

# **Chapter 1. Theories and determinates of military innovation**

What is military innovation, and how, when, and why does it occur? There are a number of conflicting theories that explain military innovation. Does it occur from the bottom-up or the top-down? Does it occur due to external influences, or is it primarily internally driven? Which factors are particularly important for facilitating innovation in war? How significant a role, if any, does a leader play in innovation? This chapter summarizes the answers to these questions using the fields of social science, military history, and organizational theories.

This chapter is divided into two sections. The first discusses existing definitions for innovation, their shortcomings, and concludes with an introduction of the definition that will be used in this study and how it remedies those deficiencies. The second section reviews the literature and presents the dominant theories and determinates of innovation. It starts with a summary of the dominant factors that influence innovation. Next, role of leadership on innovation is reviewed. It is followed by a summary of the various schools of thought on military innovation: civil-military, interservice, intraservice, cultural, principal-agent, and bottom-up. The chapter concludes with a review of the innovation process.

## **1.1. Defining military innovation**

Defining *innovation* is not an easy task. One of the challenges is to distinguish innovation from invention, change, or adaptation. Thus, it should not come as a surprise that the word *innovation* consistently ranks in the top ten percent of all words looked up on Merriam-Webster.com.<sup>1</sup> This section summarizes existing definitions of innovation and addresses the

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<sup>1</sup> Merriam-Webster bases the popularity of words on definition searches on its website over the past seven days. On searches conducted in March and April 2013, *innovation* ranked in the top 1%; it was the 145<sup>th</sup> most popular on

Seeded Content – **Contemporary American Military Innovation: The Challenge of Fighting Today's War While Preparing to Win the Next War** - by Carlton G. Haelig  
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The United States military continues to focus on planning and innovating to fight and win the next major war. The military, however, has been engaged in near constant low-intensity conflicts (LICs) for the better part of twenty years. Their minimal experience with major contemporary warfare is grounded in theory and assumptions. Operational preoccupation with LICs has undermined their ability to test and evaluate many of the major innovations being developed for use in a major war against realistic limitations. This challenge is further compounded by the rapid pace of technological advancement and the growing uncertainty surrounding what a major near-peer conflict would look like.

Military officials and civilian decision-makers must understand the challenges inherent to innovating for the contemporary security environment and innovate accordingly. A failure to acknowledge the uncertainty of a future near-peer conflict may result in misguided innovations and a flawed confidence in existing innovations whose effectiveness has only been proven in LIC environments. It would be a mistake to develop hyper-specific innovations based upon a specific vision of what future warfare will look like. The best course of action is to develop rapidly adaptable innovations based upon timely reassessments of the changing security environment.

For nearly two decades the United States has been engaged in near constant asymmetric counterinsurgency (COIN) and counterterrorism (CT) operations. The continued operational preoccupation of the United States military in these low-intensity conflicts (LICs), however, has had little observable impact on the pace or direction of American military innovation. Despite the current operational focus toward ongoing COIN and CT operations, the United States' major military planning and innovation programs continue to focus on fighting and winning a major conventional war against a near-peer adversary.<sup>[1]</sup>

It is imperative to question whether innovating for the *next* war while fighting the current war dooms the United States to failure. The conflict environment that the United States has experienced since 2001 does not offer the operational conditions needed to sufficiently measure the effectiveness of innovations developed for major near-peer warfare. This makes assessing their effectiveness in the intended conflict

environment difficult, if not impossible, to accomplish. Beyond the inherent difficulties caused by the divergent conflict environments is the inability of defense planners to accurately predict what the next major near-peer war would look like.<sup>[2]</sup> The operational superiority created by the information-rich, net-centric driven warfare that defines contemporary military innovations could be significantly reduced in the opening exchanges of a near-peer confrontation. Such hypotheticals, however, have not—and cannot—be evaluated in the current operational environment.

