

Soldiers assigned to Bravo Company, 1<sup>st</sup> Battalion, 77<sup>th</sup> Armor Regiment, 4<sup>th</sup> Armored Brigade Combat Team, 1<sup>st</sup> Armored Division, provide security with a M109A6 Paladin prior to reconnaissance patrol during Decisive Action Rotation 14-10 at National Training Center at Fort Irwin, California, September 24, 2014 (U.S. Army/Richard W. Jones, Jr.)



# Wargaming the Third Offset Strategy

By Paul Norwood and Benjamin Jensen

**A**t a November 2014 keynote address at the Reagan National Defense Forum, then-Secretary of Defense Chuck Hagel announced the Defense Innovation Initiative (DII) to develop “a game-changing Third Offset Strategy.”<sup>1</sup> Just as the First Offset (introduction of nuclear weapons) and the Second Offset (emer-

gence of precision strike) gave the U.S. military significant advantages, a new series of technological building blocks will sustain American military dominance.<sup>2</sup> In a December 2015 speech, Deputy Secretary of Defense Robert Work envisioned a future in which autonomous deep learning systems (artificial intelligence), human-machine

collaboration, human-assisted operations, combat teaming (robotics), and autonomous weapons will give U.S. forces a competitive advantage.<sup>3</sup>

To date, much of the Third Offset discussion has focused on technology. To support the initiative, Undersecretary of Defense for Acquisition, Technology, and Logistics Frank Kendall convened a new long-range research and development planning program. Of note, Kendall helped implement the second offset through his work on follow-on forces attack capabilities in the late 1980s. Similar to the institutional processes that drove the Second Offset Strategy, the Third Offset appears to prioritize developing and integrating revolutionary technologies that have the potential to change how actors fight wars.

New capabilities require new operating concepts. Just as carrier aviation in the 1920s benefited from the tactical-and operational-level wargames held at

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the Naval War College, the Third Offset Strategy would benefit from experimentation through a series of wargames connected to joint professional military education (JPME) and field/fleet exercises. Unlike earlier top-down efforts, this new experimentation and conceptual development campaign should harness the power of crowdsourcing and incorporate ideas from across the Services, academia, and the private sector to develop what Secretary Work refers to as “AirLand Battle 2.0.”<sup>7</sup>

This article lays out an approach for developing new joint concepts for the Third Offset Strategy. First, the article defines offsets and their importance in military theory. Next, the analysis shifts to assessing the role of wargames in developing military concepts. Finally, the article proposes a wargaming campaign to develop new joint concepts for the strategy.

## What Are Offsets?

Offsets are investments in new capabilities that maintain relative force superiority. The idea emerges from applying the classical economic concept of comparative advantage to long-term competitive defense strategies. Offsets match strengths to weaknesses. Put simply, you want to find an investment that maximizes your strengths and efficiencies while offsetting those of an opponent. For example, according to former Secretary of Defense Harold Brown, one of the architects of the second offset, “if the United States looks for comparative advantages against a potential Soviet adversary with superior numbers of forces, one of the most obvious is the relatively lower cost of incorporating high technology into U.S. military equipment.”<sup>8</sup>

Through the DII, the Third Offset seeks “specific investments in promising new technologies and capabilities such as high-speed strike weapons, advanced aerodynamics, rail guns and high-energy lasers.”<sup>9</sup> In addition to these new technologies, the strategy involves using “current capabilities in new and creative ways—like adapting our Tomahawk missiles to be used against moving targets in

a maritime environment, or using smart projectiles that can be fired from many of our existing land- and ship-based artillery guns to defeat incoming missiles at much lower cost per round.”<sup>10</sup>

Yet the question becomes how to integrate these potential offset technologies into joint and Service operating concepts such as the new U.S. Army Operating Concept *Win in a Complex World*.<sup>11</sup> For example, the concept uses focus areas and first principles to guide the acceleration of new technologies into the force. Instead of searching for technological silver bullets, the U.S. Army uses focus areas, such as mobile protected precision firepower and situational understanding, to develop concepts for achieving overmatch on a 21<sup>st</sup>-century battlefield.

