Joint Concept for Operating in the Information Environment (JCOIE)

25 July 2018

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FOREWORD

In recognition of the increasing impact of activities in the information environment, the Chairman of the Joint Chiefs of Staff felt the role of information was so critical that he issued an out-of-cycle change to Joint Publication 1, *Doctrine of the Armed Forces of the United States*, introducing "Information" as the seventh Joint Function. Independent of the form of warfare, the *Joint Concept for Operating in the Information Environment* (JCOIE) addresses the role of information and focuses on how information can change or maintain the drivers of behavior.

JCOIE recognizes that individuals and groups today have access to more information than entire governments once possessed. They can swiftly organize and act on what they learn, sometimes leading to violent change. When applied to military systems, this diffusion of technology challenges competitive advantages long held by the United States. Our competitors and adversaries are using technology to offset or diminish the physical overmatch of the broad range of U.S. lethal capabilities.

To achieve enduring strategic success, our Joint Force must develop the necessary mindset—individually, as a whole, and as part of the interagency—to leverage information and the inherent informational aspects of military activities to gain and maintain an information advantage. We will develop the necessary mindset through the institutionalizing and operationalizing the application of integrated physical and informational power. To achieve desired influence, the Joint Force must begin from a mindset based on a greater understanding of the environment, relevant actors, and how the Joint Force applies information.

Information is changing the character of modern warfare. In order to gain and maintain an information advantage, the Joint Force must fully implement this concept, written by stakeholders and Service representatives, to achieve success in the security environment during times of cooperation, competition, and armed conflict.

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If these obstacles, along with others suggested by a historical analysis of the implementation of a new form of warfare, are indeed alive and well today, then there may be a good chance that the substantive issues of information warfare will not be addressed until the United States is actually engaged in an information war.

Richard Jensen
1997

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EXECUTIVE SUMMARY

The *Joint Concept for Operating in the Information Environment* (JCOIE) describes how the Joint Force[1] will build information into operational art to design operations that deliberately leverage information and the informational aspects of military activities to achieve enduring strategic outcomes. The changing role of information has allowed state and non-state actors to influence global audiences, rapidly gain momentum, and advance their objectives. Adaptive state and non-state actors are proficient at using information to gain an advantage over the Joint Force. In order to compete in the information environment (IE), JCOIE aims to institutionalize and operationalize the Joint Force's approach to information. This requires an understanding of information, the informational aspects of military activities, and informational power.

Security Environment. The security environment is the set of global conditions, circumstances, and influences that will affect the employment of the U.S. military and includes the sum of all operational environments (OE). The Joint Force will face two interrelated challenges in the future security environment. The first is contested norms in which powerful actors, dissatisfied with the status quo, will capitalize on changes in communication and changes in socio-cultural contexts to contest norms governing international behavior. The second challenge is persistent disorder in which weak states are incapable of maintaining domestic order in the face of crisis. Information pervades the security environment, enabling people to see more, share more, create more, and organize faster than ever before.[2] Information technology has significantly enhanced human interaction around the globe and elevated the importance of information as an instrument of power wielded by individuals and societies in politics, economics, and warfare. Advances in information technology have significantly changed the generation of, transmission of, reception of, and reaction to information. These advances have increased the speed and range of information, diffused power[3] over information, and shifted socio-cultural norms. The interplay between these three impacts provides our competitors and adversaries additional opportunities to offset the diminishing physical overmatch of the world's preeminent warfighting force.

The Military Challenge. How will the Joint Force integrate physical and informational power to change or maintain the perceptions, attitudes, and

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[1] JCOIE uses "the Joint Force" to refer to a formal combination of the Joint Staff, Combatant Commands, subordinate joint forces, and supporting joint organizations.

[2] Joint Chiefs of Staff. *National Military Strategy of the United States 2015*. June 2015. Web.
http://www.jcs.mil/Portals/36/Documents/Publications/2015_National_Military_Strategy.pdf?

[3] Nye, Joseph S. 2014. The Information Revolution and Soft Power. *Current History* 113(759): 19-22. Web.
http://www.currenthistory.com/Article.php?

other elements that drive desired behaviors of relevant actors in an increasingly pervasive and connected IE to produce enduring strategic outcomes?

The Central Idea. To address this challenge and achieve enduring strategic outcomes, the Joint Force must build information into operational art to design operations that deliberately leverage the inherent informational aspects of military activities.[4]

To integrate physical and informational power through the deliberate leveraging of military activities, the Joint Force must:

1. Understand information, the informational aspects of military activities, and informational power.

This concept postulates that the Joint Force must understand how to manipulate and leverage information and the inherent informational aspects of military activities to send a deliberate message. Every Joint Force action, written or spoken word, and displayed or relayed image has informational aspects that communicate a message or intent. Informational aspects are the features and details of activities that an observer interprets and uses to assign meaning. JCOIE describes informational power as the ability to leverage information to shape perceptions, attitudes, and other elements that drive desired behavior and the course of events. The Joint Force applies informational power to achieve three ends:

- Change or maintain the observations, perceptions, attitudes, and other elements that drive desired behaviors of relevant actors.

- Protect and ensure the observations, perceptions, attitudes, decisions, and behaviors of the Joint Force, its allies, and its partners.

- Acquire, process, distribute, and employ data to enhance combat power.

2. Institutionalize the integration of physical and informational power.

To achieve success in the future security environment, the Joint Force must shift how it thinks about information from an afterthought and the sole purview of information professionals to a foundational consideration for all military activities. The Joint force must design all activities and operations from the outset to account for the use and impact of information on relevant

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[4] Note: The JCOIE does not create new authorities; rather, it provides a conceptual framework by which information may be integrated into operational art to achieve strategic gains. The proponency of the JCOIE is restrained by the relevant laws, authorities, and policies in effect at the time of the proposed operation.

actors. Instead of relying primarily on physical power as a form of destructive or disruptive force, the Joint Force must normalize the integration of physical and informational power to capitalize on the constructive and informational aspects of military power.

Institutionalizing a mindset that considers information from the outset requires a common understanding. This common understanding begins with shared situational awareness, a common lexicon, standardization of processes, and establishment of relationships that reduce or eliminate barriers to the integration of physical power and informational power. Defining the Joint Force's objectives in terms of perceptions, attitudes, and other elements that drive desired behaviors, as well as in terms of destroying an adversary's capability or order of battle, will increase the opportunity to establish a common vision, goals, and objectives to achieve mission success.

3. Operationalize the integration of physical and informational power.

To produce enduring strategic outcomes that hinge on perceptions, attitudes, and other elements that drive desired behaviors, the Joint Force must operationalize its application of informational power. A better characterization of the informational, physical, and human aspects of the security environment is required to expose and leverage the interdependencies between them. Because perceptions and attitudes inform behavior, the Joint Force must treat them as "key terrain." Employing various analytical methodologies provides context to changes in the security environment and insight into worldviews that frame the perceptions, attitudes, and other elements that drive desired behaviors of relevant actors. This understanding is necessary to integrate activities capitalizing on opportunities or overcoming obstacles using a whole of government approach to achieve enduring strategic outcomes.

A transregional, multi-domain, and multi-functional approach is necessary to analyze relevant environmental factors that provide opportunities or challenges to achieving desired outcomes. Innovation and the consistent integration of actions and words for each operational situation, assisted by subject matter experts (SME), technology, and multi-functional models, will provide commanders a broader range of options to maximize military power. Effectively leveraging the inherent informational aspects of military activities will enable the Joint Force to drive desired behaviors of relevant actors as well as assist in the destruction of adversary capacity and capabilities.

Required Capabilities. This concept identifies 17 required capabilities to enable the Joint Force to leverage information and the inherent informational aspects of military activities and integrate physical and informational power as envisioned. Adoption of this concept will inform supporting joint and Service

concepts, and guide doctrine, organization, training, materiel, leadership and education, personnel, facilities, and policy solutions. The required capabilities align with many of those identified in Joint Concept for Integrated Campaigning (JCIC), Joint Concept for Human Aspects of Military Operations (JC-HAMO), Joint Concept for Cyberspace, and Joint Concept for Electromagnetic Spectrum Operations.

PROBLEM SPACE	REQUIRED CAPABILITIES
Historic Challenges • Adversaries operating in the changing environment to create political, cultural, social, and military advantages. • The Joint Force's inefficiency in recognizing and capitalizing on the informational aspects of military activities **Emerging Challenges** Future competitors and adversaries will: • Combine new communication strategies and technologies to support their efforts and disrupt U.S. and coalition operations. • Capitalize on changes in communication and changes in socio-cultural contexts to contest norms. **The Military Challenge** How will the Joint Force change or maintain perceptions, attitudes, and other elements that drive desired behaviors of relevant actors in an increasingly pervasive and connected IE to produce enduring strategic outcomes? **SOLUTION SPACE** **Central Idea** The Joint Force must build information into operational art to design operations that deliberately leverage the informational aspects of military activities. **Supporting Ideas** In order to affect the perceptions, attitudes, and other elements that drive desired behaviors of relevant actors through the integration of physical and informational power, the Joint Force must: • Understand information, the informational aspects of military activities, and informational power • Institutionalize the integration of physical and informational power • Operationalize the integration of physical and informational power	**A. Required Capabilities to Characterize and Assess the Informational, Physical, and Human Aspects of the Security Environment. The Joint Force requires the ability to:** **A.1** determine the impact of relevant informational, physical, and human aspects of the security environment on Joint Force objectives. **A.2** understand the perceptions, attitudes, and other elements that drive behaviors that affect JFC's objectives. **A.3** understand how relevant actors are successful in adapting their use of information technology. **A.4** share contextual understanding of the security environment. **A.5** characterize, assess, synthesize, and understand trends of relevant actor activities and their impacts on the IE throughout cooperation, competition, and conflict. **A.6** analyze and estimate relevant change within the IE. **A.7** identify, access, and manage IE subject matter expertise. **A.8** understand internal and other relevant actor bias within the IE. **B. Required Capabilities to Formulate Options that Integrate Physical and Informational Power. The Joint Force requires the ability to:** **B.1** identify, optimize and assess the effectiveness of the full range of options that integrate physical and informational power to produce desired psychological effects. **B.2** employ required forces and capabilities from across the Joint Force to sustain or change perceptions, attitudes, and other elements that drive desired behaviors of relevant actors. **B.3** assess relevant actors' capability and capacity to receive, understand, and respond to Joint Force physical and informational activities. **C. Required Capabilities to Execute and Modify Options. The Joint Force requires the ability to:** **C.1** execute integrated physical and informational activities designed to achieve psychological effects. **C.2** assess and modify informational power with the same level of competency as physical power. **D. Required Capabilities to Institutionalize the Integration of Physical and Informational Power. The Joint Force requires the ability to:** **D.1** change how its individuals, organizations, and units think about and treat information. **D.2** organize, train, equip, and maintain organizations that deliberately leverage information and the informational aspects of military activities. **D.3** integrate operations with interorganizational partners. **D.4** leverage physical and informational power at its discretion to achieve objectives.

Table 1: Joint Concept for Operating in the Information Environment Logic Flow

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1. Introduction

The *Joint Concept for Operating in the Information Environment* (JCOIE) describes how the Joint Force will build information into operational art to design operations that deliberately leverages information and the inherent informational aspects of military activities to achieve enduring strategic outcomes. The changing role of information has allowed state and non-state actors to influence global audiences, rapidly gain momentum, and advance their objectives. Adaptive state and non-state actors are proficient at using information to gain an advantage over the Joint Force.[5] To compete in the IE, JCOIE aims to institutionalize and operationalize the Joint Force's approach to information. This requires an understanding of information, the informational aspects of military activities, and informational power.

The U.S. Government (USG) wields military power, as an instrument of national power, to achieve political ends. Military operations traditionally focus on compelling adversaries through the threat or application of physical power in the form of destructive or disruptive force (combat power)[6] to achieve victory. However, joint forces can also conduct military activities to apply physical power in a constructive or persuasive manner. JCOIE suggests maximizing the efficiency and effectiveness of military power, the Joint Force must move beyond an integrating strategy of individual capabilities to one that deliberately leverages information and the inherent informational aspects of military activities through the integration of physical and informational power.

