operations and joint all domain command and control. *The Department of the Air Force Role in Joint All-Domains Operations* doctrine defines information warfare as “the employment of military capabilities in and through the information environment to deliberately affect adversary human and system behavior and to preserve friendly freedom of action during competition, cooperation, and armed conflict.”⁶⁹ Furthermore, the Air Force Warfare Center and 16 AF (AFCYBER) find information warfare helpful in describing persistent actions, introducing “information warfare convergence” as “the integration of capabilities that leverage access to data across separate functions in a way that both improves the effectiveness of each functional capability and creates new information warfare outcomes.”⁷⁰ The 16 AF (AFCYBER) definition accompanies the organization, training, and equipping changes that group diverse disciplines, to move past legacy IO concerns, and impart the needed synchronization to achieve JFC objectives and effects. It also credits *The U.S. Army in Multi-Domain Operations (MDO) 2028* capstone concept for supporting the convergence conceptualization.⁷¹

⁶⁸ Fogarty and Sparling, 18.

⁶⁹ Department of the Air Force, United States Air Force Doctrine Annex 3-99, “Department of the Air Force Role in Joint All-Domain Operations,” June 2020, 11.

⁷⁰ Haugh, Hall and Fan, 17 and George M. Reynolds “Achieving Convergence in the Information Environment: Revising the Air Component Structure.” *Air and Space Power Journal* 34 no. 4 (Winter 2020), 6.

⁷¹ The Army MDO concept identifies convergence as one of three tenets of multidomain operations, defining convergence as “rapid and continuous integration of capabilities in all domains, the electromagnetic spectrum [sic], and information environment that optimizes effects to overmatch the enemy through cross-domain synergy and multiple forms of attack all enabled by mission command and disciplined initiative.”

Headquarters Army currently refrains from formally using information warfare to describe service activities, but the term is used at the service component level. *The U.S. Army in Multi-Domain Operations (MDO) 2028* capstone concept was released in 2018 and uses “information warfare” forty-four times to describe adversary action. However, the document repeatedly delineates that similar Army actions against adversaries are not information warfare; they are information environment operations (IEO).⁷² The concept further describes IEO as a needed evolution of information operations that “synchronizes information-related capabilities (IRC), in concert with operations, to create effects in and through the information space . . . IEO must be fully integrated into the planning and execution of the joint targeting process.”⁷³ At the service component level, ARCYBER defines information warfare as “the converged employment of Cyber Operations, Electronic Warfare, and Information Operations forces, and the capabilities that support Army and Joint operations.”⁷⁴

Although not in joint doctrine, “information warfare” is prevalently used to describe service OT&E efforts to advance information in operations. Even though the Air Force contrasts with the Army at the departmental level in its willingness to use “information warfare” to describe its own military activities, the four services are very similar in their efforts to group similar functional communities and capabilities to deliver integrated information and combined effects for the JFC.⁷⁵ The varied use of IO, OIE, IEO, and information warfare reflect the disparate joint and service efforts to affect behavior and leverage information. Varied definitions are not surprising given joint doctrine has yet to codify the needed taxonomy, relationships, and understanding to unify

⁷² Department of the Army, “The US Army in Multi-Domain Operations: 2028. TRADOC Pamphlet 525-3-1,” (Fort Eustis, VA, December 2018), vi & 10. IEO is synonymous with Operations in the Information Environment.

⁷³ Ibid., C-9.

⁷⁴ Fogarty and Sparling, 20.

⁷⁵ At the time of this research United States Space Force exists as the fifth service and is a provider of some information-related capabilities, however unique service information doctrine does not exist at this time.

efforts for information in operations.

Chapter Conclusion

The introduction of OIE rightly reflects current operational environment needs for persistent engagement, incorporating information planning earlier into joint operations, normalizing relevant actors as more than just adversaries, and more. A review of joint and service OT&E efforts reveals deliberate action to advance information capabilities and potentially unify the diverse disciplines involved with delivering information power. However, the efforts fail to fully rectify legacy concerns as the joint force has transitioned between information warfare, IO, and now OIE.

