

# Addressing Vulnerabilities to the Army's Human Capital Advantage

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Applied Policy Project  
*prepared for*  
United States Army Training and Doctrine Command



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## **DISCLAIMER**

The author conducted this study as part of the program of professional education at the Frank Batten School of Leadership and Public Policy, University of Virginia. This paper is submitted in partial fulfillment of the course requirements for the Master of Public Policy degree. The judgments and conclusions are solely those of the author, and are not necessarily endorsed by the Batten School, by the University of Virginia, or by any other agency. As an additional disclaimer, the statements, judgements, and conclusions contained in this report are those of the author in a non-duty capacity, and are not endorsed by nor reflect official policy or position of United States Army Training and Doctrine Command (TRADOC); the Department of Army (DA); the Department of Defense (DoD); or any other entity.

## **HONOR STATEMENT**

On my honor as a student, I have neither given nor received unauthorized aid on this assignment.

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A handwritten signature in black ink, appearing to read "Dawn Joines", with a large, stylized loop at the end.

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## **KEY ACRONYMS AND TERMS**

2+3	Main potential U.S. adversaries that include: Russia and China, the 2, and North Korea, Iran, and Violent Extremist Organizations, the 3.
AFC	United States Army Futures Command headquartered in Austin, Texas.
BCAP	Battalion Commander Assessment Program.
CAC	United States Army Combined Arms Center, a subordinate headquarters of United States Army Training and Doctrine Command located at Fort Leavenworth, Kansas.
CAPL	Center for the Army Profession and Leadership, a subordinate organization of the Combined Arms Center located at Fort Leavenworth, Kansas. Established in 2019, CAPL is the result of combining the Center for Army Leadership and the Center for the Army Profession and Ethic.
CASAL	Center for Army Leadership (CAL) Annual Survey of Army Leadership.
CCAP	Colonels Command Assessment Program.
CFT	Cross Functional Team.
MDO	Multi-Doman Operations; describes how the U.S. Army, as part of the joint force, can counter and defeat a near-peer adversary capable of contesting the U.S. in all domains (air, land, maritime, space, and cyberspace) in both competition and armed conflict.
OE	Operational Environment; a composite of the conditions, circumstances, and influences that affect the employment of capabilities and bear on the decisions of the commander.
PME	Professional Military Education.
SMAP	Sergeants Majors Assessment Program.
STE	Synthetic Training Environment; a collective training environment that optimizes human performance within a multi-echelon mixed-reality environment.
TRADOC	United States Army Training and Doctrine Command headquartered at Fort Eustis, Virginia.

## **EXECUTIVE SUMMARY**

“It’s the people that are going to allow us to win on the battlefield. It’s the people that are going to allow us to have readiness and modernization and reform...” (McConville, 2019). When the 40<sup>th</sup> Chief of Staff of the Army spoke these words, he highlighted the most important element of the United States Army. At a time when multi-domain complexities will present themselves on current and future battlefields, competition between great powers and emerging threats are on the rise, and some advantages may no longer be the exclusive preserve of the United States, Army human capital provides a decisive constant through a combination of lethality and leadership that feed a “Total Soldier” concept.

While the Army continues to address human capital comprehensively by modernizing its equipment and adopting a new concept for the way it fights, we can never stop considering the question: “What can the Army do to ensure its asymmetric advantage in human capital is maintained?” As multi-domain operations become more realized, adaptation demands that changing to new warfare will require re-learning Army craft, and in doing so, assesses not only the context of a new environment, but includes elements of the cognitive, critical and creative thinking, execution in ambiguity, and strategic ethics of the Force. This will be key, as the Army looks to balance its technological innovations and supremacy in maneuver warfare with Soldier<sup>1</sup> capability and readiness.