Despite the apparent dangers of this current trend, major military innovations continue to be developed for fighting major conventional wars. Of the \$183.9 billion requested for Defense Department acquisition programs in FY2017, \$72.7 billion is directed at major defense acquisition programs (MDAPs).<sup>[3]</sup> These programs disproportionately represent the big-ticket, technology-driven innovations and adaptations that are intended to fight *and win* the next major war.<sup>[4]</sup> While many of these recent innovations have been utilized in combat situations with great success, they have not been exposed to the combat environment they are ultimately designed to operate within.<sup>[5]</sup>

The current situation presents a dilemma for military planners and analysts that is two-fold. On the one hand, major innovations in military doctrine and technology are being developed for application to a conflict environment entirely unlike the one in which they are currently being deployed—complicating the ability to effectively test and evaluate them against the objectives and limitations of their intended applications. On the other hand, the rapidity with which technology continually changes the perception of what a future war would look like complicates the ability of defense planners to conceive what innovations are needed or even what a future conflict would look like. Thus it is possible that the United States is preparing for the *wrong* war.

This paper seeks to understand the impact of long-term operational preoccupation with LICs on America's capacity to fight and win the major near-peer wars for which it continues to plan, develop, and implement new military innovations. For all the time and money spent on research, development, and implementation of new strategies and technologies, is there any certainty that these innovations will be effective in the conflict environments for which they are intended? And is the conception of the future conflict they are

strengths and weaknesses of the various definitions before introducing the definition that this study will use. It starts with a review of definitions for *military innovation* and then expands the review to include definitions for *innovation* from the broader organizational literature.

### ***1.1.1. Existing Definitions for Military Innovation***

There does not appear to be a widely accepted definition for “military innovation.” A survey of the existing literature on military innovation produces two major findings: (1) many scholars fail to define innovation and (2) those who do provide a definition, often provide a definition for *military innovation* as something that must be distinguished from, and significantly different than, the definition of *innovation* that is commonly used in the organizational studies literature. Often, this body of literature focuses on studying only doctrinal innovations within the military and thus provides a definition for what they term *doctrinal innovation*. While this might be useful when studying doctrinal innovations, this overly restrictive definition is problematic; it implies that doctrinal innovations are the only type of innovations that matter for the military. Additionally, this is not consistent with most of the other literature that would consider doctrinal innovations only one of the many types of innovation.

Much of the literature on military innovation, including some of the seminal works on this phenomenon, fails to provide a clear definition of military innovation. These authors were able to avoid defining military innovation by focusing on cases that are universally recognized as representing major innovations. For example, Posen provides no definition when exploring the sources of military doctrine of France, Britain, and Germany between the World Wars.<sup>2</sup> Murray

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March 3 and 425<sup>th</sup> on April 29 but slipped to the top 10% in May; on March 18, 2014, it was back in the top 1%, ranking 67th. See: <http://www.merriam-webster.com/dictionary/innovation>. Merriam-webster.com defines innovation as: (1) the introduction of something new, (2) a new idea, method, or device. It defines the noun *change* as: (1) the act, process, or result of changing.

<sup>2</sup> Barry R. Posen, *The Sources of Military Doctrine: France, Britain, and Germany Between the World Wars* (Cornell, NY: Cornell Studies in Security Affairs, 1984).

and Millet also fail to define it when examining the innovation or failure to innovate of world powers between the two World Wars.<sup>3</sup> Adamsky also fails to provide a definition in his book, *The Culture of Military Innovation*, despite the fact that innovation is in the title of his book.<sup>4</sup> In some respects, these scholars appear to take their cue from Supreme Court Justice Potter Stewart who, realizing that pornography is difficult to define, simply wrote “I know it when I see it” in his concurring opinion of *Jacobellis v Ohio*.<sup>5</sup> Justice Stewart may have gotten away without a definition, and many scholars may argue that their cases are axiomatic and therefore need no definition, but the different and complex dynamics that constitute innovation in a broad sense and discussed in this study require a clear and comprehensive definition.