Although the joint force acknowledges new terms and lexicon are needed for the current environment, the introduction of OIE without a definition and clarifying its relationship to current practices adds to confusion instead of resolving it. Despite purposeful efforts to formally replace information warfare with IO, the term information warfare persists and continues to be even more institutionalized by services since information became a joint function and as OIE was introduced. Neither term is likely to disappear even as OIE becomes the predominant conceptualization, highlighting a necessary interrelationship for OIE, IO, and information warfare in support of the information joint function. The JFC's ability to understand the impact of information and leverage it to affect relevant actor behavior is also dependent on the planners' and supporting forces' shared understanding of what that means. Meaning is a significant element of information in operations, including the ability to affect behavior internally and externally. The meaning, concept associations, and application for OIE are not well defined for the joint force perpetuating difficulties applying information as a joint function.

Chapter 5: Information and Decisions

Information generates decisions and decisions generate information. Joint force operations require “timely, accurate, and relevant information necessary for JFC decision-making.”¹ JP 3-0’s third purpose for the information joint function, support to human and automated decision-making, is intended to (1) facilitate shared understanding across the joint force, and (2) protect friendly information, information networks, and systems.² As described, facilitating shared understanding occurs through internal and external staff processes and technologies that enable collaboration, knowledge sharing, and information management.³ Protecting information and systems reinforces “the requirement to assure the flow of information important to the joint force.”⁴ Review of the doctrine and efforts associated with supporting human and automated decision-making reveal a continued trend of piecemealing associations and delineations instead of supporting JFC decisions by comprehensively associating information’s integration with other joint functions.

The initial explanations for how information supports decision-making positively acknowledge management and collaboration activities while also highlighting that decisions are made by humans and automated systems. Internal and external collaboration, knowledge sharing, and information management are select information and communications activities transferred from JP 3-13, *Information Operations* into JP 3-0, *Operations*. The activities are appropriately identified and reinforced as necessary capabilities for shared understanding across dispersed and cross-agency environments. They are enabled by JFC staff processes and collaborative technology. Furthermore, specifying human and automated decision-making is a constructive acknowledgment emphasizing current and future use of artificial intelligence and machine learning

¹ U.S. Joint Chiefs of Staff, “Joint Publication 3-0: Joint Operations,” III-19.

² Ibid., III-19-20.

³ Ibid., III-20-21.

⁴ Ibid., III-21-22.

technologies. For example, the *Joint Concept for Operations in the Information Environment* (JCOIE) acknowledges advanced automated social and technological systems will develop understanding and approaches for the JFC.⁵ There are immense technical and procedural challenges to enable this information exchange, but expounding decision-making by stating “human and automated” helps planners, providers, and practitioners recognize both instead of inadvertently overlooking automated systems.

Relegating information’s joint function purpose for supporting decision-making to management and collaboration activities, however, fails to fully address information’s support to human and automated decision-making in two areas. First, it artificially bifurcates command and control’s inherent dependency on information. JP 3-0 attempts to delineate the decision-making responsibilities between command and control and information, describing that “building shared understanding is an element of C2 and focuses on purpose (i.e., the commander’s objective), [but] facilitating shared understanding is concerned with process (i.e., the methods).”⁶ The nuanced building-versus-facilitating and purpose-versus-process delineation is unnecessary, even when considering information-related capabilities (IRCs) such as commanders communication synchronization. While each IRC requires specific practices, the bifurcation with command and control overlooks the fact that sharing and deciding are inherently intertwined in all stages of planning and operations. The doctrinal definition for information as “data in context to inform or provide meaning for action” is ignored.⁷ The meshed nature of information and decision-making is especially true under integrated joint force campaigning and new command and control initiatives. For example, DoD efforts for Joint All Domain Command and Control (JADC2) will increasingly rely on information and algorithms connecting sensors across all domains and services to support

⁵ U.S. Chairman of the Joint Chiefs of Staff, “Joint Concept for Operations in the Information Environment,” 34.

⁶ U.S. Joint Chiefs of Staff, “Joint Publication 3-0: Joint Operations,” III-19.

⁷ Chairman of the Joint Chiefs of Staff, “Joint Publication 3-13: Information Operations,” I-3.

military-related decisions.⁸ Service programs and technological efforts supporting JADC2 include the Air Forces' Advanced Battle Management System, the Army's Project Convergence, and the Navy and Marine's Distributed Maritime Operations Concept.⁹ These efforts reflect information as a lynchpin for knowing more and deciding quickly in the operational environment.