This report aims to consider Army human capital in a holistic manner by presenting its importance to the Army function and highlighting the vulnerabilities that may challenge it in the future. It further aims to synthesize parallel, foreign, and non-military research, while building recommendations on current or planned initiatives the Army is undertaking. Using four criteria to evaluate the proposed alternatives that address challenges and vulnerabilities facing Army human capital, I recommend that TRADOC<sup>2</sup> pursue establishing a joint<sup>3</sup>, non-materiel based Human Capital Modernization Cross Functional Team. This recommendation provides the foundation to underwrite many future and more adaptive endeavors (include components of other evaluated alternatives) that specifically target the emerging needs to train and assess human capital, yet does not isolate the potential for human capital training and assessment to a specific group of Soldiers.

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<sup>1</sup> In keeping with unique capitalization for internal Army correspondence, noted in Army Regulation 25-50, paragraph 1-14a, Preparing and Managing Correspondence, this report will capitalize the word “Soldier” when it refers to a U.S. Army Soldier.

<sup>2</sup> While this report is presented to TRADOC, it will often use “TRADOC” and “Army” interchangeably given that TRADOC is a premier force generating entity of the Army and possesses the influence and capability to implement these potential alternatives.

<sup>3</sup> “Joint” in this context implies “the junction of two or more” or “where two things or parts are joined,” as defined by Merriam-Webster. Other uses of “joint” in this report, e.g., “Joint Force” or “joint capability,” more accurately imply “cross-Service combination wherein the capability...is understood to be synergistic, with the sum greater than its parts,” as defined in Joint Publication 1.

## **BACKGROUND**

### **What is the Army's Human Capital Advantage?**

"It's the people that are going to allow us to win on the battlefield. It's the people that are going to allow us to have readiness and modernization and reform..." (McConville, 2019). "Human capital, the set of skills, knowledge, capabilities and attributes embodied in people, is crucial to the capacity to absorb and organize knowledge and to innovate" (Lenihan et al., 2019). At a time when multi-domain complexities, rapidly changing environments, competition between great powers, and emerging threats and challenges factor much into the calculus of strategic planning, the Army's People, its human capital, warrant constant and fluid consideration. Human capital defines, arguably, the most important of the Army's two asymmetric advantages. In the first advantage, the Army relies on its advantage to execute maneuver warfare, that is, to disrupt and disorganize the enemy rather than by fixated on a mentality of kill-this and kill-that (Wallace, 2016). Traditional combined arms maneuver<sup>4</sup> brings a sophisticated mix of strategies with weapons systems that complement one another, fortifying a "force-on-force attack in a synergized way to optimize effectiveness" (Osborn, 2020). In the second advantage, human capital provides the Army a significant edge through a combination of lethality and leadership that feed a "Total Soldier" concept. In this concept, the Army possesses a unique breed of human capital that learns, understands, innovates, builds cohesive teams, and exercises judgment. Furthermore, resiliency, critical and creative thinking, comfort with ambiguity, the desire to grow and develop in ambiguity, and strategic ethics and morality all define the Army profession and serve as the catalyst for an enduring advantage.

In the past, through a combination of materiel, technology, and human capital, the Army has enjoyed a position of relative competitive advantage. As the global security environment has grown increasingly complex, however, both technological and materiel advantages between the U.S. and challengers or adversaries it will face are diminishing. Human capital, its relevance and enduring nature, must now serve as a more prominent pillar with which the Army considers current and future strategy. How then do we define Army human capital and the advantage it provides? This report has considered five tenets to articulate the composition, uniqueness, and value of the Army's human capital and its asymmetric advantage for the Army function.

First, Soldiers pledge allegiance and service to Constitutional values and embody the values and ideals of the Nation, not a political party or person. By swearing an oath to the Constitution, a Soldier's purpose is defined by being part of something greater than themselves in an alignment of loyalty and duty to the document that unites our nation. The oath injects morality and the sense of duty, that is absent from many military organizations around the world where loyalty to party or political leaders prevail.