Rosen is one of the first scholars of military innovation to provide a definition, though it must be noted that he provides a definition for *major innovation* not innovation.<sup>6</sup> This is consistent with most military scholars who seek to explain major forms of change, those that the organization is least likely to adopt. He defines a *major [military] innovation* as “a change in one of the primary combat arms of a service in the way it fights or alternatively, as the creation of a new combat unit.”<sup>7</sup> He continues by stating that it involves two essential features: (1) “a change in the concepts of operation of that combat arm, that is, the ideas governing the ways it uses its forces to win a campaign, as opposed to a tactical innovation, which is a change in the way individual weapons are applied to their target and environment in battle and it;” and (2) “a change in the relation of that combat arm to other combat arms and a downgrading or

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<sup>3</sup> Williamson Murray and Allan R. Millet, *Military Innovation in the Interwar Period* (New York: Cambridge University Press, 1996).

<sup>4</sup> Dima Adamsky, *The Culture of Military Innovation: The Impact of Cultural Factors on the Revolution in Military Affairs in Russia, the US, and Israel* (Stanford, CA: Stanford University Press, 2010).

<sup>5</sup> Quote is from Supreme Court Justice Potter Stewart in his concurring opinion in *Jacobellis v Ohio* in 1968. Potter Stewart, *Jacobellis v. Ohio: Concurring Opinion of Justice Stewart*, June 22, 1964, Law.Cornell.edu, <http://www.law.cornell.edu/supremecourt/text/378/184>.

<sup>6</sup> Rosen, *Winning the Next War*, 7.

<sup>7</sup> Ibid.

abandoning of old concepts of operation and possibly of a formerly dominant weapon.”<sup>8</sup> He also describes what a major military innovation is not: “Changes in the formal doctrine of military organization that leave the essential workings of that organization unaltered do not count as innovation by this definition.”<sup>9</sup> Yet he continues to say that “the creation of new technologies” (technological innovations) “may not involve behavioral changes in the organization.” His definition is problematic as it does not seem to apply beyond doctrinal innovation; for example, it would appear to rule out changes in the objectives of military operations or organizational changes. If the military adopted the new goal of peacekeeping, this would have significant impact on its organizational structure and operational practices.<sup>10</sup> Meese uses March and Simon’s description of innovation, stating that “this definition implies that some portion of the previous organizational routine is replaced by new procedures, tactics, or strategy.” He argues that “if old strategy can coexist with a change, that change is not an innovation.”<sup>11</sup> Like many military innovation scholars, Meese is focused on doctrinal innovations; thus, like Rosen, his definition might be good for doctrinal innovation but is not other types of innovation.

Grissom defines *military innovation* as “a change in operational praxis that produces a significant increase in military effectiveness.” He develops this definition after surveying the literature on military innovation and finds that “military innovation scholars gravitate toward historical cases that share a distinct set of attributes.” For Grissom, these attributes “constitute a consensus (if tacit) definition of military innovation.” The three components of the tacit definition include: (1) “an innovation changes the manner in which military formations function

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<sup>8</sup> Rosen, *Winning the Next War*, 7-8.

<sup>9</sup> Ibid., 8.

<sup>10</sup> Theo Farrell and Terry Terriff. “The Sources of Military Change,” in *The Sources of Military Change: Culture, Politics, Technology*, ed. Theo Farrell and Terry Terriff (Boulder: Lynne Rienner Publishers, Inc., 2002), 5.

<sup>11</sup> Michael J. Meese, “Institutionalizing Maneuver Warfare: The Process of Organizational Change” in *Maneuver Warfare: An Anthology*, ed. Richard D. Hooker Jr. (Novato, CA: Presidio Press, 1993), 195.

in the field,” (2) “an innovation is significant in scope and impact,” and (3) “innovation is tacitly equated with greater military effectiveness.”<sup>12</sup> He is one of the few who includes the requirement for an innovation to be effective. While most innovations that endure are likely effective or they would be discarded, there is no reason to include it in the definition. For a military, it may be difficult to truly know the effectiveness of an innovation outside of war and thus, it would almost make war a necessary condition for any change to be called an innovation. Additionally, given the complexity of war, it might be difficult to determine the effectiveness of a specific innovation. Thus, while the effectiveness of an innovation is an important quality, it should be included as an evaluation criterion not as a definitional criterion.