Furthermore, all joint functions have a greater reliance on information than just collaborative staff processes and network protection. Joint functions all depend on information including the physical, cognitive, and informational domains of the information environment. For example, in a 2018 article titled “Practical Implications of Information as a Joint Function,” the Director of the Joint Information Operations Warfare Center illustrates the information joint function’s direct integration with the command and control, fires, intelligence, movement and maneuver, protection, and sustainment functions.¹⁰ The Air Force’s *Command and Control of Operations in the Information Environment: Leading with Information in Operational Planning, Execution, and Assessment* visually depicts a similar idea to support component-level application for joint force requirements.¹¹ Meeting the challenges of transregional, all-domain, and multifunctional threats requires the convergence of information and capabilities across all services and joint functions. While the applicability of the information joint function to other joint functions is illustrated in military journals and service documents, comprehensive interrelatedness is absent in JP 3-0 or current joint concepts and doctrine.

Chapter Conclusion

All joint functions require information, understanding, and decisions. The JP 3-0

⁸ U.S. Congressional Research Service, *Joint All Domain Command and Control*, IF11493 (Washington, D.C., October 2020), 1.

⁹ *Ibid.*, 2.

¹⁰ Gregory C. Radabaugh, “The Practical Implications of Information as a Joint Function.” *Joint Forces Quarterly*, 89 (Second Quarter 2018): 16-17.

¹¹ Department of the Air Force, “Command and Control of Operations in the Information Environment: Leading with Information in Operational Planning, Execution, and Assessment,” draft, (Washington, D.C., December 2020), 11.

explanations that narrow the support human and automated decision-making purpose to management and collaboration miss an opportunity to truly reinforce and clarify information's importance as a joint function across all joint functions. The doctrinal conventions and intertextuality that could bolster joint function interrelatedness for information in operations by connecting “matters of function, meaning, interpretation, and significance” are lacking.¹² Instead, the current JP 3-0 explanations across all three purposes selectively refer, or require the planners to infer, the application and inclusion of other joint functions. There is no consolidated crosswalk for information’s integration across all joint functions. By drawing too heavily on subordinate doctrine and prior definitions and activities, JP 3-0’s initial explanations for the information joint function squander the opportunity to provide shared understanding on information’s full support to human and automated decision-making and integration across all joint functions.

¹² Ellen Barton, “Linguistic Discourse Analysis: How the Language in Texts Work,” in *What Writing Does and How it Does it*, ed. Charles Bazerman, and Paul Prior (New Jersey: Lawrence Erlbaum, 2004), 66.

Chapter 6: Conclusion

Information is essential in an environment of complex adaptive systems necessitating synchronization across multiple services, agencies, and domains. The information joint function frames three purposes to support the Joint Force Commander (JFC): understand, affect behavior, and support decision-making. Doing so requires diverse information capabilities deliberately integrated together and with other joint functions. However, the nascent conceptualizations and labyrinthine discussions of how and when information relates to other joint functions is conceptually incomplete for information *in* operations. Joint force efforts to resolve the planner's paradox with new understanding and capabilities simultaneously contribute to the planner's paradox through unclear additions and delayed codification. Achievement of the full potential of the newest joint function is further hampered by the variety of ways in which information and information capabilities are defined and applied within the services and functional communities. Definitions matter because they drive shared understanding for development and employment. Continued lexical misunderstandings, doctrinal strife, and divergent approaches will impede planners, practitioners, and providers' ability to employ information power for joint force effects.

The research assessed the initial framing of information as a joint function, what information and information-related requirements are needed for the current environment, how paradigms and definitions affect joint force knowledge and conceptualization, and current joint and service efforts to advance information in operations. In doing so, it revealed four main insights with associated implications and recommendations.

Insight #1 Informed Development: Doctrine, concept, and capability advances reflect a large consensus that earlier integration of information into planning and operations is imperative to address transregional, all-domain, and multi-functional threats in the competition continuum. There are significant joint staff and service efforts to advance information in operations. Joint doctrine, joint doctrine notes, and joint concepts are

primary means to inform the joint force on fundamental principles and overarching guidance. Even though service leaders speak and publish ideas towards the problem set, the joint force must deliberately and repeatedly inform joint audiences on efforts to advance information and OIE. Deliberate and repeated efforts to inform joint audiences help offset variance in individual knowledge of institutional doctrine, processes, and current initiatives. Joint processes and documents can unify against disparate tactical and service experiences but only if one is informed of the joint intent, resources, and efforts. The dissemination is especially imperative as doctrine, strategy, and concepts may vary and doctrinal codification often takes years. For the joint force to lead with information, it must rectify the four-year lag of doctrinal updates since information became a joint function.