There are several ways offsets could be applied to deter adversaries and assure allies in the contemporary operating environment. The Third Offset could be part of a cost-imposing concept designed to achieve limited objectives in peacetime great-power competition.<sup>12</sup> Such a move would parallel important Cold War cases, including the U.S. Air Force’s development of new bomber concepts to penetrate Soviet defenses as a means of increasing the amount of Warsaw Pact resources spent on air defense.<sup>13</sup> Alternatively, the Third Offset technologies could be integrated into a denial concept that seeks to convince the enemy it is costly to accomplish their objective.<sup>14</sup> For example, Chinese and Russian investments in antiaccess/area-denial capabilities can be thought of as a larger effort to deny U.S. power projection.<sup>15</sup>

It is not only technology but also how new capabilities are employed that produces military power.<sup>16</sup> A new capability is more than just a new technology. It requires new concepts for employing the systems and training on how to operate them as part of a larger joint fight. The strategy is unlikely to reach its full potential until the joint community develops new operating concepts.

## Wargaming as Experimentation

The Department of Defense should pursue a joint wargaming initiative designed to generate new concepts

around the proposed offset technologies. Wargames serve as a time-tested mechanism for generating new ideas about warfare.<sup>17</sup> These ideas can then be tested through further analysis and field and fleet experiments.

Wargaming is “a representation of military activities, using rules, data, and procedures, not involving actual military forces, and in which the flow of events is affected by, and in turn affects, decisions made during the course of those events by players acting for the actors, factions, factors and frictions pertinent to those military activities.”<sup>18</sup> Within this broad continuum, analytical wargaming is the use of competitive scenarios designed to further understand the changing character of warfare and enable future planning.<sup>19</sup> These games provide their players, usually military officers and civilian defense officials, with “decision-making experience and decision-making information.”<sup>20</sup>

There is a long history of using wargaming to develop new tactics and operating concepts in the profession of arms. Prior to World War I, German Field Marshal Alfred Graf von Schlieffen used a combination of wargames and field exercises to test operating concepts.<sup>21</sup> During the interwar period, the U.S. Navy used the Naval War College to generate new ideas about fleet tactics and employing emerging capabilities like aircraft carriers.<sup>22</sup> These experiments connected the schoolhouse and the fleet. In 1925, Admiral Joseph Reeves moved from heading the tactics department at the Naval War College, where he used wargaming to develop new concepts for carrier aviation, to commanding the USS *Langley*, an experimental carrier.<sup>23</sup> U.S. Army General Donn Starry used a series of corps-level wargames and simulations on the “central battle” in the Fulda Gap to stress test the Active Defense doctrine and develop the conceptual foundation of AirLand Battle.<sup>24</sup> The Office of Net Assessment used a series of seminar-based wargames to develop creative ideas for harnessing the power of precision strike throughout the 1980s and 1990s.

There is a new interest in the use of wargaming to generate new operating

concepts. Secretary Work and General Paul Selva, USAF, have called for a new era of wargaming to prepare for future wars.<sup>22</sup> The RAND Corporation has opened a Center for Gaming to explore new approaches to national security challenges.<sup>23</sup> Through the Brute Krulak Center, the Marine Corps University is reintroducing competitive wargames into JPME to develop creative problem-solving techniques and explore the changing character of war.<sup>24</sup> Paralleling these efforts, American University's School of International Service is exploring how to use games as a means of helping students consider new solutions to global challenges ranging from climate change to complex humanitarian emergencies and mass migration.

There are best practices associated with analytical wargames used to develop new concepts.<sup>25</sup> First, games need multiple parties engaged in a competitive struggle, which facilitates creativity and new approaches. Second, the games should be set in realistic scenarios that have uncertainty, risk/reward dynamics, and different objectives for the actors. According to Williamson Murray and Macgregor Knox, "Every major cluster of innovations during the interwar period that resulted in a revolution in military affairs . . . depended on the existence of concrete adversaries against which to frame innovation."

Third, the games have to be recorded and the decision calculus tracked in order to facilitate discussion about options. These observations enable a robust dialogue after the game, encouraging critical reflection on the nature and character of war. Games should start conversations, not end them.

Fourth, the games should clearly distinguish between tactical engagements and operational-level campaigns.<sup>26</sup> Tactical games help participants learn how to use a new capability in a battle. Operational-level games help participants situate campaign-level objectives and determine which options are available, given a new capability. For example, would the introduction of rail guns on multiple classes of surface combatants and forward-deployed artillery

units alter campaign objectives or simply increase the joint force's effectiveness in reaching existing objectives? Do new capabilities open up entirely new objectives and lines of effort in the campaign planning process?