Giese defines *military innovation* as “a change in the principal mission(s) of an organization.” He clarifies what he means by principal missions, describing them as “its primary or core tasks that affects doctrine, organizational structure, capabilities, and how resources are used.” According to Giese, indicators of military innovation include: “new doctrine, organizations, and capabilities in which resources (time, money, and personnel) are dedicated.”<sup>13</sup> This definition is problematic because it ignores other types of innovation; it is not clear why for the military only a change in a principal mission could be considered innovation while in other realms other forms of innovation are possible. For example, the mission statement for Apple Inc. is to “produce the best personal computers, mobile media, phones and personal software in the world.”<sup>14</sup> Thus, by Giese’s definition, Apple only innovated when it expanded into new

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<sup>12</sup> Adam Grissom, “The Future of Military Innovation Studies,” *The Journal of Strategic Studies* (October, 2006): 907.

<sup>13</sup> Jon F. Giese, “Military Innovation: Sources of Change for United States Special Operations Forces (SOF)” (Monterey, CA: Naval Postgraduate School, 1999), 4.

<sup>14</sup> On Apple’s website, it states that Apple’s mission is “Apple designs Macs, the best personal computers in the world, along with OS X, iLife, iWork and professional software. Apple leads the digital music revolution with its iPods and iTunes online store. Apple has reinvented the mobile phone with its revolutionary iPhone and App Store, and is defining the future of mobile media and computing devices with iPad.” This is not a mission statement, so I

domains, such as mobile media (iPads), phones (iPhone) and software because it resulted in a change in mission. However, after expanding into these new domains, any other changes—no matter how radical or significant—constituted something other than innovation. Additionally, the innovation of the assembly line in the automotive industry, which is widely recognized as a significant innovation, would not meet Giese’s definition as it did not fundamentally change the organization’s core mission.

Zisk defines *doctrinal innovation* as “a major change in how military planners conceptualize and prepare for future war.”<sup>15</sup> To distinguish between proactive and reactive doctrinal innovation, she defines *reactive innovation* as “a major change in thinking about and preparation for future war that occurs because of a change in war thinking or preparation made by a potential opponent.”<sup>16</sup> The shortfall of Zisk’s definition is that it implies that innovation, or at least doctrinal innovation, cannot happen in wartime since it has to do with “future war.” Thus, any changes in war she would likely classify as adaptation. Thus, whether or not something is classified as an innovation is completely dependent on the external environment: an environment of peace. Additionally, the exclusive focus on doctrine is problematic as pointed out by Farrell.<sup>17</sup> They observe that “not all militaries have a doctrinal tradition,”<sup>18</sup> and in different national contexts, doctrine “has different meaning, function and relative importance.”<sup>19</sup> Rosen

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took the content of what Apple had and turned it into a satisfactory mission statement. Apple, “Investor Relations,” Apple.com, last modified 2013, accessed March 8, 2013, <http://investor.apple.com/faq.cfm?FaqSetID=6>.

<sup>15</sup> Kimberly Zisk, *Engaging the Enemy: Organizational Theory and Soviet Military Innovation 1955-1991*, (Princeton, NJ: Princeton University Press, 1993), 4.

<sup>16</sup> Zisk, *Engaging the Enemy*, 4.

<sup>17</sup> Theo Farrell, “Figuring out Fighting Organisations: The New Organisational Analysis in Strategic Studies,” *Journal of Strategic Studies* 19, no. 1 (1996): 123.

<sup>18</sup> See, for example, Pascal Vennesson “Institution and airpower: The Making of the French Air Force,” *Journal of Strategic Studies* 18, no. 1 (1995): 40.

<sup>19</sup> Farrell, “Figuring out Fighting Organisations,” 123.



also points out that “changes in the formal doctrine of a military organization [may] leave the essential workings of the organization unaltered.”<sup>20</sup>