Insight #2 Integrating Purpose and Joint Functions: Understanding, affecting behavior, and supporting decisions are an effective initial framing for information purposes but, as written, JP 3-0 does not fully convey how to execute information as a joint function in easily referenced constructs and associations. The supporting content and activities are largely recycled from various subordinate joint doctrine without new analysis, explanation, or relational clarity. Selected correlations for information's relationship to other joint functions provide an emerging conceptualization for the information joint function but clear doctrinal insight and expectations for information's interrelatedness with all joint functions is incomplete.

Information's integration with other joint functions should be clearly and painstakingly explained for application and employment by planners, providers, and practitioners to avoid disparate interpretations and rationalizations. Clear association and enforced integration with other joint functions can be supported with explanations and visuals as presented in "Practical Implications of Information as a Joint Function" and the Air Force's *Command and Control of Operations in the Information Environment: Leading with Information in Operational Planning, Execution, and Assessment*. For

example, “understand information and the operational environment” does not replace the intelligence function’s JIPOE process. Instead, it reinforces and amplifies the importance of thoroughly understanding the information environment and its actors as part of understanding the operational environment. Clarified terminology enables the application of information power and leveraging information to affect behavior. Leveraging information and applying information power is inherent in campaigning and occurs through the established joint fires function processes where IRCs are synchronized with other capabilities to deliver effects. Protecting friendly information, information networks, and systems is inherent in the protection joint function, as are military deception and operational security (OPSEC) IRCs that support movement and maneuver. Effective command and control does not exist without information to feed understanding, planning, and decisions. The convergence is underpinned by information and the information environment’s connectivity, content, and cognition that directly support the JFC’s ability to understand, affect behavior, and decide.

Four additional recommendations for JP 3-0 will clarify the purposes for information as a joint function and assist additional doctrinal development:

1. Instead of describing the information joint function consists of three “types of activities” that further consist of activities, JP 3-0 should describe “the role of information as a joint function entails three purposes” and provide new analysis and explanation to support current employment.
2. JP 3-0 should clarify the initial joint function purpose as “understand the information environment” instead of “understand the role of information in operations.” This change seizes an opportunity to reinforce the importance of information environment awareness and its existence as part of the operational environment. It also establishes baseline understanding and correlation to the new paradigm surrounding OIE.
3. JP 3-0 should expand the second purpose of “leveraging information to affect

behavior” by establishing a defined relationship with OIE, IO, and information warfare.

4. JP 3-0 should maintain the “support human and automated decision-making” emphasis on collaboration, knowledge sharing, and information management while also explicitly conveying how the information joint function integrates with all other joint functions. Such an approach would better depict the interrelatedness and associations with other joint functions instead of duplicating or selectively referring to other joint function activities in the various descriptions. Moreover, it further instills the importance of information and how it transcends all joint functions in the same manner as command and control and intelligence.

Insight #3 Distilled Definitions: New definitions and descriptions related to information need further evaluation before doctrinal codification. As new paradigms and terms are adopted, they can generate large variance in interpretations and applications across the individuals and organizations involved, especially in the joint environment where not everyone understands the language to mean the same thing or may not be aware of new doctrine or operating concepts. The following terms warrant additional considerations before doctrinal codification or deletion:

1. Informational Power. The application aligns to other associations of power but the definition is canted towards leveraging information to affect behaviors. As additional doctrine and concepts are developed, consideration should be given to whether informational power and information advantage definitions should encompass the entirety of the three information in operations purposes or just affecting behavior. Canting the definition towards affecting behavior inadvertently excludes all elements of informational power and IRCs.
2. Information-related capabilities (IRCs). IRCs are a highly utilized term across the services and a well-understood grouping of capabilities. Initial information joint function framing relating the capabilities directly to JFC operations,

activities, and investments (OAIs) used in campaigning is valuable. However, the lack of the term IRC in the JCOIE, JP 3-0, and the draft updates to the JP 3-13 replacement represent intent to remove IRC. Given prevalence in practice, doctrine, and policy, it is better to relate IRCs as means for OAIs in campaigning instead of attempting to eliminate the term.