Fifth, the game designers need to choose the format that best facilitates concept development. There are four types of analytical wargames: seminar, matrix, free *kriegsspiel* (German for "wargame"), and rigid *kriegsspiel*.<sup>27</sup> Seminar games and matrix games are loosely structured and focus on allowing the participants to interpret events. *Kriegsspiel* descends from a Prussian game used to train operational and tactical decisionmaking. Applied to modern wargaming, free and rigid *kriegsspiels* imply analytical games with a more structured rule set. These rules could be based on everything from force-ratio calculations to the limits of certain weapons systems or allied preferences. Unlike seminar and matrix games, these rules are established in advance as opposed to interpreted and debated.

To develop a modern joint concept, wargames must specify a military problem in the context of a clear political objective and provide a forum in which practitioners can imagine a wide range of possible solutions. A concept is a "description of a method or scheme for employing specified military capabilities in the achievement of a stated objective or aim."<sup>28</sup> Joint concepts "examine military problems by describing how the Joint Force, using military art and science, may conduct joint operations, functions, and activities in response to a range of future challenges."<sup>29</sup> For former Chairman of the Joint Chiefs of Staff General Martin Dempsey, USA, concepts "inform our ideas and sharpen our thinking as we determine how to meet the requirements laid out in . . . defense strategic guidance."<sup>30</sup> They are the central ideas that evolve through deliberation into doctrine.<sup>31</sup>

Rigid bureaucracies like military organizations require arenas outside the normal chain of command in which to develop new ideas about fighting war.<sup>32</sup> Wargames provide one such forum,

enabling a wide range of officers, as practitioners, to investigate new ways of solving an emerging military challenge in relation to stated national interests and joint objectives. Game design should capture "the identification and refinement of a joint military problem, a proposed operational solution, and the capabilities required to implement the proposed solution."<sup>33</sup> Participants assume a competitive role in this environment and test new ideas from operational solutions to new capabilities.

## Wargaming Offsets

The Third Offset is a central idea in U.S. military thought that should be tested through broad-based wargaming efforts that create a vibrant marketplace of ideas. First, the wargames should be structured in a manner that recreates the interwar loop at the Naval War College.<sup>34</sup> There should be a dialogue between the Joint Staff, Services, and researchers in JPME-granting institutions about the future of war. This dialogue should be rooted in an active research program, thereby implying a requirement for more rigorous publication standards for JPME-granting institutions, and should integrate students. Major research universities incorporate graduate students into their investigations, and the same should be true for JPME-granting institutions that also offer accredited graduate degrees. The officers in attendance, typically field grade officers, have the types of tactical-level insights and recent battlefield experiences that make games more realistic.

The schoolhouses could become hothouses of ideas, sites where officers engage in research and take ownership of the ideas that will become future doctrine. Such a move would require a significant shift to current curriculum development approaches in JPME institutions. Curriculum is often over-prescribed based on the requirements of the Chairman of the Joint Chiefs of Staff, Officer Professional Military Education Policy, and host institution instructions.<sup>35</sup> JPME institutions often do not teach the graduate-level historical or social science research methods



Electromagnetic Railgun launches projectiles using electricity instead of chemical propellants for use aboard ships, June 21, 2012  
(U.S. Navy/John F. Williams)

required to help their students develop and test new ideas, as concepts, about future warfare.<sup>36</sup> As a result, many schools have difficulty producing space in the curriculum to develop and test new operating concepts.

Two institutions are taking steps to remedy the current state of affairs, however. The U.S. Army War College is seeking to link research faculty and students to current strategic priorities of the Chief of Staff of the Army and the larger joint community. In September 2015, the college designed and played a wargame for the U.S. Army G3/5/7. Played by a mix of students and technical experts, the game explored future modernization options for mission command networks. The game designers used the principles of the Army Operating Concept to evaluate each player's moves. Through a partnership between the Army War College and the Army Capabilities Integration Center (ARCIC), senior Service college students help design the future force as part of the annual Unified Quest wargame. ARCIC is also exploring the use of online gaming

environments to conduct virtual maneuvers in order to assess prototypes.<sup>37</sup>

The Marine Corps University, through the Brute Krulak Center and the Advanced Studies Program, is connecting students writing their master's theses with defense partners such as U.S. European Command and the Marine Corps Warfighting Lab in focused research lines linked to ongoing concept development. For example, in 2015 students researched the future of warfighting in a megacity and tested their concepts through seminar-style wargames. Though promising, these initiatives should be funded and connected to joint concept development in a more deliberate manner that incentivizes civilian faculty and JPME students to collaborate on developing new concepts to test ideas like the Third Offset through forums such as wargames.