The JCOIE is part of a family of joint concepts developed to support globally integrated operations.[7] It works in concert with the ideas contained in the JCIC and the JC-HAMO. JCIC acknowledges that the Joint Force is in a constant state of competition and that competition requires the future Joint Force to design campaigns that account for cooperation, competition, and conflict. JC-HAMO focuses on identifying and understanding relevant actors [understanding who is in the fight]. JCOIE focuses on leveraging the inherent informational aspects of military activities to affect the perceptions, attitudes, and other elements that drive desired behaviors through the integration of physical and information power [understanding the fight we face and understanding the impact of our actions on the fight].

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[5] Nye, Joseph S. 2014. The Information Revolution and Soft Power. *Current History* 113(759): 19–22. Web. http://www.currenthistory.com/Article.php?

[6] Dinesman, Michael D. *Generation of Combat Power by Insurgents: An Historical Analysis.* Thesis. School of Advanced Military Studies, 2013. Accessed through Defense Technical Information Center. Web. 11 May 2016. Dinesman's representation of combat power illustrates the utility of information to impact the operating environment.

[7] Globally integrated operations is the fundamental idea in the Capstone Concept for Joint Operations: Joint Force 2020. 10 September 2012. Washington, D.C.

2. Information, Informational Aspects, and the Future Security Environment.

Globally integrated operations is the concept for how the Joint Force should prepare for the future security environment.[8]   The security environment is the set of global conditions, circumstances, and influences that guide the employment of the U.S. military to meet national security challenges.[9] Pervasive throughout the security environment, information is enabling people to see more, share more, create more, and organize faster than ever before. People and populations will continue to be decisive features of the security environment[10] impacting how the Joint Force thinks about campaigning and maneuver.

Globally integrated operations require a Joint Force that is postured to quickly combine capabilities with itself and mission partners across domains, echelons, geographic boundaries, and organizational affiliations. Globally integrated operations take place within a global IE. To operate effectively in this global IE, the Joint Force requires a better model to characterize the shared space between the OE and the IE.

The current model of the IE (Figure 1) focuses on the transmission, processing, and storage of information within three interrelated but distinct dimensions.[11] The original intent of this transmission-centric model of the IE was to help the Joint Force visualize how to share
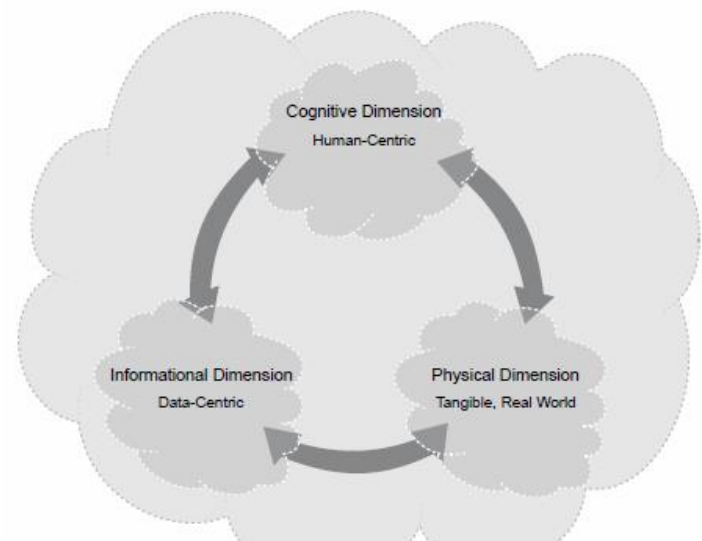

Figure 1: The Information Environment

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[8] *Capstone Concept for Joint Operations: Joint Force 2020*. 10 September 2012. Washington, D.C.

[9] U.S. Army Training and Doctrine Command. "*UPDATED* TRADOC G-2 Call for Papers: Strategic Security Environment 2050." *Small Wars Journal*, 2 June 2016.

[10] The USA, USMC, USSOCOM White Paper, dated 2013 named "Strategic Landpower: Winning the Clash of Wills" stated "This nation takes action in the international arena aimed at influencing human activity and the environments in which that activity occurs. It could not be otherwise, as all institutions – states, corporations, NGOs, etc. – are populated, controlled, and directed by people. Influencing these people – be they heads of state, tribal elders, militaries and their leaders, or even an entire population – remains essential to securing U.S. interests. All elements of national power have an important role in these interactions with other nations and peoples."

[11] Joint Publication 3-13, *Information Operations*. Defense Technical Informational Center, 27 November 2012, Incorporating Change 1, 20 Nov. 2014. Information environment is defined as "The aggregate of individuals, organizations, and systems that collect, process, disseminate, or act on information."

information internally, ensure command and control, and disrupt enemy information flow.[12] The intent was not to address how audiences with differing worldviews interpret and contextualize information.[13] The current model assumes that any advantage or disadvantage in the IE is the result of effective or ineffective transmission of information. Effective transmission does not always equal effective communication. R.W. Griffin states, "Communication is the process of transmitting information from one person to another. Effective communication is the process of sending a message in such a way that the message received is as close in meaning as possible to the message intended."[14] The future Joint Force will need to transition to a model that helps it visualize how audiences interpret information to facilitate effective and meaningful communication.

The transmission-centric model deconstructs the IE into three separate dimensions through which data flows. The description of the *informational dimension* is also part of the description of the other two dimensions so it becomes difficult to distinguish. The *informational dimension* is where we collect, process, store, disseminate, and protect information. However, humans and computers perform these five functions in both the *physical and cognitive dimensions*. This construct works well in analyzing how data flows through information systems and networks to reach a receiver, but becomes problematic when trying to understand the meaning activities communicate in a pervasive and dynamic IE. Because this model focuses on the flow of information, it separates the mind (cognitive) from the body (physical), and the thoughts (informational) from the mind (cognitive).

To understand how to leverage information and the informational aspects of military activities, the Joint Force must transition to a model that emphasizes how relevant actors assign meaning to information. The use of dimensions in the current model categorizes elements according to where the data sits in the communication process. Characterization of the IE should provide a description of its different characteristics or aspects[15] and explain how they affect meaning by providing context that then leads to understanding.

The Joint Force should refine the current model of the IE to account for the human, physical, and informational aspects that are common to both the OE and the IE. The human, physical, and informational aspects help describe the

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[12] *Measuring the Effects of Net-Centric Warfare*, DoD, Office of the Secretary of Defense Net Assessment, 28 April 1999.
[13] Context is the circumstances that form the setting for an event, statement, or idea in terms of which it can be fully understood and assessed.
[14] Griffin, R. W. *Fundamentals of management*. Third ed. Mason, OH: South-Western Cengage Learning, 2012. Cengage Learning. Web. 10 July 2017.
[15] An aspect is a specific way in which something can be considered.

interactions that take place in an environment of cooperation, competition, and conflict. Human aspects can frame why relevant actors perceive a situation in a particular way. Physical aspects are critical elements of group identity and frame how tribes and communities form. Finally, informational aspects can reflect how populations communicate with each other and amongst themselves. Understanding the interplay between the informational, physical, and human aspects provides a unified view of the IE and the OE that does not currently exist in doctrine. JCOIE focuses on how these three aspects relate to the IE.[16]

Informational aspects reflect the way that individuals, information systems, and groups communicate and exchange information. Informational aspects are the features and details of activities that an observer interprets and uses to assign meaning. Informational aspects include, but are not limited to timing, platforms, location, and duration. They are the sensory inputs used by individuals, systems, or groups to assign meaning and gain understanding about the world. Informational aspects derived from sensory inputs that are physical in nature are generally more impactful. In other words, actions speak louder than words.

Physical Aspects are the material characteristics, both natural and manufactured, of the environment that create constraints and freedoms on the people and information systems that operate in it. Physical aspects are critical elements of group identity and frame how tribes and communities form. Additionally, physical aspects enhance or inhibit how people exchange information.

Human aspects reflect the foundation from which humans interact with other humans and their environment. The linguistic, social, cultural, psychological, and physical elements that shape human behavior form this foundation. The character, tradition, and nature of relevant actors are all human aspects that suggest how they might behave under particular circumstances in the future.[17]

Describing a system using the informational, physical, and human aspects, whether it is a communication network or social system, enables the analysis of the interaction among those aspects. An improved ability to analyze these inextricably linked aspects will provide insight into a population's worldview

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[16] Further study is required to provide an analytic framework for visualization of this unified view.
[17] Discussion of the human aspects from *Joint Concept for Human Aspects of Military Operations*. 19 October 2016. Web. http://nsiteam.com/joint-concept-for-human-aspects-of-military-operations-jc-hamo/ and from Land Warfare Development Centre. *Land Operations*. Army Doctrine Publication AC 71940. Wiltshire, BA: Warfare Branch Editor, HQ Field Army. N.d.

that frames the perceptions, attitudes, and other elements that drive their behaviors.

Information technology has significantly enhanced human interaction around the globe and elevated the importance of information as an instrument of power wielded by individuals and societies in politics, economics, and warfare. Advances in information technology have significantly changed the generation of, transmission of, reception of, and reaction to information. These advances have increased the speed and range of information, diffused power[18] over information, and shifted socio-cultural norms. The interplay between these advances provides our competitors and adversaries additional ways to offset the diminishing physical overmatch of the world's preeminent warfighting force.

Technological advances have increased the speed and range at which humans acquire, develop, and transfer information. These advances have provided competitors and adversaries the ways and means to use information to affect decision-making. Additionally, they have used information to undermine the legitimacy of joint forces with relevant audiences. Effective use of information by competitors and adversaries has often caught joint forces unprepared and unable to respond to the high volume of multi-channel propaganda sent via text, video, audio, and still imagery propagated via the Internet, social media, satellite television, and traditional radio and television broadcasting.[19] Additionally, advanced information technologies have made operational areas more lethal, more complex, and more dispersed. Technological advancements have decreased the observation-orientation-decision-action cycle time by making it possible for information from a sensor to be directly transmitted to the shooter, thus enhancing physical power.[20] This decrease applies not just to the traditional sensor-shooter relationship, but also to groups and individuals where the diffusion of technology has lowered the barriers to entry to transform them from a sensor into a shooter. Individuals now have the ability to sense, create, transform, and disseminate information globally to achieve strategic effects.

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[18] Nye, Joseph S. 2014. The Information Revolution and Soft Power. *Current History* 113(759): 19-22. Web. http://www.currenthistory.com/Article.php?

[19] Paul, Christopher and Miriam Matthews, *The Russian "Firehose of Falsehood" Propaganda Model: Why It Might Work and Options to Counter It*, Santa Monica, Calif.: RAND Corporation, PE-198-OSD, 2016. As of March 30, 2017: https://www.rand.org/pubs/perspectives/PE198.html

[20] Chapman, William G. *Organizational concepts for the sensor-to-shooter world: the impact of real-time information on airpower targeting.* Thesis. School of Advanced Airpower Studies, 1997. Montgomery: Air U Press, 1197. Defense Technical Information Center. Web. 11 Oct. 2016. http://www.dtic.mil/cgi-bin/GetTRDoc?Location=U2&doc=GetTRDoc.pdf&AD=ADA349387.

The diffusion of power over information and information technology has allowed individuals and groups to enter into and affect the global forum. The power to act as agents of social and political change was once the purview of nation states. However, information has become distributed and difficult to control, therefore shifting the power to influence perceptions and behavior. Individuals are now fully capable of sensing, creating, transforming, and disseminating information globally to mobilize others to action. Now populations, formal organizations, informal organizations, and individuals are able to spread ideas, to gain momentum, and to motivate others to action. This diffusion of power of information has enabled individuals and populations to become active facilitators of change both inside and outside their country of origin.[21]

A shift in the socio-cultural context of rules, norms, and accepted behavior has changed how the Joint Force conducts military activities. The ability of the Joint Force to inform public perception of military activities directly affects its freedom of action. Access to near-real-time information provides the public a forum to contest the legitimacy of military activities. These public forums are shifting socio-cultural norms regarding acceptable practices and are increasing the sensitivity to collateral damage (to both population centers and culturally significant sites). This heightened sensitivity can impede the design and execution of military operations. While the Joint Force conducts operations within socio-cultural rules, norms, and accepted behavior, our adversaries may not and they will not hesitate to leverage them against us.[22]

Recent Challenges

The Joint Force has often been ineffective at integrating the full range of capabilities to maintain freedom of action in and through the IE.[23] The Joint Force, hampered by its policies, conventions, cultural mindsets, and approaches to information, has built barriers fostering a disconnected approach to conducting activities in and through a pervasive IE. As a result, joint forces have not capitalized on the full extent of psychological and socio-cultural effects generated by military activities, both physical and

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[21] Butale expands on the impact of refugee flows. See Butale, Cheludo. "The socio-cultural impact of cross-border refugee flows ..." *International Association for Political Science Students.* 16 April 2015. Web. http://www.iapss.org/wp/2015/04/16/the-socio-cultural-impact-of-cross-border-refugee-flows-and-the-possible-spread-of-conflicts-in-host-countries-in-africa/#sthash.hhkX68b1.dpuf.