3. Information Environment. Proposed updates to the information environment definition and conceptualization introduce several concerns. As discussed in Chapter 4, they add to complexity and dissension by fundamentally changing other dependencies across joint doctrine, e.g., cyber domain. Additionally, they are significantly tailored towards advanced knowledge of affecting behavior instead of general understanding and relatability across wider joint audiences. Alternate models, such as the 3C model, support common understanding while more complex assessment models, such as those evaluated with the Strategic Multilayer Assessment for Information in Joint Operations, can be used by specialized practitioners for more detailed planning and execution.

4. Operations in the Information Environment. OIE must be defined for the joint force to continue advancing information in operations. The term's introduction does not specify if OIE is synonymous with influencing behaviors in the same manner as legacy information operations or if it more broadly covers the new role of information in operations that leverages all information-related capabilities to support the JFC's ability to understand, affect, and decide. A semi-formal DoD definition is only found in the JROC 068-19 *OIE DOTmLPF-P Change Recommendations* memorandum. However, that definition's word choice narrows OIE and information power towards the affecting behavior purpose of the information joint function and excludes the function's other purposes. Moreover, OIE capabilities expressed in the JROC memorandum encompass a wide variety of information capabilities integration, not just the ability to affect relevant actors.

Insight #4 Realizing OIE: If OIE is the prevalent DoD and joint force conceptualization, what it is and how it associates to information capabilities and other joint functions must be better communicated and understood. In addition to defining OIE, the joint force must clarify the relationship between OIE, IO, and information warfare. IO and information warfare are widespread terms unlikely to be replaced, especially given information warfare's prevalence in service OT&E efforts to consolidate forces responsible for conducting information in operations. Service OT&E efforts are relatively similar and address many legacy IO concerns by unifying diverse OIE-related disciplines to better information capability integration for joint force effects. Given historical dissension within information operations communities and confused understanding across the broader force, there is an opportunity for OIE to own the narrative for the relationships with IO and information warfare instead of competing with them.

JFCs and planners require integrated information capabilities and concepts *now* for information power and relative advantage in the competition continuum. If the joint force is to successfully leverage information power to inform and influence external relevant actors, it must also hone its efforts to better inform operational artists and practitioners across the joint force as essential target audiences. Joint campaigning and synchronizing forces in time and space absolutely requires knowing more, affecting more, and deciding more. An opportunity exists now to create clarity amidst the complexity of operations through understanding and advancement of the information joint function. As joint and individual service actions gain momentum there are many resourcing, training, and technical implementation challenges impeding successful outcomes. However, to achieve the full paradigm shift associated with information as a joint function, the joint force must stop talking past each other and agree on the basic taxonomy, relationships, principles, and guidance expected of joint doctrine. Jointness and effective operations in the competition continuum depend on an informed information joint function.