Second, the Army's formations are composed of an all-volunteer force. In 1973, the United States eliminated the draft partly due to the effects of the war in Vietnam, the high quantity of draft age males, needs of the Army no longer requiring a universal draft, and cost. However, the value of an all-volunteer force today projects a demonstrated

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<sup>4</sup> Multi-Domain Operations adapts traditional combined arms maneuver and redefines it, given the nature of modern threats and the advent of new technologies (TRADOC, 2018); not the subject of this paper.

commitment to Constitutional values and proves some level of resiliency in the Army model to sustain and care consistently for its troops.

Third, the Army identity is shaped through core values that are embedded in a culture of trust, respect, and ethics. In 1981, then clarified in 2012, doctrine recognized that the Army Ethic is informed by law, Army Values, beliefs expressed in code and creeds, and is embedded within an Army culture of trust (CAPL, 2018). The seven Army Values, as we know them today: Loyalty, Duty, Respect, Selfless Service, Honor, Integrity, and Personal Courage (LDRSHIP), are contained within the moral principles of the Army Ethic and serve as constant (CAC, 2018). Soldiers exemplify these values and they remain the centerpiece of the Army organization, wherein Soldier quality makes the Army a premier force.

Fourth, Soldiers and their fellow American citizens justify the potential for death (the ultimate sacrifice) with the assumption that it is purposeful and worthy of the freedoms and sacrificial ideology the Soldier contributes to. From a sociological perspective, by dying, Soldiers prove that something is worth dying for, its function manifested in sacrifice, and articulated to the nation in that manner (Brænder, 2009). However, for this sacrifice to be of value, and for the assumption that it is purposeful to hold, both the Soldier and the victims (fellow service members, family members, Americans), all consent to this ideology, branding selflessness as the necessary precursor to enduring freedom. In willfully subordinating oneself, death becomes verification that a greater purpose exists when one lay down his life for others.

Lastly, the Army Soldier exhibits, in tandem, a unique and necessary combination of lethality and leadership to construct what this report refers to as the "Total Soldier." Lethality is defined as the methods in which we become proficient in new skills, while maintaining mastery in others. It is the capacity and skill to address gaps and transition the Army to Multi-Domain Operations (MDO) as quickly, effectively, and efficiently as possible. It is the academics, and technical and tactical skills we expect Soldiers and leaders to possess. However, the leadership component, in broader terms, comes from addressing the way Soldiers and leaders think, how they prepare and execute their training, and how they make decisions and apply a creative and critical eye. It is the strategic moral advantage the Army has against the enemy. It is the focus and practice in cognitive growth and development. It is competencies and how Soldiers and leaders are trained in developing them and how those areas can be adequately assessed by the individual and the collective.

Altogether, these five tenets not only provide a tangible definition for Army human capital, but strive to highlight both "human" and "capital" as elements of necessary importance and continuous attention. The advantage lies when it is recognized organizationally, tactically, and developmentally. Maneuver warfare does not exist if the right people don't possess the right mentality to make the right decisions. Well-trained, mentally conscious Soldiers are "fundamental to realizing any improvements in technology, techniques, or strategy" (CAPL, 2018). "It is Soldiers who use technology, execute techniques, and accomplish strategies" (CAPL, 2018). It is their primacy which bears the hardships of combat, adapts to the demands of complex environments, and accomplishes the mission (CAPL, 2018). It is the foundation which builds collective and individual proficiency and the willingness provide the unmatched advantage.



## **Human Capital Importance to the Army Function**

The Army recognizes that the Soldier remains the most discriminately lethal element on the battlefield. To speak of human capital concepts operationally, is to recognize that human capital occupies a significant space in joint force mission planning and execution, serves as an adaptable tool able to respond to and compete with adversaries, and necessary for the function of the Army. Only when the Army envisions *optimizing* human capital can it prevent conflict, shape the international environment, and win decisively (CAC, 2014). Regardless of environment's difficulty, warfare fundamentally remains a human contest of opposing wills and Soldiers must become the product of systems and methodologies that represent an integrated joint force that is more agile, more rapidly deployable, and more capable against the wider range of threats (CAC, 2014).