[22] Gray, Colin S. *Recognizing and understanding revolutionary change in warfare the sovereignty of context.* Carlisle, PA: Strategic Studies Institute, U.S. Army War College, 1 February 2006. Web. https://ssi.armywarcollege.edu/pubs /display.cfm?pubID=640.

[23] *Decade of War*, p11. Suffolk, VA: Joint and Coalition Operational Analysis, 2012. Web. http://handle.dtic.mil/100.2/ADA570341

informational. While the Joint Force was slow to change its approach, its adversaries were not. They have adapted rapidly to develop considerable skill in using new means of communication to create an operational advantage.[24]

Today, competitors and adversaries, unfettered by restrictive policies or the need for truth, understand the impact of information and are adept at integrating physical and informational power to achieve operational and strategic ends. Violent extremist organizations (VEO) use various capabilities to exploit, disrupt, and disable command and control systems; to disseminate propaganda and disinformation; to foster internal dissent; to recruit and solicit financing; and to promote legitimacy for their actions while discrediting the legitimacy of others. Russian operations in Ukraine demonstrated their commitment to a mode of conflict that includes operations to affect perceptions that drive desired behaviors as well as to destroy or disrupt targets. Similarly, China's "Three Warfares"[25] warfighting strategy includes legal, media, and psychological warfare to achieve desired effects.

The increased speed and momentum of human interaction allows adversaries to operate beyond physical battlegrounds to foster their narrative and spread disinformation. Adversaries design operations to support indirect strategies focused on the use of information. Some adversaries conduct long campaigns below our threat threshold (i.e., competition short of armed conflict) that erode U.S. cooperative commitments and place greater emphasis on unconventional tactics such as propaganda, cyberattacks, economic coercion, and political warfare.[26]

The Joint Force has lacked emphasis, policy, resources, training, and education to address the full power of information. The Joint Force has failed to maximize the potential of informational power. Recent studies have identified the following areas that contributed to this failure:

- Inadequate understanding of the OE:

    o "…traditional intelligence effort tended to focus on enemy groups and actions, it often neglected 'white' information about the population."[27]

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[24] Ibid

[25] Walton, Timothy. A. *China's Three Warfares*. Herndon: Delex Consulting, Studies, and Analysis, 18 January 2012. Web. http://www.delex.com/data/files/Three%20Warfares.pdf.   For further appreciation on this topic read *Unrestricted Warfare* by Qiao Liang and Wang Xiangsui, where they discuss non-military methods of warfare.

[26] Brands, Hal. "Paradoxes of the Gray Zone." Foreign Policy Research Institute. 5 February 2016. Web. http://www.fpri.org/article/2016/02/paradoxes-gray-zone/

[27] Decade of War. Suffolk, VA: Joint and Coalition Operational Analysis, 2012. Web. http://handle.dtic.mil/100.2/ADA570341

- Lack of effective interorganizational coordination.

- Ineffective organization of Joint Force information capabilities.[28]

- Ambiguity of doctrine and terminology.[29]

- Incomplete assessment of the effectiveness of military activities.[30]

- Limited ability to recognize and understand narratives:

   o "The US was slow to recognize the importance of information and the battle for the narrative in achieving objectives at all levels; it was often ineffective in applying and aligning the narrative to goals and desired end states."[31]

- Insufficient authorities to execute at the appropriate level.[32]

- Reluctance to acknowledge that physical capabilities create informational effects.[33]

In contrast, the Joint Force's adversaries are bolder and accept more risk operating in this changing IE. As a result, they create political, social, and military advantages that exceed their traditional combat power. The ability of our adversaries to leverage the power of information to frustrate the most technologically advanced militaries in the world demonstrates the importance of understanding informational power, and highlights the need to master operating in the IE.

Fundamentally, war will remain a contest of wills. Armed conflict and competition will continue to occur and present a complex challenge for the Joint Force, in part because adversaries are increasingly capable and elusive.

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[28] Munoz, Arturo, and Erin Dick. *Information Operations: The Imperative of Doctrine Harmonization and Measures of Effectiveness.* Publication no. PE-128-OSD: Rand Corporation, 2015. Web. https://www.rand.org/pubs/perspectives/PE128.readonline.html

[29] ibid

[30] United States Joint Forces Command. *Joint Information Operations Force Optimization Study: How to Best Organize, Integrate, Assess, and Train Information Operations.* 31 August 2010.

[31] *Decade of War*, p2. Suffolk, VA: Joint and Coalition Operational Analysis, 2012. Web. http://handle.dtic.mil/100.2/ADA570341

[32] *Ibid*, p9.

[33] Paul, Christopher (2011). *Strategic communication: Origins, concepts, and current debates.* Santa Barbara: Praeger Publishers.

These adversaries are successfully leveraging physical and informational power to contest international norms and create persistent disorder.[34]

Emerging Challenges

The Joint Force will face two interrelated challenges in the future security environment. The first challenge is contested norms in which powerful actors, dissatisfied with the status quo, will capitalize on changes in communication and changes in socio-cultural contexts to contest norms governing international behavior. Furthermore, they will strive to compel change at the expense of the United States, its allies, partners, and global interests. The second challenge is persistent disorder, in which weak states are incapable of maintaining domestic order in the face of crisis.[35] The interplay among technological advances, relevant actor(s), and the socio-cultural contexts of accepted rules, norms, and behaviors continually redefine these challenges in a rapidly evolving IE.[36] Future competitors and adversaries will not constrain themselves to how people communicate today. Instead, they will combine new strategies and new technologies (artificial intelligence, big data, neuro-technological, etc....) with traditional techniques such as violence, propaganda, and deception to support their efforts and disrupt U.S. and coalition operations.

Implications for the Future Joint Force

The increasing importance of information requires that the Joint Force move beyond the current paradigm focused primarily on physical power. The American way of war has been one of attrition warfare using physical power to impose its will by wearing down the enemy to the point of collapse through continuous losses in personnel and materiel. This way of war does not account for the change in how state and non-state actors express their will by leveraging information to mobilize groups to support their efforts and frustrate USG objectives. Military power can and should aim to alter behavior of relevant actors to support the achievement of enduring strategic outcomes. All military actions generate observable or discoverable information that produces effects on perceptions, attitudes, and other elements that ultimately drive behavior.

The Joint Force must adapt to changing conditions in the future security environment through understanding the linkage between ongoing operations

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[34] *Joint Operating Environment 2035.* Defense Technical Information Center, 14 Jul. 2016.
[35] Ibid.
[36] The term socio-cultural context is borrowed from Colin Gray while the idea itself as represented in this concept is informed by Gray and Neil Postman. See Gray, Colin S. *Recognizing and Understanding Revolutionary Change In Warfare The Sovereignty of Context.* Carlisle, PA: Strategic Studies Institute, U.S. Army War College, 1 February 2006. Web. https://ssi.armywarcollege.edu/pubs /display.cfm?pubID=640. Postman, Neil. "The Information Environment." *ETC: A Review of General Semantics* 36.3 (Fall 1979): 234-45. JSTOR. Web..

against adversary networks, the discrete application of lethal strikes, and efforts to understand the informational impacts on its own operations.

The Joint Force must understand, blunt, and counter adversary use of ideas, images, and violence designed to manipulate the United States, its allies, and its partners. The Joint Force blunts adversary tactics by reinforcing compelling narratives through deliberate informational and physical actions designed to promote cooperation and to reassure allies and partners. The Joint Force and interorganizational partners must understand how and when to lead with information in order to shape the future security environment. Joint forces must apply emerging technical capabilities, including persistent intelligence and data collection, to access and make sense of dynamic, encrypted systems and networks. Joint forces must blend these emerging technical capabilities with socio-cultural analysis to inform the integration of physical and informational activities, in a sustained approach, to enable the freedom of action.

3. The Military Challenge for the Joint Force

Paradigm Shift

[Information] must be built into Joint Force thinking from the ground up.

General Dunford, CJCS
Joint Force Quarterly 84
1st Quarter 2017

How will the Joint Force integrate physical and informational power to change or maintain perceptions, attitudes, and other elements that drive desired behaviors of relevant actors in an increasingly pervasive and connected IE to produce enduring strategic outcomes?

4. Central Idea

The Joint Force must build information into operational art to design operations that deliberately leverage the informational aspects of military activities.

To achieve enduring strategic outcomes, the Joint Force will integrate physical and informational power to affect the perceptions, attitudes, and other elements that drive desired behaviors of relevant actors. This ability to leverage information deliberately as well as the inherent informational aspects of military activities requires the Joint Force to:

- Understand information, the informational aspects of military activities, and informational power.

- Institutionalize the integration of physical and informational power.

- Operationalize the integration of physical and informational power.

Understand Information, the Informational Aspects of Military Activities, and Informational Power

Information has always played a significant role in military endeavors. However, the Joint Force often treats information as an enabler to physical power vice an instrument of military power in its own right. Information technology has enabled the Joint Force to increase its combat power (disruptive and destructive force) in the operational area to achieve greater speed of command, lethality, survivability, and responsiveness.[37] Joint forces must design operations that expand how they use information to maximize the efficiency and effectiveness of military power by capitalizing on constructive as well as destructive activities to achieve durable political outcomes.

On top of collecting, processing, and disseminating information, joint forces must use information to change or maintain the perceptions, attitudes, and other elements that drive desired behaviors of relevant actors. The Joint Force will maximize the full range of military power, from constructive to destructive, by leveraging the inherent informational aspects of physical power and integrating them with informational power to form a functioning unified whole.[38] To do this, the Joint Force must first understand information, informational aspects of military activities, and informational power.

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[37] Sen, Gautam. *Conceptualizing Security for India in the 21st Century*. New Delhi: Atlantic Publishers & Distributors, 2007.
[38] Army Capabilities Integration Center, *Army Vision – Force 2025 White Paper*. 23 January 2014. Web.
http://www.arcic.army.mil/app_Documents /USArmy_ WhitePaper_Army-Vision-Force-2025_23JAN2014.pdf

Information

Fundamentally, information is organized data presented within a context that gives it meaning and relevance, and can lead to an increase in understanding and a decrease in uncertainty.[39] Data and information from the physical world form the basis of knowledge and shared understanding. The cognitive hierarchy model represented in doctrine (Figure 2) provides an approach to building a shared understanding from data and information.[40]

Individuals, groups, communities, and nations share or compete for information, ideas, perceptions, and thoughts. Relevant actors use information to inform or influence other individuals, groups, communities, and nations. Relevant actors can acquire, process, distribute, and act on information in ways that can affect the conditions, circumstances, and influences that affect the employment of capabilities and bear on the decisions of the commander.
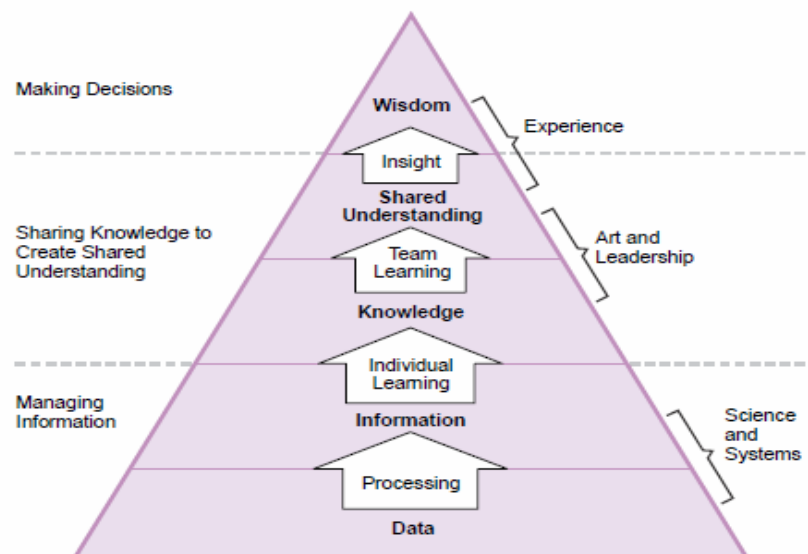

Figure 2: Cognitive Hierarchy Model

To achieve strategic outcomes that hinge on the perceptions, attitudes, and other elements that drive behaviors, the Joint Force must understand how relevant actors perceive and ultimately understand information. The cognitive hierarchy model provides a bottom-up view of this process. However, a top-down approach, as depicted in the Sentient Information Model (see Figure 3),[41]

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[39] Kuzemskiĭ, A. L. Statistical mechanics and the physics of many-particle model systems. Singapore: World Scientific Co. Pte. Ltd., 2017.