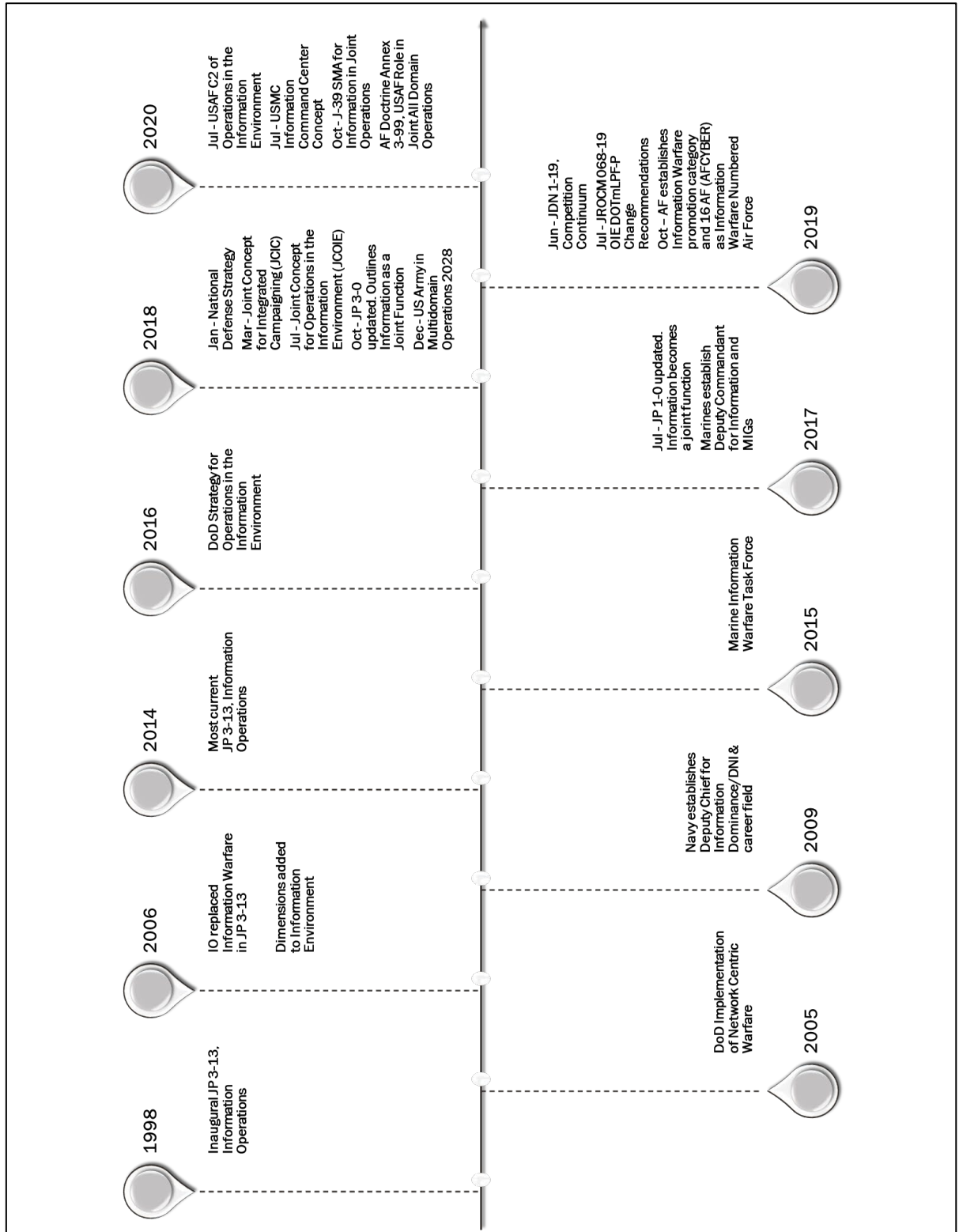
Appendix A – Table of Definitions

Term	Definition	Source	Source Type
Air power	The ability to project military power or influence through the control and exploitation of air, space, and cyberspace to achieve strategic, operational, or tactical objectives.	Department of the Air Force, “United States Air Force Doctrine Volume 1 - Basic Doctrine”	Service Doctrine (AF)
Fires	The use of weapon systems or other actions to create specific lethal or nonlethal effects on a target. Fires are normally synchronized and integrated to achieve synergistic results. Fires can be delivered by air, land, maritime, cyberspace, space, or special operations forces. Employing fires in conjunction with other activities, such as information-related activities, to create desired effects is a particularly important factor in maintaining or reestablishing a safe and secure environment.	JP 3-9	Joint Doctrine
Information	1. Facts, data, or instructions in any medium or form. 2. The meaning that a human assigns to data by means of the known conventions used in their representation.	JP 3-13	Joint Doctrine
Information	Data in context to inform or provide meaning for action.	JP 3-13	Joint Doctrine
Information Environment	The aggregate of individuals, organizations, and systems that collect, process, disseminate, or act on information.	JP 3-13 and DoD Dictionary	Joint Doctrine
Information Environment	Comprised of and [aggregating] numerous social, cultural, cognitive, technical, and physical attributes that act upon and impact knowledge,	U.S. Chairman of the Joint Chiefs of Staff, “Joint Concept for Operations in the Information Environment”	Joint Concept