"It is not enough for leaders to tolerate or even grow comfortable with the uncertainty described in the future environment. Operating in this complex environment requires agile, adaptive, and ethical leaders trained and educated to *improve and thrive* in uncertainty. These leaders must possess a natural inclination for disruptive innovation and an abiding sense of urgency both in times of crisis and times of opportunity. They must be professionals of strong character, physically supreme, and resilient to overcome the effects of the great trauma that is the experience of war. The Army must empower Soldiers not only with exquisite technology, but also with broad cultural understanding, professional judgment, critical thinking, and technical skills, so that they can adapt to unforeseen and unpredictable conditions as they emerge" (CAC, 2014).

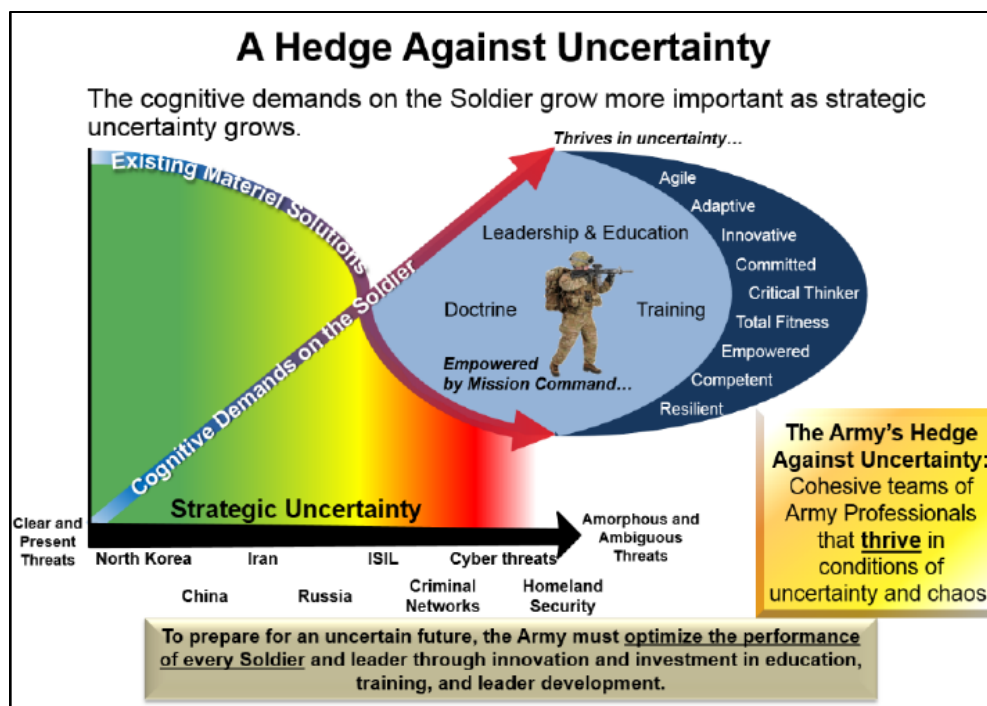
In a complex and multi-domain environment, and in order to achieve the level of coordinated and integrated planning, training, and execution required of military operations, human capital and the way in which the Army acquires, educates, molds, and develops it, simply becomes more the necessity, rather than any luxury.

## **As a Part of the Joint Force**

"The nature of the challenges to the U.S. and its interests demand that the Armed Forces operate as a closely integrated joint team with interagency and multinational partners across the range of military operations" (Joint Chiefs of Staff, 2017). Joint warfare relies upon effective coordination of Service capabilities and expertise that then become capable of unified action, merging capabilities and skill sets of assigned Service components (JCS, 2017). Human capital will define the very essence of *how* the Army will operate as a part of the joint force. Humans, not doctrinal concepts, advance the conversation to discover, create, improve, and sustain the necessary elements of joint capability. Joint Publication 1 provides the Armed Forces a continuous developmental framework that lays out a combination of a knowledge-based, cognitive skill driven approach to the joint force. Thus, Army human capital must reflect similarly, where one's knowledge foundation and baseline competencies provide for both Army and individually driven opportunities to develop and adapt continuously, rather than intermittently.