[40] Joint Publication 3-0, Joint Operations. Defense Technical Informational Center, 17 Jan. 2017.

[41] Sparling, Bryan. N. *Information Theory as a Foundation for Military Operations in the 21st Century*, 24 May 2002. Web. Defense Technical Information Center: www.dtic.mil/cgi-bin/GetTRDoc?AD=ADA403845

places understanding by the relevant actor in the center. This focus provides better insight into how meaning leads to understanding within a context of sensory inputs from the physical world. New data and information can create and generate new knowledge. It can also challenge old knowledge or be rejected, reinterpreted, or strongly conditioned by old knowledge. An individual's experience and background (social, cultural, physical, informational, and psychological elements) combine with knowledge and understanding to form perceptions, attitudes, and other elements that ultimately drive behaviors.
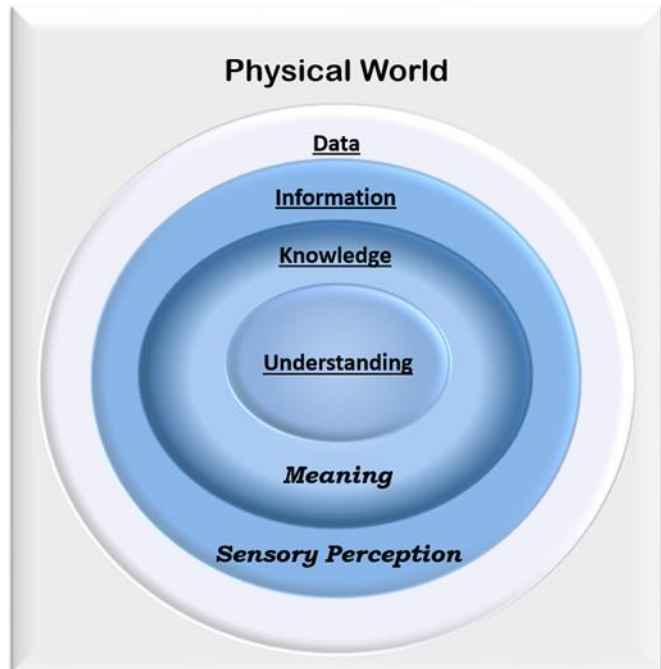

Figure 3: The Sentient Information Model

Decision makers, either human or machine-based, determine the utility of information by its ability to provide a deeper level of understanding and its potential implications for future military operations.[42] Much of the observed information, while potentially meaningful, may not be relevant to formulate decisions. While judgment remains a uniquely human quality, machines will increasingly assist in evaluating information with the intent of improving the speed and quality of human decision-making.

> *Lying offshore, ready to act, the presence of ships and Marines sometimes means much more than just having air power or ship's fire, when it comes to deterring a crisis. The ships and Marines may not have to do anything but lie offshore.*
>
> *General Colin Powell*

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[42] Ibid.

Informational aspects of military activities

    Military activities are the full range of deeds, actions, and functions conducted by the military. Every Joint Force action, written or spoken word, and displayed or relayed image has informational aspects that communicate a message or intent.[43] Informational aspects are the features and details of activities that an observer interprets and uses to assign meaning. Whether or not the Joint Force intends to communicate a specific message, observers will interpret the military activity through their personal worldview. For example, military activities such as punitive action (e.g., the missile launch in response to the U.S. Embassy bombing in Kenya and Tanzania), coalition and joint exercises, and freedom of navigation in the global commons are all physical actions that have informational aspects.

    The informational aspects of military activities are where physical power and informational power blends. The Joint Force uses physical means such as the massive ordnance air burst (MOAB), also known as the "mother of all bombs," mentioned below, to purposefully send a specific message and create a desired effect. The Joint Force also purposefully uses certain information-related capabilities to affect relevant actors. However, it is impossible to conduct military activities without communicating a message. The Joint Force must understand how to manipulate and leverage the inherent informational aspects of military activities to ensure the message sent is the message intended and to mitigate the unintended interpretations of military activities.

The Mother of All Bombs (MOAB)

    This time, the MOAB served its best strategic purpose—though that may extend beyond the actual impact. Dropping the mother of all bombs also sends a message "to the Taliban that there's a new sheriff in town," says the national security official. Presumably also to ISIS, North Korea, and Iran. Moreover, the fact that it is such a big blast does not hurt for courting media attention that helps deliver that warning.

    "Most generally, use of a bomb of this size now is probably a broad warning to others to avoid brinksmanship with the United States," says Rebecca Zimmerman, a policy researcher at Rand.

    "You … wouldn't cover the story if this was 10 JDAMs. Same mission, different bombs," Singer says. The MOAB, though, makes an impact.

    Excerpts from "That 'Mother of All Bombs' Was Just Waiting for the Right…"[44]

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[43] Joint Publication 1, *Doctrine for the Armed Forces of the United States*. Defense Technical Informational Center, 25 March 2013.
[44] Dreyfuss, Emily. "That 'Mother of All Bombs' Was Just Waiting For the Right …" Wired.com. N.p., 13 Apr. 2017. Web. https://www.wired.com/2017/04/mother-bombs-just-waiting-right-target/.

Interpretations and perceptions of military activities depend on the frame through which relevant actors view the world around them, often called a worldview.[45] A worldview is a mental model of reality—a framework of ideas and attitudes. The beliefs, values, narratives, and behaviors of a culture inform the worldview of a relevant actor. That worldview then frames the informational aspects of military activities to assign meaning. That assigned meaning can reinforce an actor's perceptions and attitudes or alter them. Perceptions and attitudes determine responses to observed actions, words, or images.[46]

Informational Power

Power is the ability to cause relevant actors to act in accordance with our interests.[47] Information is both a resource and an instrument of power at the national-level, but it is also an instrument of power for the military. This concept uses informational power to convey the military's use of information to shape the perceptions, attitudes, and other elements that drive desired behaviors and shape the course of events.

The Joint Force applies informational power to achieve three ends:

- To change or maintain the observations, perceptions, attitudes, and other elements that drive desired behaviors of relevant actors.

- To protect and ensure the observations, perceptions, attitudes, decisions, and behaviors of the Joint Force, its allies, and its partners.

- To acquire, process, distribute, and employ data to enhance combat power.

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[45] World Bank. World Development Report 2015: Mind, Society, and Behavior (Ch 3, pg 64). Washington, DC: Publishing and Knowledge Division, 2015.

[46] Individuals do not respond to objective experience but to their mental representations of experience. In constructing their mental representations, people use interpretive frames provided by mental models. People may have access to multiple and conflicting mental models. Context can activate a particular mental model. Using a different mental model can change the individual's mental representation of the world around him. See World Development Report 2015: Mind, Society, and Behavior Published: December 2014 Pages: 62 – 75. Web. http://dx.doi.org/10.1596/978-1-4648-0342-0_ch3

[47] Power is the capacity or ability to direct or influence the behavior of others or the course of events (produce an effect). English Oxford Living Dictionaries. Web. https://en.oxforddictionaries.com/definition/power

> *We conduct all operations in order to influence people and events, to bring about change, whether by 155mm artillery shells or hosting visits: these are all influence operations. We sought to make use of every lever we had to influence events.*
>
> *Major General Graham Binns*
> *General Officer Commanding*
> *1st (UK) Armoured Division*

To date, joint forces have primarily targeted the capabilities or decision-making nodes of their adversaries. This has resulted in battlefield victories, but has not consistently produced enduring strategic outcomes. Joint forces should understand the nature of the problem and set the conditions to produce favorable outcomes over time. Commanders must leverage information into the design of all operations to maximize military power by applying informational power with the same acumen and skill with which they leverage physical power.

> *For the changing character of war in the information age will require military forces that recognize seizing or controlling terrain is:*
> * *secondary to protecting innocent lives, and that*
> * *capturing perceptions is the new "high ground" in today's conflicts, as the moral is to the materiel as three is to one...*
>
> *General Mattis*
> *Supreme Allied Commander Transformation*
> *7 July 2009*

Joint forces must treat the IE as terrain and shape conditions by deliberately leveraging informational aspects to integrate physical and informational power. Shaping the IE is relevant in all military operations and activities across the conflict continuum (Figure 4).[48]

Competitors and adversaries will attempt to gain an advantage in the IE by manipulating information, particularly information regarding their activities as well as activities of the Joint Force, its allies, and its partners. Commanders apply initiative to anticipate, proactively counter, and defend against these tactics and mitigate their effects. The Joint Force must blunt such competitor and adversary use of ideas, images, and violence designed to manipulate the United States and its allies.[49]

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[48] Joint Publication 3-0, *Joint Operations*. Defense Technical Informational Center, 17 Jan. 2017.
[49] Joint Operating Environment 2035. Defense Technical Information Center, 14 Jul. 2016.
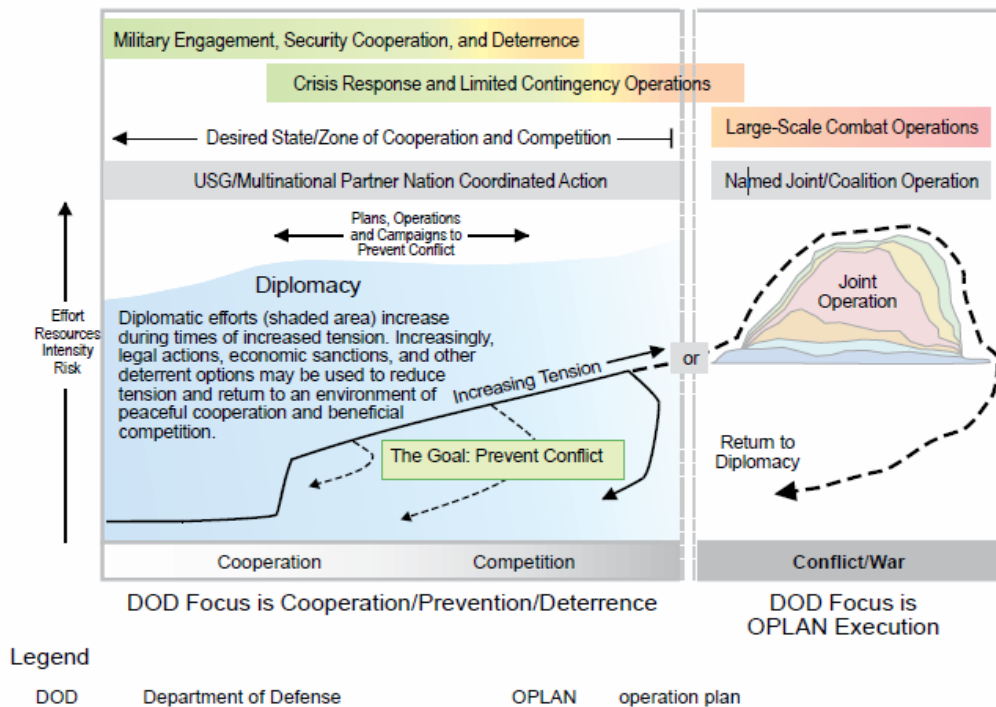
The Conflict Continuum

Figure 4: The Conflict Continuum

Information is integral to planning and operations; it provides the fuel to make decisions and provides commanders the ability to generate and apply informational power. The Joint Force must be adept at leveraging information to expand, deny, or manipulate access of an adversary to their mission-essential information. The Joint Concept for Electromagnetic Spectrum Operations and the Joint Concept for Cyberspace Operations address many of the capabilities required to protect the Joint Force's ability to acquire, process, distribute and act on information to enhance combat power.[50] The Joint Force must preserve friendly mission-essential information, affect rival mission-essential information, and attack rival forces.[51]

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[50] *Joint Concept for Electromagnetic Spectrum Operations* (p. 17). 18 Mar. 2015. Print.
[51] *Joint Concept for Cyberspace*, Version 2.0 (p. 14, 23-28). 23 Dec. 2015. Print.