	understanding, beliefs, world views, and, ultimately, actions of an individual, group, system, community, or organization. The IE also includes technical systems and their use of data. The IE directly affects and transcends all OE.		
Information Environment Operations	Synchronizes information-related capabilities (IRC), in concert with operations, to create effects in and through the information space.	Department of the Army, “The US Army in Multi-Domain Operations: 2028. TRADOC Pamphlet 525-3-1”	Service Concept (Army)
Informational Power	The ability to leverage information to shape the perceptions, attitudes, and other elements that drive desired behaviors and the course of events.	U.S. Joint Chiefs of Staff, “Joint Concept for Operations in the Information Environment”	Joint Concept
Information Related Capability (IRC)	A tool, technique, or activity employed within a dimension of the information environment that can be used to create effects and operationally desirable conditions	JP 3-13 and DoD Dictionary	Joint Doctrine
Information Warfare	The converged employment of Cyber Operations, Electronic Warfare, and Information Operations forces, and the capabilities that support Army and Joint operations.	Stephen G. Fogarty and Bryan N. Sparling “Enabling the Army in an Era of Information Warfare.” Cyber Defense Review 5 no. 2 (Summer 2020), 18.	Literature/Service Component Commander (Army)
Information Warfare	The employment of military capabilities in and through the information environment to deliberately affect adversary human and system behavior and to preserve friendly freedom of action during competition, cooperation, and armed conflict.	Department of the Air Force, United States Air Force Doctrine Annex 3-99, “Department of the Air Force Role in Joint All-Domain Operations”	Service Doctrine (Air Force)
Information Warfare Convergence	The integration of capabilities that leverage access to data across separate functions in a way	Timothy D. Haugh, Nicholas J. Hall, and Eugene H. Fan “16th Air Force and Convergence	Literature/Service Component Commander (Air Force)

	that both improves the effectiveness of each functional capability and creates new information warfare outcomes.	for the Information War.” Cyber Defense Review 5 no. 2 (Summer 2020), 29.	
Joint Function	Related capabilities and activities placed into seven basic groups of command and control, information, intelligence, fires, movement and maneuver, protection, and sustainment to help joint force commanders synchronize, integrate, and direct joint operations.	JP 3-0 and DoD Dictionary	Joint Doctrine
Operations in the Information Environment (OIE)	Those activities that generate, apply, and alter information to change or maintain the perceptions, attitudes, and other elements that drive behaviors of relevant actors and the course of events	Vice Chairman of the Joint Chiefs of Staff, “JROCM 068-19 – Operations in the Information Environment DOTmLPF-P Change Recommendations”	JROC Memorandum
Operations in the Information Environment (OIE)	The sequence of actions with the common purpose of affecting the perceptions, attitudes, and decision-making of relevant actors. This is the new way to talk about the tasks, activities, and actions the joint force undertakes to set conditions and seek advantage in and through the information environment.	Christopher Paul, “Is It Time to Abandon the Term Information Operations?” The Strategy Bridge, accessed November, 2020	Literature
Warfare	The mechanism, method, or modality of armed conflict against an enemy	JP 1	Joint Doctrine

Appendix B – Information *in* Operations Event Timeline



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Vita

Lieutenant Colonel Stacie Voorhees is a United States Air Force Cyberspace Operations Officer. She commissioned in 2004 after graduating from the U.S. Air Force Academy with a Bachelors of Science in Social Sciences and Spanish minor. Additionally, she holds a Masters of Science Degree in Information Engineering and Systems Management from Southern Methodist University, is a Certified Information Systems Manager, and is a graduate of the United States Army Command and General Staff College. Colonel Voorhees is a two-time squadron commander, most recently responsible for tactical command and control, enterprise situational awareness, and strategic communications for Air Force Information Network operations. This included the synchronization and integration of operations and activities across multiple cyber weapon systems, agencies, operations centers, and bases to assure global Air Force missions through persistent network operations, enterprise services, and defensive cyber operations. Her career experience also includes multiple flight commands, Executive Officer, Squadron Director of Operations, Tactical Communications, Air Operations Center Command and Control Planner, Headquarters 12th Air Force (Air Forces Southern) Commander's Action Group, Policy and Resources Division Chief, and Headquarters Knowledge Management Officer. Colonel Voorhees deployed in 2006 to Afghanistan on the International Security Assistance Force CJ6 Staff, and to Iraq in 2008 as a Planning and Resources Flight Commander. In 2014 she deployed to Honduras as a remote Detachment Commander supporting United States Government and coalition counterdrug operations.