## As a Counter to Threats

The reemergence of great power competition places an increased premium on human capital, decision making speed and ability, and efficient action. In 2014, the Combined Arms Center (CAC) published a White Paper outlining the frameworks for optimizing human performance. CAC asserted that in order to develop and maintain a human edge over future threats, the Army required a “sustained investment in the physical, cognitive, and social aspects of Soldiers, supplied with continuous innovation in training, education, leader development, and both talent acquisition and talent management” (CAC, 2014). See *Figure 1*. The key notion is that *optimizing* human performance through the building of resilient Soldiers, adaptive leaders, and cohesive teams drives response to the Army Vision at-large and fits within the broader context needed to counter current and future threats (CAC, 2014).



**Figure 1. The Soldier-A Hedge Against Uncertainty (CAC, 2014)**

## How is the Army training and measuring Human Capital?

The Army Operating Concept (AOC) posed that “future-armed conflict will require units to present enemies with multiple dilemmas in multiple domains” (TRADOC, 2014). Leader development strategies and programs currently enhance Key System Attributes (KSAs) required in the evolving Operational Environment (OE) and strive to increase the operational experience of leaders (Headquarters, Maneuver Center of Excellence, 2020). These strategies and plans directly tie an organization’s leader-development efforts in Unit Training Plans (UTPs), enabling a synthesis between development programs and operational training experiences (Headquarters, Maneuver Center of Excellence, 2020). Army branches align Professional Military Education (PME) courses with follow-on assignments to ensure that leaders are prepared for the operational experience that will follow (Headquarters, Maneuver Center of Excellence, 2020).

While the material and scenarios in current methodologies accurately mirror changes in the evolving OE and incorporate the tenets of multi-domain operations, it

likely only addresses one factor in the human capital conversation. Years of qualitative feedback from commanders, and the weight of adversary investment and effort in human capital areas, remains somewhat absent in the total equation and leaves a question as to whether human capital might stall or regress in the coming decades. (Contributor, 2020).

Since 2005, however, the Army has conducted an annual survey that captures some aspects of Army leadership. Named, the Annual Survey for Army Leadership (CASAL), this report gathers assessments from the Army about leadership and leader development, and has been a dependable source to inform senior leaders about the level of leadership quality and associated upward or downward trends (CAC, 2017). “CASAL affords decision makers and stakeholders the option to make informed course corrections or to leverage prevailing strengths in the Army” (CAC, 2017). CASAL results are analyzed to detect small changes in the quality of leadership skills and the effectiveness of leader development practices, while also used to confirm existing Army practices, or provide data for improvement initiatives as downward trends occur (CAC, 2017).

### **Transforming Human Capital: Focusing on the Rote, on Competencies, or Both?**

Military missions always require highly trained and capable personnel (Alexander et al., 2017). Since the 1990s, the spectrum of military missions expanded from traditional combat missions to the addition of humanitarian aid, disaster relief and peacekeeping operations (Alexander et al., 2017). What is common across all of these is that Soldiers are acting in highly dangerous environments with much uncertainty and little tolerance for errors or miscalculated decisions. Because of the wide breadth of situations and complexities involved, there is a higher degree of freedom given to units (Alexander et al., 2017). Foreign militaries and domestic firms have addressed this by focusing primarily on competency-oriented approaches to developing human capital, rather than focusing on rote, traditional training objectives.

“Competency describes the ability and potential of a human to act” (Alexander et al., 2017). “It is the ability and willingness to use individual knowledge, skills and abilities as well as personal values and attitudes” (Harrison et al., 2019). Competency further addresses available, learnable skills and abilities of individuals in problem solving, then delivers action in effective and efficient ways (Harrison et al., 2019). Through interaction and cooperation, competency-oriented training supported by continuous reflection, has delivered more focused, efficient, and timely action in areas similar and more importantly connected with practical, real-world situations one might encounter (Harrison et al., 2019).