Adversary Use of Ideas, Images, and Violence

During Operation Valhalla in Iraq in March 2006, a battalion of U.S. Special Forces Soldiers engaged a Jaish al-Mahdi death squad, killing 16 or 17, capturing 17, destroying a weapons cache, and rescuing a badly beaten hostage.

In the relatively short amount of time, it took the soldiers to get back to their base—less than one hour—Jaish al-Mahdi soldiers returned to the scene and rearranged the bodies of their fallen comrades to make it seem the squad was murdered while in the act of prayer. The adversary then disseminated both pictures and press releases in Arabic and English, which depicted the alleged atrocity.

The U.S. unit had filmed its entire action and could prove this is not what happened. Yet it took almost three days before the U.S. military attempted to tell its side of the story in the media. The Army launched an investigation that lasted 30 days, during which time the battalion was out of commission.

The Jaish al-Mahdi operation is an excellent example of how adversaries leverage information without using physical force to affect perceptions, attitudes, and other elements that drive desired behaviors. This incident was one of the first clear demonstrations of how adversaries can now openly monitor American audience reactions to their messaging, in real time, from thousands of miles away and fine tune their actions accordingly. With unlimited global access and the ability to leverage information, adversaries were able to mitigate the physical overmatch of the joint force, paralyze the USG with policy and legal issues, and gain freedom of action.[52]

Institutionalize the Integration of Physical and Informational Power

The Joint Force must normalize the integration of physical and informational power in its organization and culture. To institutionalize this concept, the Joint Force must elevate information in strategy and operational art, design operationally coherent joint formations, promote unity of effort, provide best military advice, and enable a whole-of-government approach.

To achieve success in the future security environment, the Joint Force must shift how it thinks about information from the sole purview of information professionals to a foundational consideration for all military activities. Joint Force engagement in persistent competition and conflict within the IE mandates that it man, train, and equip itself to achieve and maintain

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[52] The Weaponization of Information, The Need for Cognitive Security; (testimony of Waltzman). Print

strategic outcomes that may hinge on the perceptions, attitudes, and other elements that drive desired behaviors of relevant actors.

The Joint Force must be as capable of using information to change or maintain the perceptions, attitudes, and other elements that drive desired behaviors of relevant actors (to include its own) as it is at dominating in battle. Additionally, it must acquire, process, and share information to develop the common understanding needed for commanders to be decisive. Institutionalizing the role of information throughout doctrine, organization, training, materiel, leadership and education, personnel, facilities, and policy development enables the Joint Force to leverage information and the informational aspects of military activities and realize the full potential of military power.

1. Elevate Information in Strategy and Operational Art

Fundamentally, U.S. strategies aim to cause relevant actors (militaries, non-state actors, governments, organizations, and populations) to act in ways that support our national interests. Commanders employ operational art to connect tactical actions to strategic objectives. Future leader development and education must inculcate information and informational power into strategy and operational art.[53]

The full integration of physical and informational power requires a paradigm shift in how the Joint Force thinks about the application of power. This shift must begin with a foundational knowledge of informational aspects of military activities and informational power established through education and training. The Joint Force must change how it views, plans, and executes operations, particularly with respect to various audiences' perceptions of a joint force's military activities. Instead of relying primarily on physical power, the Joint Force must transition to an approach that builds information into operations that deliberately leverage information and the informational aspects of military activities to affect the perceptions, attitudes, and other elements to drive desired behaviors.

Commanders' intent must describe the desired conditions in terms of desired behaviors needed to support enduring strategic outcomes. Maximizing effectiveness by leveraging the inherent informational aspects of military activities will expand the range of options available to the Joint Force Commander (JFC). An understanding of how military activities affect perceptions, attitudes, and other elements that drive desired behaviors informs

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[53] *Joint Concept for Rapid Aggregation.* Defense Technical Information Center, 22 May 2015. www.dtic.mil/doctrine/concepts/jointconcepts/joint_concept_rapid_aggregation.pdf
[53] Joint Publication 5-0, *Joint Operation Planning.* Defense Technical Informational Center, 11 August 2011.

the integration and sequencing of those military activities. Leveraging informational aspects such as, timing, platforms, location, and duration, can be a force multiplier that enables a more effective allocation of resources. Finally, commanders must think in terms of what they can accomplish with the application of military power through a global cross-domain[54] perspective unhampered by Service parochialism.

2. Design Operationally Coherent Joint Formations

Operationally coherent joint formations are complete, well connected, and work closely and efficiently together internally and externally with interorganizational partners.[55] To apply informational power as effectively as it applies physical power, the Joint Force must draw required capabilities and expertise from across domains, echelons, geographic boundaries, and organizational affiliations to support operationally coherent joint formations. These coherent joint formations must work together, both internally and with interorganizational partners, to align tactical and operational activities to change or maintain the perceptions, attitudes, and other elements that drive desired behaviors leading to strategic outcomes.

Coherent joint formations require a common understanding and approach to integrate physical and informational power to change or maintain perceptions, attitudes, and other elements that drive desired behaviors. This common understanding begins with shared situational awareness, a common lexicon, standardization of processes, and establishment of relationships that reduce or eliminate barriers to integration of physical power and informational power.

The Joint Force must experiment with organizational structures to maximize its ability to gain an information advantage. Additionally, the Joint Force must experiment with tactics, techniques, and procedures designed to sustain or change the perceptions, attitudes, and other elements that drive desired behaviors of relevant actors. It is through education and training that the Joint Force normalizes the processes and thinking necessary to leverage information and inherent informational aspects of military activities. The Joint Force must leverage scientific advances to enhance capabilities to operate in the IE. Adopting advances in technology, social science, and the behavioral sciences will enable joint forces to gain and maintain an information advantage.

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[54] Note: Taken from *Global Integrated Operations*, but related to Service ideas of Single battle (USMC), Multi-domain battle (Army), Single Multi-domain battle (Army), and Multi-domain (Air Force).
[55] *Joint Concept for Rapid Aggregation.* Defense Technical Information Center, 22 May 2015. www.dtic.mil/doctrine/concepts/jointconcepts/joint_concept_rapid_aggregation.pdf

3. Promote Unity of Effort

"Achieving unity of effort to meet national security and national defense goals has always been problematic due to challenges in information sharing, competing priorities, geographic mismatches, differences in lexicon, and uncoordinated activities."[56] A common understanding is key to establishing the unified logic required between all participants when working towards a common goal. It is also fundamental to planning and executing operations designed to affect the perceptions, attitudes, and other elements that drive desired behaviors of relevant actors.

Joint forces seek to achieve unity of effort through unified action, a fundamental joint construct that refers to the synchronization, coordination, and integration of activities of governmental and non-governmental entities. Interagency coordination more specifically refers to interaction among USG agencies toward common goals. Consistent integration of words and actions with interorganizational partners can facilitate and support narratives that achieve unity of effort. By defining a joint force's objectives appropriately and clearly, in terms of the desired behaviors of relevant actors as well as in terms of destroying an adversary's capability or order of battle, a JFC will increase the opportunity to establish a common vision, goals, and objectives to achieve unity of effort toward mission success.

4. Provide Best Military Advice

The Joint Force must educate and train personnel to provide the best military advice to military and civilian leaders regarding advantages and risks of applying informational power. The *Decade of War*[57] identified insufficient authorities to execute at the appropriate level as an impediment to informational power limiting the full potential of military power. Others have argued that the military has all the authorities it needs, but lacks permission to act. The ability to articulate clearly the advantages and risks associated with informational power is necessary to attaining approvals, authorizations, or permissions. Informational activities to contest the IE are typically overly restrictive due to policy guidance in fear of unintended effects.

The Joint Force must identify, mitigate, and, where appropriate, adjust or remove the policy, geographical, and interorganizational barriers that create conflicting priorities and inhibit integration of physical and informational power. Clearly articulated policies and flexible authorities and permissions should facilitate the commander's ability to conduct agile and timely operations

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[56] Joint Staff J7. Unity of Effort Framework Solution Guide. Defense Technical Information Center: Washington D.C. 31 Aug. 2013. Web. https://www.dtic.mil/doctrine/jwfc/uef_solution_guide.pdf
[57] *Decade of War*. Suffolk, VA: Joint and Coalition Operational Analysis, 2012. Web. http://handle.dtic.mil/100.2/ADA570341

in the IE. With a thorough understanding and management of the risk of employing informational power, joint forces will be able to release a video as timely as they are able to release a bomb. The Joint Force must be proactive in its approach and can no longer allow its adversaries to make the first impression— first impressions are difficult or impossible to overcome, even when false.

5. Enable a Whole-of-Government Approach

Operating in and through the IE in a whole-of-government approach requires capabilities that exist beyond the Department of Defense (DoD). Facilitating a whole-of-government approach requires focus on two levels. The first is interaction between the Joint Force and other U.S. departments and agencies to facilitate a common picture, understanding, and agreement on unified action with respect to a specific operation. The second level is interaction between Combatant Commanders and JFCs whose staff members interact with U.S. agency representatives, such as ambassadors in the area where operations will occur. Additionally, the Joint Force must engage interorganizational partners to assist in policy formation and operational methods to support ongoing and planned operations, as well as a long-term National Security Strategy. Future policy should allow for authorities enabling joint forces to operate at the speed of information.

Resolution of transregional problems increasingly requires integration of physical and informational power by the Joint Force, allies, and interorganizational partners. The Joint Force must assist in developing mechanisms that facilitate interorganizational engagement achieving unity of effort. The Joint Force must learn how interorganizational partners leverage information, recognize the inherent informational aspects of their activities, and enhance their impact to achieve unity of effort.

Operationalize the Integration of Physical and Informational Power

To produce enduring strategic outcomes that may hinge on perceptions, attitudes and behaviors, the Joint Force must operationalize its application of informational power. This requires that the Joint Force:

1. Develop a better understanding of the informational, physical, and human aspects of the security environment

A shared understanding of the security environment creates a unifying start point for strategy and operational design. The Joint Force must expand analysis of the informational, physical, and human aspects to understand how they influence interactions between and amongst relevant actors.

Informational aspects reflect the way that individuals, systems, and groups communicate and exchange information. This communication can be non-verbal; verbal, through media such as print, radio, television, etc.; or face-to-face verbal and non-verbal communication. Informational aspects are the sensory inputs used by individuals, systems, or groups to assign meaning and gain understanding about their surroundings and the world around them. Informational aspects derived from sensory inputs that are physical in nature are generally more impactful. In other words, actions speak louder than words. Human interaction is expanding and accelerating as the information infrastructure expands globally. Information systems are physical in nature, but have informational aspects. Any digitally connected person has the ability to shape public understanding of, and consensus for (or against) a conflict. Additionally, actors who exploit these means can influence any digitally-connected person.[58]

Physical aspects reflect geography, the natural and manufactured terrain, which creates constraints and freedoms on the people and equipment that operate in it. Geography is associated with group identity, access to resources, and is often rooted in deep cultural and historical factors. Geography can block or enable communication, provide cover from detection or attack, and obstruct or enable movement.[59] Physical aspects also reflect territorial boundaries associated with governments' obligations to provide security for their people.

Human aspects are the foundation from which humans interact with other humans and their environment. Linguistic, social, cultural, physical, and psychological elements that shape human behavior form and influence these interactions. Most people live in towns, cities, and villages, and increasingly in coastal regions. People exist in linguistic, cultural, social, and political groups with specific identities, usually associated with particular territories. Competition for territory and resources, and issues such as injustice and lack of representation are often at the root of conflict. A region's history can provide insight into an actor's character, traditions, and nature—and suggest how people might behave under particular circumstances in the future.[60]

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[58] Land Warfare Development Centre. *Land Operations*. Army Doctrine Publication AC 71940. Wiltshire, BA: Warfare Branch Editor, HQ Field Army. 31 March 2017.
[59] Land Warfare Development Centre. *Land Operations*. Army Doctrine Publication AC 71940. Wiltshire, BA: Warfare Branch Editor, HQ Field Army. 31 March 2017.
[60] Discussion of the human aspects from *Joint Concept for Human Aspects of Military Operations*. 19 October 2016. Web. http://nsiteam.com/joint-concept-for-human-aspects-of-military-operations-jc-hamo/ and from Land Warfare Development Centre. *Land Operations*. Army Doctrine Publication AC 71940. Wiltshire, BA: Warfare Branch Editor, HQ Field Army. N.d.