Second, the joint community should take ideas developed in wargaming the Third Offset in schoolhouses and crowdsource them. There is a new interest in crowdsourcing and predictive marketplaces in businesses and the Intelligence

Community.<sup>38</sup> Crowdsourcing implies harnessing the diversity of perspectives in large populations to enhance decisionmaking. Each individual has a different piece of information that could aid in making a decision. Collecting and comparing these different viewpoints increases the chances of being correct about the future. The process also helps leaders identify "zombies," capability investments that are no longer relevant on the modern battlefield.<sup>39</sup>

Applied to wargaming the Third Offset, the joint concept development community should take the concepts developed at schoolhouses and in operational units and test and refine them through crowdsourcing. Using a variety of unit-level exercises would provide a higher level of fidelity to experimentation and help the military spot innovative leaders. For example, a low-cost means to tap into the wisdom of crowds would be to task every Army brigade to submit a Third Offset-related new concept, organizational change, or technological improvement that would fundamentally

change the way they operate. As the ideas are vetted, the Army could identify bright tactical-level officers and noncommissioned officers who are comfortable with innovating. In the words of key AirLand battle architect General Starry, the Army should find the “professional visionaries and malcontents”<sup>40</sup> with an aptitude for experimentation and tactics who could be groomed for future leadership positions. This group of innovators could then be put to work in a variety of settings, such as U.S. Army Training and Doctrine Command (for example, ARCIC wargames), the Joint Staff (for example, studies and war plans), and the Office of the Secretary of Defense (for example, the Office of Net Assessment and the Defense Innovation Unit Experimental in Silicon Valley). These efforts could build a tactical cascade of innovative behavior that can serve as a guide to new overarching doctrine that applies Third Offset technological advances.

The crowd could expand beyond the military to include social scientists and historians in civilian academic institutions and the private sector. The general public could even participate in unclassified forums via platforms such as Amazon’s Mechanical Turk, which allows random users to answer survey questions.<sup>41</sup> At a minimum, the concepts could be refined into operational and tactical decision games distributed across the force, allowing rank and file members of the joint community to weigh in.

There is an emerging precedent for crowdsourcing in the national security arena. The Chief of Naval Operations Rapid Innovation Cell puts out an annual call for new ideas across the Department of the Navy.<sup>42</sup> In 2015, the Department of Defense, the Department of State, and the U.S. Agency for International Development launched the Defense, Diplomacy, and Innovation Summit in search of new approaches to interagency collaboration from all ranks in each institution.<sup>43</sup> Crowdsourcing has also been applied to massive online wargaming through the Office of Naval Research–sponsored Massive Multiplayer Online Wargame Leveraging the Internet, hosted by the Naval Postgraduate School.<sup>44</sup>

Through the Force 2025 Maneuvers, the U.S. Army conducts “wargaming, exercises, experiments, evaluations, and other efforts focused on determining how the Army organizes and designs the force.”<sup>45</sup> These initiatives include maintaining Wiki-type Web sites where Soldiers and civilians can comment on ongoing Army warfighting challenges.<sup>46</sup>

In practice, this approach to wargaming the Third Offset implies the following. First, the joint concept community would collaborate with JPME institutions to design games that introduce Third Offset capabilities in campaigns linked to current war plans. Students playing these games would then work with faculty to develop research initiatives on new concepts. These concepts, as solution sets to the military problem in the game, would then be crowd-sourced and stress-tested across a larger community. Parallel experimentation would occur in tactical units, creating a competitive marketplace of ideas. Such an approach has the potential to reinvigorate JPME institutions and develop leaders of future military thought.