In his focus on the arms race during the Cold War and its impact on strategy, Evangelista defines *technological innovation* as “the development of new military technology that leads to significant change—for example in the realm of strategy, in the organization of military forces, or in the distribution of resources among services.”<sup>21</sup> This definition has a similar problem to Zisk’s definition in terms of it being overly narrow in scope. Instead of defining innovation, Farrell and Terriff define *military change* as “change in the goals, actual strategies, and/or structure of a military organization.”<sup>22</sup> Like many others, they focus specifically on *major* military change, remarking that they want to exclude “military changes of any minor sort—for example changes in operational means and methods (technologies and tactics) that have no implication for organizational strategy or structure.”<sup>23</sup> The strength of their definition is its simplicity and the fact that it is broad enough to include more than just doctrinal innovations. Like most definitions, however, it fails to distinguish change from innovation. Also, their definition states what type of change matters, but the definition does not include the concept of “newness.” In order to be innovation as opposed to change, the change should be something that is new to the organization. Hoffman comes up with the most basic definition of *innovation* in his edited volume that describes a number of military innovations including doctrinal, organizational and technological innovations. He defines *innovation* as “the creation of something new.” He states “whether it be a novel product or device, a different way to organize people or entities, an original process or method of doing things, or even a fresh use for an existing item.” For him

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<sup>20</sup> Rosen, *Winning the Next War*, 7.

<sup>21</sup> Matthew A. Evangelista, *Innovation and the Arms Race: How the United States and the Soviet Union Develop New Military Technologies* (Princeton, NJ: Princeton University Press, 1988), 51.

<sup>22</sup> Farrell and Terriff, “The Sources of Military Change,” 5.

<sup>23</sup> *Ibid.*

- Simon, Herbert A. "Rational Decision Making in Business Organizations." *The American Economic Review* 69, no. 4 (1979): 493-513.
- Simon, Steven. "The Price of the Surge." *Foreign Affairs* 87, no. 3 (2008): 57-76.
- Slappendel, Carol. "Perspectives on Innovation in Organizations." *Organizational Studies* 17, no. 1 (1996): 107-129.
- Smith, Mark, Janine Davidson, and Peter Brooks. "Micro-Foundations of Insurgent Violence: Implications for Iraq." Arlington, VA: Hicks & Associates, Inc., October 5, 2005.
- Smith, Neil and Sean MacFarland. "Anbar Awakens: The Tipping Point." *Military Review* 88, no. 2 (2008): 41-52.
- Snyder, Jack. *The Soviet Strategic Culture: Implications for Nuclear Options*. Santa Monica, CA: RAND, 1977.
- Sorley, Lewis. *A Better War: The Unexamined Victories and Final Tragedy of America's Last Years in Vietnam*. New York, NY: Harcourt, 1999.
- Stanton, Paul T. "Unit Immersion in Mosul: Establishing Stability in Transition." *Military Review* 86, no. 4 (2006): 60-70.
- Steele, Dennis. "Decisive-Action Training Rotations: 'Old School Without Going Back in Time.'" *Army Magazine* 63, no. 2 (2013): 26-37.
- Stewart, Potter. *Jacobellis v. Ohio: Concurring Opinion of Justice Stewart*. June 22, 1964. Law.Cornell.edu. Accessed September 8, 2012. <http://www.law.cornell.edu/supremecourt/text/378/184>.
- Stulberg, Adam N., Michael D. Salomone, and Austin G. Long. *Managing Defense Transformation*. Burlington: Ashgate, 2007.
- Sussman, Phil. "COIST staffs play crucial role on today's complex battlefield." Army.mil. June 19, 2009. Accessed February 28, 2013. [http://www.army.mil/article/23048/COIST\\_staffs\\_play\\_crucial\\_role\\_on\\_today\\_\\_039\\_s\\_complex\\_battlefield/](http://www.army.mil/article/23048/COIST_staffs_play_crucial_role_on_today__039_s_complex_battlefield/).
- Tesluk, Paul E., James L. Farr and Stephanie R. Klein. "Influences of Organizational Culture and Climate on Individual Creativity." *Journal of Creative Behavior* 31, no. 1 (1997): 27-41.
- Tetlock, Philip E. *Expert Political Judgment: How Good Is It? How Can We Know?* Princeton, NJ: Princeton University Press, 2005.
- Thamhain, Hans J. and Gary R. Gemmill. "Influence Styles of Project Managers: Some Project Performance Correlates." *Academy of Management Journal* 17, no. 2 (1974): 216-224.