Assuming this type of learning is more self-organized, so as to create new pathways for processing information and acting, one will ideally plan, perform and analyze their own process of learning which supplements the traditional evaluative measures that dominate how well one handles certain situations (Alexander et al., 2017). The outcome reflects a holistic awareness that is necessary to understand and adapt in complex situations, and not just isolated aspects within them (Alexander et al., 2017). Information that better prepares Soldiers to face vulnerabilities, both internal and external to the Army, is not simply presented, but actively experienced, so that training applies and support competencies over just tasks (Alexander et al., 2017).

## Operational Environment Trends

“The Army finds itself at a historical inflection point, where disparate yet related elements of the OE are converging, creating a situation where fast-moving trends across the Diplomacy, Information, Military and Economic (DIME)-spheres are rapidly transforming the nature of all aspects of society and human life—including the character of warfare” (TRADOC, 2019). See *Figure 2*. In recent decades, we have witnessed substantial changes in how people live, create, think, and prosper (TRADOC, 2019). Our understanding of these changes helps us understand how the strategic security environment and the character of warfare itself is transforming from the present, into the Era of Transition<sup>5</sup>, and then into a culminating point in the Era of Contested Equality<sup>6</sup> (TRADOC, 2019). Advances in technologies and strategy already shape how our potential adversaries consider and plan for conflict. In operations from Desert Storm through Iraq and Afghanistan, our main potential adversaries, the so-called “2+3” of Russia, China, North Korea, Iran, and Violent Extremist Organizations (VEO), Al-Qaeda and the Islamic State, came to realize that U.S. military superiority could be mitigated by time, space, distance, and perception (TRADOC, 2019). Potential adversaries are now thinking in terms of hybrid strategies, which allow them to operate at times and places of their choosing, often at a level below the threshold of warfare (TRADOC, 2019). While these ideas are not new, 2+3 actors are matching traditional operations, other hybrid strategies, and asymmetric warfare tactics with technologies and capabilities that prevent, stall, or complicate the United States’ ability to commit forces prior to adversaries achieving their political objectives (TRADOC, 2019).

### **Global Trends and Challenges to Structure, Order, and Institutions (2017-2050)**

- *Evolving geopolitics*
- *Resurgent nationalism*
- *Changing demographics*
- *Unease with globalization*
- *Competition for resources*
- *Rapid development of technology*
- *Disparities in economic resources and social influence*
- *Perceived relative deprivations*

**Figure 2. Global Trends (TRADOC, 2019)**

“TRADOC envisions the OE bringing an inexorable series of movements that question the character of warfare. In it, the proliferation of high technology coupled with the speed of human interaction and pervasive connectivity means that no one nation will have an absolute strategic advantage in capabilities, and even when breakthroughs occur, the advantages they confer will be fleeting, as rivals quickly adapt” (TRADOC, 2019).

Under these conditions, the physicality of warfare becomes less important than the cognitive and the moral (TRADOC, 2019). Military operations must then be increasingly aimed at using the cognitive and moral dimensions to target an enemy’s

<sup>5</sup> Present-2035; a period where our adversaries can take advantage of new technologies, new doctrine, and revised strategic concepts to effectively challenge United States military forces across multiple domains (TRADOC, 2019).

<sup>6</sup> 2035-2050; a period is marked by significant breakthroughs in technology and convergences in terms of capabilities (TRADOC, 2019).

will (TRADOC, 2019). As a result, there will be fewer self-imposed restrictions by some powers, creating a subtle empowerment clause for Soldiers to think and act differently than traditional response thinking (TRADOC, 2019).