> **The following is a simplified example to illustrate some of the changes in thinking proposed by JCOIE. It does not capture all the changes and variables represented in this concept. JCOIE presents the example in a linear fashion when in reality there should be feedback loops for each idea. This example continues throughout this section to illustrate the operationalization of JCOIE.**
>
> ### 1. A Better Understanding
>
> **Situation:** A Combatant Command is monitoring a region within its area of responsibility.
>
> **Understanding:** The staff analyzes those informational, physical, and human aspects to gain an understanding of the region. Then it must identify the perceptions, attitudes, and other elements that drive desired behaviors that support or challenge the Theater Campaign Plan objectives. The staff identifies and evaluates relevant actors.[61] This baseline provides an enhanced contextual understanding of what is likely to sustain or change those perceptions, attitudes, and other elements that drive desired behaviors. Allies and partners share and enhance this baseline understanding.

Commanders employ operational art to connect tactical actions to strategic objectives that account for the perceptions, attitudes, and other elements that drive desired behaviors. Characterization of the environment based on a better understanding of its informational, physical, and human aspects will inform strategy and operational design that underpin a campaign or major operation plan and its subsequent execution. The Joint Force must characterize the informational, physical, and human aspects to expose and leverage the interdependencies between them to maintain or change relevant actors' perceptions, attitudes to drive desired behaviors.

The informational, physical, and human aspects of military operations impact the perceptions, attitudes, and other elements that drive desired behaviors. Joint forces must treat the perceptions, attitudes, and other elements that drive desired behaviors as "key terrain." Characterization must include an assessment of the perceptions, attitudes, and other elements that drive the behavior of relevant actors. The Joint Force must integrate information collection efforts with its allies and partners to develop contextual

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[61] *Joint Concept for Human Aspects of Military Operations.* 19 October 2016. Web. http://nsiteam.com/joint-concept-for-human-aspects-of-military-operations-jc-hamo/

understanding of cooperation, competition, and armed conflict through the characterization of relevant actors. The Joint Force must understand how its competitors and adversaries are likely to view friendly activities in order to anticipate potential responses.

To understand the perceptions, attitudes, and other elements that drive desired behaviors of competitors and adversaries, the Joint Force must first understand how its own biases influence its characterization of the security environment.[62]

2. Detect changes in the security environment that may enable or impede success.

Understanding the OE is critical to identifying changes affecting the Joint Force's ability to achieve plan objectives. While changes within the OE may be significant, they are not all relevant to joint forces. Joint forces must identify those changes that provide opportunities to alter or maintain the perceptions, attitudes, and other elements to drive desired behaviors.

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2. Detect Relevant Change

Observed Change: After developing a common understanding of the environment, intelligence reveals that a violent extremist organization is claiming to transport a weapon of mass destruction into a specific region.

Is the Change Relevant: If the claim is true, transportation of a weapon of mass destruction (WMD) will affect the Combatant Command's objectives. Whether or not it is true, the claim will likely have an impact on the perceptions of relevant actors in the region and is therefore relevant.

</div>

The future Joint Force must identify and understand the significance of the informational aspects of relevant actors' activities. These activities are potential indicators of change as to whether the Joint Force is influencing perceptions, attitudes, and other elements that drive desired behaviors. A transregional, multi-domain, and multi-functional approach is necessary to analyze relevant environmental factors such as economics, politics, transportation, and demographics that provide opportunities or challenges to achieving desired outcomes. The Joint Force must employ analysis techniques using a multi-modal, cross-disciplined approach that broadens current descriptive approaches beyond the limits of the political, military, economic,

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[62] JCOIE presents the central and supporting ideas from a strategic view expressed as the "security environment." However, the Joint Force should also apply these ideas at operational and tactical levels.

social, infrastructure, information — physical environment and time (PMESII-PT) framework to identify relevant change in the security environment.

The Joint Force must employ various analytical methodologies to provide context and identify changes in the security environment. The deliberate application of multi-layered, cross-disciplined, iterative analytical methodologies should enable the Joint Force to better characterize the informational, physical, and human aspects relevant to setting the desired conditions and achieving objectives. These methodologies will provide insight to the Joint Force on worldviews that frame the perceptions, attitudes, and other elements that drive desired behaviors.

The deliberate application of multi-layered, cross-disciplined, iterative analytical approaches will provide context for observations relevant to the JFC and staff. The Joint Force must capture any insights gained from these analytical approaches to improve its baseline understanding of the security environment.

3. Determine the impact of detected changes on the perceptions and behaviors of relevant actors.

Once the Joint Force has identified changes in the security environment, it must understand and anticipate the effect of those changes on the perceptions, attitudes, and other elements that drive desired behaviors. The Joint Force must orient on those changes that provide opportunities or obstacles to setting the conditions for desired outcomes. Experienced judgment combined with the results of multiple analytical methods can provide insight to the impact relevant changes will have towards achieving the commander's objectives.

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3. Determine Impact of the Change

Once the Combatant Command has determined that the WMD claim is relevant, its top priority will be to find and secure it. However, it must also determine the impact on perceptions, attitudes, and other elements that drive desired behaviors of relevant actors (in this case the local population).

The population could perceive the claim as a threat and be motivated to counter VEO activities. Alternatively, the population could perceive the claim to be in their best interest (increased power) and be likely to facilitate and support VEO activities. Understanding the relevant actor's likely response will inform the combatant commander's options.

A variety of analytic methodologies, competitive analytic viewpoints, and multi-disciplined SMEs can help joint forces understand the effect relevant changes will have on relevant actors. This understanding is necessary to leverage activities that capitalize on opportunities or overcome obstacles to achieve enduring strategic outcomes. Taking an interdisciplinary approach includes:

- Examining the problem set through a broad range of lenses (social, economic, legal, and political).

- Understanding how competitors and adversaries shape the environment through propaganda, disinformation, or active measures.

- Orienting on the variety of established and unfolding circumstances that provide opportunities or present obstacles.

- Seeking inputs from other partners to refine the view of the opportunities or obstacles.

- Evaluating the informational, physical, and human aspects of the security environment.

Any insights gained from these must feedback into the baseline understanding of the security environment and inform *the development of options.*

4. Develop options for the commander that deliberately leverage, and integrate, the informational aspects of military power.

Joint forces must integrate physical and informational power regardless of operational phase. Commanders and staff must deliberately design physical and informational activities to increase or decrease ambiguity perceived by competitors and adversaries. The Joint Force must leverage SMEs, technologies, and exercises to assess the potential impact those activities have on the perceptions, attitudes, and other elements that drive behaviors necessary to achieve enduring strategic outcomes.

Operations must strive for the optimal mix of physical and informational activities to drive desired behaviors. Joint forces must enhance lethality by leveraging the informational aspects of military activities to assist in the destruction of the will and capability of the adversary.

Information-related capabilities can emphasize, diminish, obfuscate, or mitigate the effect of physical military activities on the perceptions and

attitudes of relevant actors. Likewise, physical military activities can emphasize, diminish, or mitigate the effect of informational activities on the perceptions and attitudes of relevant actors.

Commanders should use the proper legal frameworks, authorities, and permissions to aggressively seek and vigorously exploit physical and informational advantages while managing risk. The Joint Targeting Process must be flexible across all phases and throughout cooperation, competition, and conflict to enable commanders and staff to target critical perceptions and attitudes.

Leaders must encourage innovation and the consistent integration of actions and words to reinforce the USG narrative for each operational situation. The innovative use of physical and informational power will provide commanders a broader range of options to achieve objectives. Commanders must encourage this innovation through the consistent use of information to affect the observations, perceptions, decisions, and behaviors of relevant actors while protecting and ensuring the observations, perceptions, and decisions of the Joint Force. Additionally, innovation will assure the ability to acquire, process, distribute, and employ data and information to manage understanding and the operational tempo.

Proposed options should:

- Provide a thorough analysis of forces, readiness, and capabilities required to implement options.

- Identify potential undesired effects early so that commanders can develop alternative options.

- Identify when to capitalize on the message of physical force to maximize its effect.

- Recognize opportunities to leverage information to preserve fighting strength and make the Joint Force more lethal.

- Determine the weight of effort between physical and informational activities appropriate to gain and maintain desired conditions.

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4. Develop Options for the Commander

For this example, the Combatant Command identified that the population perceives the WMD claim to be in their best interest (increased power) and are now likely to facilitate and support VEO activities. Through modeling, simulation, and virtual experimentation, the combatant command identifies courses of action that have a high probability of being effective in dissuading the local population from supporting VEO activities.

The Combatant Command's response to dissuade the local population from supporting VEO activities will take an approach that identifies complementary physical and informational activities.

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5. Execute, assess, and modify military activities

Maximizing the effectiveness of military power by leveraging information and the inherent informational aspects of military activities will expand the range of options available to the JFC. The timing, platforms, location, and duration of activities are informational aspects that affect the perceptions, attitudes, and other elements that drive desired behaviors and are important considerations for the effective and efficient allocation of resources. Finally, commanders must think in terms of what they can accomplish with the holistic

application of military power through a global cross-domain[63] perspective, rather than limiting it to integration of Service capabilities.

Joint forces should execute integrated informational and physical activities during cooperation and competition below the threshold of conflict to support broad USG narratives. Additionally, joint forces must execute and evaluate the effects of military activities on the perceptions, attitudes, and other elements that drive desired behaviors of relevant actors. Evaluating desired behaviors and modifying military activities to target perceptions, attitudes, and other elements to drive desired behaviors are critical to achieving the psychological effect required for success.

Joint forces must execute proactive information efforts before, during, and after the conduct of military activities to reinforce desired psychological effects. While executing operations through integrated physical and informational activities, joint forces should establish a series of indicators to assess the effects on relevant actors.

Allies and partners are essential enablers for operations. The Joint Force should actively seek to understand their objectives, limitations, and constraints during the early stages of an emerging competition or crisis. The Joint Force must work with partners to develop and strengthen beneficial narratives and provide alternatives to counter detrimental ones.

Executing, assessing, and modifying military activities will inform the formal feedback cycle to refine how joint forces *determine impact to develop options which*

- Support transregional, multi-domain, multi-functional requirements.

- Identify the informational aspects of military activities that will change or maintain perceptions, attitudes, and other elements that drive desired behaviors.

- Assess the change in perceptions, attitudes, and behaviors in response to Joint Force activities.

- Refine the commander's description of desired conditions.

- Modify joint force activities based on the updated assessment and the desired outcomes of the commander.

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[63] Note: Taken from *Global Integrated Operations*, but related to Service ideas of Single battle (USMC), Multi-domain battle (Army), Single Multi-domain battle (Army), and Multi-domain (Air Force).

5. Capabilities Required by this Concept

The following concept-required capabilities (CRCs) will enable the Joint Force to leverage information and the inherent informational aspects of military activities to change perceptions, attitudes, and other elements that drive desired behaviors of relevant actors and direct the course of events. These CRCs support the JCOIE central idea and its three supporting ideas. The CRCs identified in sections A through C operationalize the JCOIE while the CRCs identified in section D institutionalize the JCOIE. Following concept approval, subsequent analysis of these initial proposed capabilities via DoD capabilities development systems will generate materiel and non-materiel force development implications. This analysis will provide the basis for developing and potentially expanding capability solutions to close operational gaps.

Required Capabilities to Characterize and Assess the Informational, Physical, and Human Aspects of the Environment

Required Capability A.1: The Joint Force requires the ability to determine the impact of relevant informational, physical, and human aspects of the security environment on Joint Force objectives.