## Conclusion

To maintain its long-term competitive advantage, the U.S. military is pursuing a Third Offset Strategy. To integrate capabilities ranging from rail guns and high-energy lasers to big data and artificial intelligence and robotics, however, the joint force needs to usher in a new era of conceptual experimentation. The next joint concept should emerge through wargaming proposed offset capabilities. These analytical forums would allow the larger national security community to assess a broad range of alternative future operating concepts and force structures.

Officers should take an active role and imagine future battlefields as part of their JPME experience and field exercises, learning to analyze the art and science of military practice. The joint community can work with the individual Services and integrate Third Offset wargames with JPME curriculum. Officers and the civilian academics who work in JPME should be incentivized to research and

critique alternative operating concepts that emerge from the wargames.

Pursued along these lines, the net benefit of wargaming the Third Offset could well be to empower a new generation of military leaders to take ownership of intellectual development in the profession of arms. The operational tempo over the last 14 years and the reliance on government civilians and contractors has led to a situation in which fewer and fewer officers publish their ideas on warfare. Wargames integrated with JPME curriculum and field exercises could provide a forum for generating new ideas and a spirit of reasoned debate about future war. The joint doctrine community has yet to coalesce around an AirLand Battle 2.0 or AirSea Battle 2.0. Aggregating Third Offset–focused wargames and tactical experiments can start this process and provide a means of finding candidates for future joint doctrine while avoiding costly dead ends. JFQ

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## Notes

<sup>1</sup> Chuck Hagel, keynote address at Reagan National Defense Forum, Simi Valley, CA, November 15, 2014, available at <[www.defense.gov/News/Speeches/Speech-View/Article/606635](http://www.defense.gov/News/Speeches/Speech-View/Article/606635)>.

<sup>2</sup> Robert Work, convocation speech delivered at National Defense University, Washington, DC, August 5, 2014, available at <[www.defense.gov/News/Speeches/Speech-View/Article/605598](http://www.defense.gov/News/Speeches/Speech-View/Article/605598)>.

<sup>3</sup> Robert Work, speech at the Center for a New American Security, December 14, 2015, available at <[www.cnas.org/transcripts/work-remarks-national-security-forum#.Vp1NyzbUjyM](http://www.cnas.org/transcripts/work-remarks-national-security-forum#.Vp1NyzbUjyM)>.

<sup>4</sup> Robert Work, speech at U.S. Army War College Strategy Conference, Carlisle Barracks, PA, April 8, 2015, available at <[www.defense.gov/News/Speeches/Speech-View/Article/606661](http://www.defense.gov/News/Speeches/Speech-View/Article/606661)>.

<sup>5</sup> Paul Norwood and Benjamin Jensen, “How the U.S. Army Remains the Master of Landpower,” *War on the Rocks*, October 1, 2015, available at <<http://warontherocks.com/2015/10/how-the-u-s-army-remains-the-master-of-landpower/>>.

<sup>6</sup> Ashton Carter, Submitted Statement to the Senate Appropriations Committee–Defense on the Fiscal Year 2016 Budget Request for the Department of Defense, May 6, 2015, available at <[www.appropriations.senate.gov/imo/media/doc/hearings/050615%20Secretary%20](http://www.appropriations.senate.gov/imo/media/doc/hearings/050615%20Secretary%20)>.

Carter%20Testimony%20-%20SAC-D.pdf>.

<sup>7</sup> Ibid.

<sup>8</sup> U.S. Army Training and Doctrine Command (TRADOC) Pamphlet 525-3.1, *The U.S. Army Operating Concept: Win in a Complex World, 2020–2040* (Fort Eustis, VA: TRADOC, October 2014).

<sup>9</sup> Thomas Mahnken, *Cost-Imposing Strategies: A Primer* (Washington, DC: Center for a New American Security, November 2014), 6.

<sup>10</sup> Ibid., 10–11.

<sup>11</sup> A. Wess Mitchell, “The Case for Deterrence by Denial,” *The American Interest*, August 12, 2015, available at <[www.the-american-interest.com/2015/08/12/the-case-for-deterrence-by-denial/](http://www.the-american-interest.com/2015/08/12/the-case-for-deterrence-by-denial/)>.

<sup>12</sup> Andrew Krepinevich, Barry Watts, and Robert Work, *Meeting the Anti-Access and Area-Denial Challenge* (Washington, DC: Center for Strategic and Budgetary Assessments, 2003), 13.