Description. The Joint Force will examine the security environment through a broad range of lenses applying an extensive interdisciplinary approach through the application of multiple multi-modal (interdisciplinary) models. The Joint Force will evaluate the interplay between the human, physical, and informational aspect of the IE. The Joint Force will analyze and understand the landscape of relevant narratives. The Joint Force will leverage partnerships, SMEs, and technology to evaluate and describe the capabilities, intent, will, and understanding of relevant actors. This understanding includes identifying ideological-based networks and classifying their motivations, structure, and relationships. It includes understanding relevant actors' tendency to challenge or support Joint Force objectives. The Joint Force will understand the social system in the security environment and describe behavioral trends and drivers of relevant actors.[64, 65]

Desired Effect. The Joint Force is able to provide and maintain enhanced contextual understanding of the interplay between the human, physical, and informational aspect of the IE. The Joint Force leverages opportunities to

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[64] Footnote to Developing a Behavioral Science Approach to Stabilization, COL Stephen G. Ruth, USA & LTC Scott K. Thomson, USAR, Harvard University, John F. Kennedy School of Government National Security Program, 2016
[65] Theoretical Implications for Inform and Influence Activities, S.K. Thomson. SAMS-FLKS 2013, pgs 36-41

shape conditions in the security environment, describe relevant changes within the security environment, and determine their likely impact on Joint Force objectives. The Joint Force is more fully aware of the societal impacts of relevant actors on Joint Force objectives. JFCs gain freedom of action by more quickly discerning opportunity from distraction and more quickly deciding when to act at a time and place of their choosing.

Required Capability A.2: The Joint Force requires the ability to understand the perceptions, attitudes, and other elements that drive behaviors that affect the JFC's objectives.

Description. The Joint Force understands perceptions, attitudes, and other elements that drive behaviors likely to affect relevant actor decision-making. The Joint Force will engage SMEs and leverage technology to employ advanced automated social and technical systems to identify relevant actors including, but not limited to key influencers, centers of influence, and power brokers; and their patterns of behavior, enduring motivations, and collective strengths and weaknesses. Additionally, the Joint Force will leverage technology and partnerships to characterize and recognize how and why relevant actor relationships and motivations change over time by examining underlying conditions and their impact on USG objectives. This will include recognizing changes in how relevant actors receive and interpret information and why relevant actors respond to environmental change(s) to understand influence levers. The Joint Force will develop an ever-refined understanding to derive meaning of the ever-changing security environment.

Desired Effect. The Joint Force is able to produce a distributed view of changes to relevant actors' perceptions, behaviors, inter-relationships, and communications methods. The Joint Force gains enhanced contextual understanding by characterizing impact of relevant actors on the security environment. The Joint Force develops a more nuanced understanding of changes to relevant actor behaviors through applying multiple interdisciplinary models describing relevant actor behavior options. The Joint Force gains insight to levers associated with relevant actors' relationships to develop actions to influence their behaviors. The JFC's decision-making generates an operational advantage through understanding the security environment.

Required Capability A.3: The Joint Force requires the ability to understand how relevant actors are successful in adapting their use of information technology.

Description. The Joint Force will understand characteristics, dependencies, and vulnerabilities of common technologies and understand their impact on the security environment. The Joint Force gains assistance from embedded technology SMEs, and interorganizational and partner efforts to understand emerging methods and known vulnerabilities of relevant actors. The Joint

Force uses a common method of depicting how relevant actors adapt their use of technological advancements to impact USG objectives. Additionally, the Joint Force will understand the impact of change in the technological aspects of the security environment and their potential for exploitation.

Desired Effect. The Joint Force is able to develop concepts for exploiting technical opportunities in the IE. The Joint Force develops an understanding of technology used to monitor, interrupt, and challenge Joint Force objectives. The Joint Force gains insights to vulnerabilities of its own systems and will take actions to protect its technology and systems.

Required Capability A.4: The Joint Force requires the ability to share contextual understanding of the security environment.

Description. The Joint Force will distribute an updated characterization of relevant actor perceptions, attitudes, and other elements that drive behaviors linked to Joint Force activities. The Joint Force will continue to enhance its understanding of relevant actor motivations and relationships to either support or counter USG interests. The effort to understand relevant actor behavior will gain insight through collaboration with SMEs, partners, allies, and interorganizational analysis. The Joint Force will distribute user-defined visual display formats to foster situational understanding with interorganizational efforts, partners, and allies. To the fullest extent possible, distributed information will be unclassified to maximize the number of potential users. This effort will apply continuous updates to make sense of relevant actors' changing methods and techniques as they adapt their use of new and old technology.

Desired Effect. Joint Force maintains an enhanced understanding of the security environment and relevant actor perceptions, attitudes, and other elements that drive behaviors. The Joint Force is able to make decisions and assessments to anticipate relevant actor behaviors with enhanced clarity and speed.

Required Capability A.5: The Joint Force requires the ability to characterize, assess, synthesize, and understand trends of relevant actor activities and their impacts on the IE throughout cooperation, competition, and conflict.

Description. The Joint Force will assess and explain relevant actor activities, ability to influence others, and the strength or vulnerability of relationships and their likely courses of action. The Joint Force leverages allies, partners, SMEs, and intelligence systems to evaluate how competitors and adversaries use propaganda, disinformation, or active measures. Additionally, the Joint Force will use scientific methods to estimate the most likely motivation for relevant actor courses of action and the likely intent or goal of some actions.

The Joint Force is able to estimate and evaluate the impact and magnitude of friendly and relevant actor actions in the IE on the Joint Force mission.

Desired Effect. The Joint Force uses estimates of future activities by relevant actors to inform concepts of action and response. The Joint Force understands the transregional, multi-domain, multi-functional impacts of friendly and relevant actor actions in the environment. The Joint Force is able to produce a detailed characterization of the IE that identifies and leverages opportunities in order to change or maintain the current conditions of cooperation, competition, and conflict.

Required Capability A.6: The Joint Force requires the ability to analyze and estimate relevant change within the IE.

Description. The Joint Force understands relevant actor behavior, relationships, and use of technical networks in the IE. Develop estimating approach evaluating decision-making models to understand indicators of relevant actor processes and likely results. Multiple dynamic-learning models and approaches contribute to a combined estimate of relevant actor's behavior, relationships, and use of technical networks. The combined estimate will identify some dependencies to indicate interests, intent, capability, and capacity to support or counter USG interests. The estimating efforts will gain inputs from SMEs, partners, allies, and interorganizational analysis. The Joint Force is able to synthesize real-time data inputs to adapt estimating approach. Additionally the Joint Force is able to differentiate between cooperation, competition, and armed conflict as well as understand the range of behaviors among relevant actors associated with competitive or adversarial transitions. The Joint Force will provide a consistent approach to adapt analytic models to the changing environment.

Desired Effect. Estimating efforts depict those likely and dangerous transitions of adversarial or competitive behavior that challenge U.S. objectives. Analytical models are adapted to the changing circumstances of the environment to enable more nuanced depiction of the region or locale. The Joint Force is able to estimate the interests, intent, capability, and capacity of relevant actors to support or counter USG interests.

Required Capability A.7: The Joint Force requires the ability to identify, access, and coordinate IE subject matter expertise.

Description. The Joint Force will integrate a range of expertise to address challenges and opportunities within the IE. The Joint Force will apply SMEs to accurately characterize and understand trends in the environment using SME competencies to assist, complement, and enhance use of automated analysis of the environment to develop potential approaches to known and developing situations.

Desired Effect. The Joint Force recognizes regional and local relevant actors, those who are emerging, and those who are changing their allegiances and behaviors. The Joint Force gains insight to the changing terrain of relevant actors' relationships, capacity, and capability to challenge or support Joint Force objectives. The Joint Force gains access to and develops the appropriate SMEs in military and academia to accurately characterize and forecast the environment and provide potential approaches to known and developing situations.

Required Capability A.8: The Joint Force requires the ability to understand internal and other relevant actor bias within the IE.

Description. The Joint Force assesses and challenges internal individual decision biases and cognitive biases that produce errors in judgment or decision-making. These may include assumptions, prejudices, approaches to information acquisition, learning, and cultural assumptions, which shape perceptions and motivations of the United States, allies, partners, and other relevant actors. The Joint Force should identify how it sees itself and how it sees others. Additionally, the Joint Force should identify how others see themselves and the Joint Force.

Desired Effect. The Joint Force is able to control for internal bias in understanding the IE and OE; and develops situation-based criteria for self-assessment and approaches to mitigate or reduce internal analytical bias. The Joint Force matures a valid understanding of regional and local perceptions, attitudes, and other elements that drive desired behaviors. The Joint Force is able to understand and evaluate relevant actors' interests, capabilities, and capacity to challenge or support Joint Force operations.

Required Capabilities to Formulate Options that Integrate Physical and Informational Power

Required Capability B.1: The Joint Force requires the ability to identify, optimize, and assess the effectiveness of the full range of options that integrate physical and informational power to produce desired psychological effects.

Description. The Joint Force will deliberately design and integrate physical and informational activities to affect perceptions and behaviors, or otherwise achieve desired conditions in the environment. The Joint Force will identify those informational aspects necessary to enhance the psychological effects of physical power. Mission analysis will incorporate human- and system-specific vulnerabilities and exploitation approaches that shape human behavior. The Joint Force will define objectives in terms of the desired and undesired perceptions, attitudes, and other elements that drive behaviors of relevant

actors to establish the common vision, goals, and objectives to achieve unity of effort. The Joint Force will understand and account for constraints, limitations, and restraints based on known political, cultural, and moral factors of the environment. The Joint Force uses the relevant actor narrative to inform operational design. The commander may choose to amplify or mute narrative elements to support his intent to influence individuals and groups for a purpose supporting Joint Force objectives.

Desired Effect. The Joint Force is able to develop methods of changing or sustaining attitudes and other elements that drive desired behaviors. The Joint Force identifies combinations of physical and informational actions that favorably affect environment conditions to mitigate challenges to Joint Force objectives. The Joint Force applies informational power on par with physical power to influence. The Joint Force has more adaptable and responsive courses of action to shape factors of the IE that impact the commander's operation.

Required Capability B.2: The Joint Force requires the ability to employ required forces and capabilities from across the Joint Force to sustain or change perceptions, attitudes, and other elements that drive desired behaviors of relevant actors.

Description. The Joint Force recognizes opportunities to affect perceptions, attitudes, and other elements that drive behaviors of relevant actors to create conditions necessary in the environment. The Joint Force effectively matches capabilities to change or reinforce perceptions, attitudes, and other elements that drive behaviors to create conditions for success. Partners integrate to conduct activities that take advantage of their abilities and authorities to create opportunities that the Joint Force can exploit. The Joint Force identifies, mitigates, and, where appropriate, adjusts or removes policy, geographical, and interorganizational barriers that inhibit the integration of physical and informational power. The Joint Force designs an assessment approach to understand the actual effect of its capabilities on the relevant actor.

Desired Effect. The Joint Force develops the full range of options to integrate physical and informational power. The impact of Joint Force lethality is purposefully enhanced using information to target relevant actor behavior before, during, and after strike operations. The right capability is available at the right time for a suitable period to ensure freedom of action.

Required Capability B.3: The Joint Force requires the ability to assess relevant actors' capability and capacity to receive, understand, and respond to Joint Force physical and informational activities.

Description. The Joint Force assesses the likely impact of planned physical and informational activities on relevant actors. The Joint Force uses technology and SMEs to test developed courses of action and matures its understanding of how and why relevant actors respond to Joint Force physical and informational activities. The Joint Force evaluates, contrasts, and estimates likely costs and benefits of the proposed options. The JFC develops collection and assessment models to support future assessment activities.

Desired Effect. The Joint Force understands appropriate options to influence the behavior of relevant actors and the course of events. The JFC develops collection and assessment models to determine effectiveness of its military (both informational and physical) activities.

Required Capabilities to Execute and Modify Options

Required Capability C.1: The Joint Force requires the ability to execute integrated physical and informational activities designed to achieve psychological effects.

Description. The Joint Force will seize and maintain the initiative over USG competitors and adversaries through the execution of military (both informational and physical) activities to maintain a relative advantage. The Joint Force leverages its knowledge of the environment, technology, and partner capability to apply military power throughout the range of cooperation, competition, and armed conflict to set conditions that lead to enduring, acceptable political outcomes. The Joint Force, in conjunction with the interagency, allies, and partners, will develop and communicate a consistent, credible, and compelling narrative to relevant actors. The Joint Force must use integrated effects terminology with interagency, allies, and partners to strengthen beneficial narratives and provide alternatives to detrimental narratives; e.g., the combined force must have a unified view of effects terms such as isolate and neutralize. The Joint Force will be capable of collecting information on relevant actor perceptions, attitudes, and other elements that drive behaviors to gain an assessment of the level of impact Joint Force activities are having on relevant actors. The Joint Force will evaluate its assessment approach by stimulating the environment to gather responses from relevant actors to gain understanding of the relative influence of individuals and groups.