<sup>13</sup> Stephen Biddle, *Military Power: Explaining Victory and Defeat in Modern Battle* (Princeton: Princeton University Press, 2004).

<sup>14</sup> For an overview of the history of wargaming, see Davy Banks, *Analytical Wargaming: An Overview*, School of International Service Working Paper (Washington, DC: American University, 2015); Peter P. Perla, *The Art of Wargaming: A Guide for Professionals and Hobbyists* (Annapolis, MD: Naval Institute Press, 1990); Martin van Creveld, *Wargames: From Gladiators to Gigabytes* (Cambridge: Cambridge University Press, 2013); and Philip Sabin, *Simulating War: Studying Conflict through Simulation Games* (London: Continuum International Publishing Group, 2012).

<sup>15</sup> Perla; Banks, 2.

<sup>16</sup> Banks, 2.

<sup>17</sup> Francis J. McHugh, *Fundamentals of War Gaming*, 3<sup>rd</sup> ed. (Washington, DC: U.S. Government Printing Office, 1966), 1–10.

<sup>18</sup> Perla, 41.

<sup>19</sup> Michael Vlahos, *The Blue Sword: The Naval War College and the American Mission, 1919–1941* (Newport, RI: Naval War College Press, 1980).

<sup>20</sup> Jan van Tol, “Military Innovation and Carrier Aviation—An Analysis,” *Joint Force Quarterly* (Autumn/Winter 1997–1998), 102.

<sup>21</sup> Benjamin Jensen, *Forging the Sword: Doctrinal Change in the U.S. Army* (Palo Alto, CA: Stanford University Press, 2016).

<sup>22</sup> Robert Work and Paul Selva, “Revitalizing Wargaming Is Necessary to Be Prepared for Future Wars,” *War on the Rocks*, December 8, 2015, available at <<http://warontherocks.com/2015/12/revitalizing-wargaming-is-necessary-to-be-prepared-for-future-wars/>>.

<sup>23</sup> RAND Center for Gaming, available at <[www.rand.org/capabilities/methods-centers/gaming.html](http://www.rand.org/capabilities/methods-centers/gaming.html)>.

<sup>24</sup> Marine Corps University Brute Krulak Center, available at <[www.mcu.usmc.mil/cac/SitePages/CAC.aspx](http://www.mcu.usmc.mil/cac/SitePages/CAC.aspx)>.

<sup>25</sup> Banks, 9.

<sup>26</sup> Dale C. Eikmeier, “Waffles or Pancakes? Operational- versus Tactical-Level Wargaming,” *Joint Force Quarterly* 78 (3<sup>rd</sup> Quarter 2015), available at <<http://ndupress.ndu.edu/JFQ/Joint-Force-Quarterly-78/Article/607625/waffles-or-pancakes-operational-versus-tactical-level-wargaming/>>.

<sup>27</sup> Banks, 10; Phillip E. Pournelle, “Improving Wargaming in DOD,” PowerPoint presentation at Connections Wargaming Conference, 2015, available at <<http://connections-wargaming.com/agenda/>>.

<sup>28</sup> John Schmidt, “A Practical Guide for Developing and Writing Military Concepts,” Defense Adaptive Red Team Working Paper 02-4, December 2002, available at <[www.au.af.mil/au/awc/awcgate/writing/dart\\_pager\\_writing\\_mil\\_concepts.pdf](http://www.au.af.mil/au/awc/awcgate/writing/dart_pager_writing_mil_concepts.pdf)>.

<sup>29</sup> Chairman of the Joint Chiefs of Staff Instruction (CJCSI) 3010.02D, *Guidance for Development and Implementation of Joint Concepts* (Washington, DC: The Joint Staff, November 22, 2013), A-1, available at <[www.dtic.mil/doctrine/concepts/cjcsi3010\\_02d.pdf](http://www.dtic.mil/doctrine/concepts/cjcsi3010_02d.pdf)>.

<sup>30</sup> *Capstone Concept for Joint Operations, Joint Force 2020* (Washington, DC: The Joint Staff, September 10, 2012), available at <[www.dtic.mil/doctrine/concepts/ccjo\\_joint-force2020.pdf](http://www.dtic.mil/doctrine/concepts/ccjo_joint-force2020.pdf)>.

<sup>31</sup> For an overview on the relationship between concepts and doctrine, see Jensen, *Forging the Sword*.

<sup>32</sup> Benjamin Jensen, “Escaping the Iron Cage: The Institutional Foundations of FM 3-24 Counterinsurgency Doctrine,” *Journal of Strategic Studies* 160, no. 6 (2015); Jensen, *Forging the Sword*.

<sup>33</sup> CJCSI 3010.02D, A-1.

<sup>34</sup> For an overview of this time period, see Vlahos.

<sup>35</sup> CJCSI 1800.01E, *Officer Professional Military Education Policy* (Washington, DC: The Joint Staff, May 29, 2015), available at <[www.dtic.mil/doctrine/education/officer\\_JPME/cjcsi1800\\_01e.pdf](http://www.dtic.mil/doctrine/education/officer_JPME/cjcsi1800_01e.pdf)>.

<sup>36</sup> Celestino Perez, “Strategic Discontent, Political Literacy, and Professional Military Education,” *The Strategy Bridge*, January 14, 2016, available at <[www.thestrategybridge.com/the-bridge/2016/1/7/strategic-discontent-political-literacy-and-professional-military-education](http://www.thestrategybridge.com/the-bridge/2016/1/7/strategic-discontent-political-literacy-and-professional-military-education)>.

<sup>37</sup> To support these initiatives, the Army Capabilities Integration Center sponsored a RAND study titled *Utilizing Gaming Environments to Explore New Operational Concepts* (Santa Monica, CA: RAND, forthcoming).

<sup>38</sup> For an overview, see James Surowiecki, *The Wisdom of the Crowd* (New York: Anchor, 2005); and Philip Tetlock, *Superforecasters: The Art and Science of Prediction* (New York: Crown, 2015).

<sup>39</sup> The concept of zombie projects, prior innovations that are no longer relevant and hold back organizations in terms of resources, emerges from business literature. See Scott An-

thony, David Duncan, and Pontus M.A. Siren, “Zombie Projects: How to Find Them and Kill Them,” *Harvard Business Review*, March 4, 2015, available at <<https://hbr.org/2015/03/zombie-projects-how-to-find-them-and-kill-them>>.

<sup>40</sup> Lewis Sorley, ed., *Press On! Selected Works of General Donn A. Starry, Volume 1* (Fort Leavenworth, KS: U.S. Combined Arms Center, Combat Studies Institute, September 2009).

<sup>41</sup> For an overview of the program, see the Amazon Web site at <[www.mturk.com/mturk/welcome](http://www.mturk.com/mturk/welcome)>.

<sup>42</sup> Chief of Naval Operations, Rapid Innovation Cell, available at <[www.navy.mil/submit/display.asp?story\\_id=85177](http://www.navy.mil/submit/display.asp?story_id=85177)>.

<sup>43</sup> Secretary of Defense, Memorandum on Department of Defense Participation in the October 2015 Defense, Diplomacy, and Development Innovation Summit Pitch Challenge, September 11, 2015, available at <[www.tradoc.army.mil/FrontPageContent/Docs/D3Pitch-Challenge.pdf](http://www.tradoc.army.mil/FrontPageContent/Docs/D3Pitch-Challenge.pdf)>.

<sup>44</sup> Naval Postgraduate School, Massive Multiplayer Online Wargame Leveraging the Internet, available at <<https://portal.mmmowgli.nps.edu/game-wiki/-/wiki/PlayerResources>About%20MMOWGLI>>.

<sup>45</sup> U.S. Army Capabilities Integration Center, *Force 2025 Maneuvers White Paper* (Fort Eustis, VA: TRADOC, January 23, 2014), available at <[www.arcic.army.mil/app\\_Documents/USArmy\\_WhitePaper\\_Force-2025-Maneuvers\\_23JAN2014.pdf](http://www.arcic.army.mil/app_Documents/USArmy_WhitePaper_Force-2025-Maneuvers_23JAN2014.pdf)>.

<sup>46</sup> Army Warfighting Challenges, available at <[www.arcic.army.mil/Initiatives/army-warfighting-challenges.aspx](http://www.arcic.army.mil/Initiatives/army-warfighting-challenges.aspx)>.