Desired Effect. Commanders apply informational power at a tempo that equals, and at times exceeds, the application of physical power. The Joint Force is effective in designing effects that shape conditions to achieve strategic and theater campaign objectives. The Joint Force communicates a compelling narrative that influences the behavior of relevant actors. The Joint Force is able to maintain freedom of action in the environment by maximizing time,

space, and force to maintain a relative advantage over competitors and adversaries.

Required Capability C.2: The Joint Force requires the ability to assess and modify informational power with the same level of competency as physical power.

Description. The Joint Force will measure behavioral changes with reliable, consistent indicators and associated measures of effectiveness to understand assessment trends toward mission success or failure. In addition, the Joint Force will be able to determine critical factors and potential causation of trends, and apply that information to modify options for physical and informational activities. This includes the ability to creatively adapt capabilities and integrate partner capabilities during execution to support USG strategic and theater objectives. The Joint Force will modify its activities based on operational assessment feedback and apply intelligence analyses to create rapid prototyped response options to meet Joint Force objectives.

Desired Effect. The Joint Force has the capability and capacity to collect on indicators within the environment, assess progress toward objectives, and interactively share information concerning the environment. The Joint Force modifies how it operates to maintain a relative advantage. The operational assessment effort integrates allies and partners.

Required Capabilities to Institutionalize the Integration of Physical and Informational Power

Required Capability D.1: The Joint Force requires the ability to change how its individuals, organizations, and units think about and treat information.

Description. The Joint Force will establish a mindset through education and training that provides the foundational understanding to leverage information deliberately and the inherent informational aspects of military activities. To set the desired conditions and achieve objectives, military members at all levels must understand that military activities have informational aspects with strategic/operational/tactical impacts. The Joint Force must understand that relevant actors may perceive all activities by the USG and its partners as connected. The Joint Force must attempt to align its activities with its interorganizational partners and allies.

Desired Effect. The integration of physical and informational power becomes an intentional forethought inherent to strategy and operational art. Joint leaders understand how perceptions and attitudes drive behaviors and affect enduring strategic outcomes. The Joint Force defines objectives in terms of the desired perceptions, attitudes, and other elements that drive behaviors of

relevant actors to achieve mission success. The Joint Force frames the objectives to enable interaction among USG agencies toward common goals.

Required Capability D.2: The Joint Force requires the ability to organize, train, equip, and maintain organizations that deliberately leverage information and the informational aspects of military activities.

Description. The Joint Force recognizes and reduces institutional barriers that inhibit its ability to capitalize on the informational aspects of military activities. The Joint Force refines its structures and capabilities based on strategic requirements linked to resourcing. The Joint Force identifies and groups together related capabilities and activities to help JFCs integrate, synchronize, and direct informational power. The Joint Force cooperates with academia, to include collaborative development of curriculum for military education and increased opportunities for advanced civil schooling. The Joint Force unifies its understanding of the distinctions between activities and the intended effects they generate.

Desired Effect. The Joint Force is able to use the "information" joint function on par with C2 and Fires to enable the integration of physical and informational power. The JFCs are able to integrate, synchronize, and direct the military aspects of informational power with interorganizational partners. The Joint Force is able to implement processes, techniques, and tactics that leverage information and the inherent informational aspects of military activities. The Joint Force is able to draw upon required capabilities from across domains, echelons, geographic boundaries, and organizational affiliations to build operationally coherent joint formations.

Required Capability D.3: The Joint Force requires the ability to integrate operations with interorganizational partners.

Description. The Joint Force will educate and train personnel to provide the best military advice regarding information and the inherent informational aspects of military activities to both military and civilian leaders. The Joint Force will articulate the likely advantages and risks of an integrated approach such that leadership can make a more informed decision. The Joint Force will understand coalition and civilian resources for the latest technological advances and techniques of applying information to enhance its current capabilities.

Desired Effect. The Joint Force has sufficient staff personnel available and clear linkages to coordinate with interorganizational partners and academic efforts by both the United States and other nations. The Joint Force establishes the mechanisms that facilitate engagement and promote unity of effort with external partners.

<u>Required Capability D.4</u>: The Joint Force requires the ability to leverage physical and informational power at its discretion to achieve objectives.

<u>Description</u>. The Joint Force informs future policy, authorities, and permissions to enable integrated physical and informational power in pursuit of USG strategic outcomes. Commanders have the proper legal framework, authorities, and permissions to enable a wide range of both rapid and enduring response options. Enable Commanders through all appropriate means to exploit opportunities to emphasize and deemphasize informational aspects of their activities to generate advantages while managing risk appropriately.

<u>Desired Effect</u>. Modified policies, authorities, and permissions provide a greater range of options to act by a broad range of means at lower levels. The Joint Force is educated on informational aspects of military activities and rapidly executes activities and operations. Policy, authorities, and permissions enable the effective and timely integration of physical and informational power.

6. Risks of Adopting this Concept

The following are risks associated with adopting JCOIE. The Central Idea states the Joint Force must: understand information, informational aspects of military activities, and informational power; institutionalize the integration of physical and informational power; and operationalize the integration of physical and informational power through the implementation of the capabilities required by this concept in Section 5.

1. The concept's call for integrating physical and informational power across geographic boundaries and in multiple domains could lead to campaigns and operations with enormous complexity. The fog and friction of war punishes unnecessary complexity, but transregional, multi-domain, and multi-functional campaigns and operations are complex by nature.

2. Congress and other resource allocators could misread the JCOIE's focus on informational power to suggest there is little need for a well-equipped and technologically advanced Joint Force capable of traditional power projection and decisive action.

3. The JCOIE's focus on informational power to achieve effects could be misapplied and overextended to the point it hinders rather than helps joint operations. Operationalization of JCOIE could result in overconfidence in the Joint Force's ability to understand fully relevant actors, when in reality it will never have a perfect understanding.

4. Integrating physical and informational power will likely challenge the boundaries of current national policy. The JCOIE's goal to dissuade conflict or prepare the environment to win decisively may not be attainable if operational commanders do not receive the necessary approval for timely and anticipatory

actions from the Nation's civilian leaders. Without early and preemptive efforts, the Joint Force, along with its partners, will be incapable of averting or diminishing conflict.

5. Interorganizational partners and other government agencies may be unwilling or unable to align and integrate into global operations for various bureaucratic, organizational, legal, cultural, or financial reasons. Should alignment and integration not occur the DoD would have to attempt to fill those gaps.

6. There is a risk of escalation and unintended consequences. The United States could miscalculate how an adversary will perceive and react to our actions in and through the IE, leading to heightened tensions or even conflict.

7. JCOIE implementation could lead to the establishment of programs that expend limited resources without attaining the desired levels of personnel knowledge and overall competency. JCOIE implementation will require fully coordinated and substantially improved and extensive research support on public opinion, media reaction, and cultural factors related to Joint Force information activities.

8. Adoption of JCOIE will require an increase of resources to provide extensive and sophisticated IE training for Joint Force personnel, along with substantive and technical requirements for effective international and intercultural communication. A special effort will be necessary to develop appropriate career tracks and merging some career fields to become multi-functional information professionals to encourage full development of a professional corps. Failure to address Joint Force training will minimize effectiveness of JCOIE implementation.

9. Inadequate resourcing and the need for policy review and clarification will severely affect the Joint Force's ability to realize required capabilities.

10. The JCOIE's focus on the Joint Force's application of informational power could lead to confusion regarding the roles and responsibilities of the military.

11. The JCOIE may result in unauthorized employment of information-related capabilities due to a lack of understanding governing authorities. Access restrictions might prevent the complete understanding of compartmented authorities that is necessary to employ fully those capabilities.

Glossary

For the purpose of this concept, the following definitions are used:

Human Aspects. Human aspects reflect the foundation from which humans interact with other humans and their environment. Physical, social, cultural and physical elements that shape human behavior form the foundation. Likewise, the foundation affects these elements. Character, tradition, and nature are all human aspects that suggest how humans might behave under particular circumstances in the future.

Influence. The power to change or affect someone or something.

Information. A particular arrangement or sequence of things conveys specific information. Information is stimuli that have meaning in some context for its receiver.

Information Environment. The IE is comprised of and aggregates 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.[66]

Informational aspects. Informational aspects are the features and details of activities that an observer interprets and uses to assign meaning. Informational aspects include, but are not limited to timing, platforms, location, and duration. They are the sensory inputs used by individuals, systems, or groups to assign meaning and gain understanding about the world. They reflect the way that individuals, systems, and groups communicate and exchange information.

Informational Power. The ability to leverage information to shape the perceptions, attitudes, and other elements that drive desired behaviors and the course of events. This includes the ability to use information to affect the observations, perceptions, decisions, and behaviors of relevant actors; ability to protect and ensure the observations, perceptions, decisions, and behaviors of the Joint Force; and the ability to acquire, process, distribute, and employ data (information). This helps commanders and staffs incorporate the concept of the *preeminent nature* of information into the design of all operations to maximize military power.

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[66] This definition expands on the current definition of the IE found in Joint Publication 1-02, *DOD Dictionary of Military and Associated Terms*. Defense Technical Informational Center, As of March 2017. The JCOIE Core Team Workshop held at Quantico, 18–19 April 2017 determined that additional wording would help clarify ideas in JCOIE.

Integration of Physical and Informational Power. The deliberate leveraging of information and the inherent informational aspects of military activities to direct or influence the behaviors of relevant actors and the course of events.

Military Activities. The full range of deeds, actions, and functions conducted by or on behalf of the military. This encompasses physical and informational activities such as joint, combined, and exchange training, military information support operations, acquisition programs, civil-military operations, research and development, etc.

Narrative. A basis for unified communication and understanding that creates meaning through a system of story formats, which draws upon local history, culture, and religion to frame and affect the perceptions of specific actions.[67] Narratives display an individual's or group's worldview, goals of group leadership, sense of power or oppression, claims of legitimacy, description of enemies, and other characterizations useful to understanding relevant actors and their actions.[68] Effective use of narratives can shape behaviors and even transform culture.[69]

Physical Aspects. Physical aspects are the material characteristics, both natural and manufactured, of the environment that create constraints and freedoms on the people and information systems that operate in it. Physical aspects are critical elements of group identity and frame how tribes and communities form. Additionally, physical aspects enhance or inhibit how people exchange information.

Physical Power. The means to use force to direct or influence the behaviors of others and the course of events.

Psychological Effect. The impact on one or more of the four basic psychological processes of memory, perception, emotion, and decision-making.

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[67] Paruchabutr, Gittipong. *Understanding and communicating through narratives*. Thesis. School of Advanced Military Studies, 24 May 2012.

[68] Mark Laity describes narrative as "more than just a story. Rather, a narrative contains many stories, and—more importantly—it is an explanation of events in line with an ideology, theory, or belief, and one that points the way to future actions." He goes on to say "Narratives make sense of the world, put things in their place according to our experience, and then tell us what to do." Bishop, Donald M. *Quotable: Mark Laity on Russia, Operationalized Use of Information, and Narrative*. Washington DC: Public Diplomacy Council. 15 October 2015. Web. http://www.publicdiplomacycouncil.org/commentaries/10-15-15/quotable-mark-laity-russia-operationalized-use-information-and-narrative

[69] Dr. Laura Steckman describes narratives as powerful stories that make sense of the past and project to the future. They contain the requisites for all stories, but are more than simple stories.

Relevant Actors. 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.[70] These relevant actors may include governments at the national and sub-national levels; state security forces, paramilitary groups, or militias; non-state armed groups; local political, religious, civil society, media, and business figures; diaspora communities; and global/regional intergovernmental and non-governmental organizations. Law or policy may further limit the definition of relevant actors at the time of the proposed operation.

Security Environment. A global composite of the conditions, circumstances, and influences OEs that affect the employment of the U.S. military.[71]

Worldview. A mental model of reality—a framework of ideas and attitudes. The beliefs, values, and behaviors of a culture stem directly from its worldview. An observer's worldview frames the informational aspects of physical and socio-cultural activities to assign meaning.

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[70] Definition modified from definition provided in *Joint Concept for Human Aspects of Military Operations Transition Plan* to include automated processes and systems. *Joint Concept for Human Aspects of Military Operations.* 19 Oct. 2016. Web. http://nsiteam.com/joint-concept-for-human-aspects-of-military-operations-jc-hamo/

[71] Inferred this description from the security environment discussions found in JP 1, "Doctrine for the Armed Forces of the United States."

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