### **Adversary Human Capital Methodologies and Outcomes**

This area is harder to assess, but we know that many, if not all 2+3 adversaries and others, are developing practical, alternatively ethical, and materiel methodologies in a constant effort to bridge the gap between themselves and the U.S., and to gain any advantage they can. Adversaries are increasingly relying on non-traditional forms of action that democracies or the international community, who are adhering to norms, take issue with. Each adversary is working to draw upon the same advances in technology and the speed of human interaction to raise their capabilities (TRADOC, 2019). This includes partnering with, or accepting the support of other nation-states or criminal organizations to acquire weapons, take advantage of commercial and black-market technologies, and rely on skilled usage of social media and online communications to wage information campaigns (Deputy Chief of Staff, G-2 TRADOC, 2020). New doctrine will boast an increase in collaboration across all domains, promoting leapfrog opportunities<sup>7</sup>, as in China, which could provide a better position to adopt new materiel and methods. In Russia, operational and strategic decision making will be pushed to much lower levels than previously, creating a level of flexibility and providing space for a leader's initiative to adapt to new confrontations on the battlefield (Deputy Chief of Staff, G-2 TRADOC, 2020). And further, noting the consequences of the increase in speed of human action, adversaries will likely pursue enhancements to human performance that run counter to the moral and ethical prioritization the U.S. gives to the employment of forces.

### **Evidence and Challenges in Parallel, Foreign, and Non-Military Contexts**

#### ***Human Capital-Intensive Firms***

"Since the mid-1990s, the productive activity of firms is mainly based on human capital resources" (C`ezanne et al., 2019). It is generally recognized most modern firms generate innovation, value, and performance using the knowledge and skills of their founders, managers and employees, all while combining them efficiently (C`ezanne et al., 2019). Human capital-intensive firms (HCIFs) are able to capture the transformation and complexity of productiveness in globalized economies by relying more on human assets than they otherwise would (C`ezanne et al., 2019). The human capital impact, in relation to value creation, conveys that a highly-skilled workforce, internal and external social networks, and diversified funding sources, result in HCIFs having higher performance metrics than other types of firms, and may support growth in their field (C`ezanne et al., 2019).

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<sup>7</sup> "In this theory, the United States' advantages would be long-term disadvantages because the entrenched business and political interests that support military dominance will hamper adapting in the future." See Blanken et. al, *America's Military Is Choking on Old Technology*, 2018.

## Canadian Labor Market

“New technologies will continue to alter demand for various skills and talents in the labor market” (Jansen et al., 2019). Policy interventions should place emphasis on skills and training within three groups: new entrants to the labor market, those already in the labor market, and those who are displaced from the labor market (Jansen et al., 2019). Research has only recently begun to address necessary action in an era of large-scale technological disruption, but it generally suggests focus on retraining programs and initiatives (Jansen et al., 2019). How technology disrupts the workforce, information on the effectiveness of retraining programs, and which skills are likely to be in high demand, however, are frequently noted as the prime knowledge gaps (Jansen et al., 2019). Existing research suggests that there will be an increase in demand for non-cognitive skills that involve empathy and creativity, however these are not specified as necessary to building new interventions (Jansen et al., 2019). A Canadian government evaluation concluded that the field is much too novel, indicating that significant gaps exist in what is known about retraining effectiveness for different groups in the labor market, both in the short and long term, and relative to countering emerging disruptions and challenges (Jansen et al., 2019).

## Australian Law Firms

Based on interviews with 21 partners of Australian law firms, there are 10 findings that point to talent management challenges that affect competition in the global business context (Suseno & Pinnington, 2017). Although research in human resource

Characteristics	Human capital challenges	HR strategies
Knowledge intensity	1. Reputation building and maintenance 2. ‘Cat herding’ issue 3. Knowledge acquisition	- Social capital for client retention and satisfaction - Ensuring P-O fit - Continuous learning and development
Capital intensity	1. Revenue and profitability through internationalization 2. Managing knowledge across borders 3. Managing employee mobility	- Growth through cross-selling opportunities - Organizational learning and knowledge management systems - External engagement through partnership, alliance or secondment opportunities
Professionalized workforce	1. Talent acquisition and retention 2. Talent engagement 3. Performance management 4. Leadership capability	- Innovative recruitment and retention strategies - Engaging talent: Creating a positive organizational culture - Rewards and performance - Succession planning through leadership development

**Figure 3. Human capital challenges and implications for HR practices (Suseno & Pinnington, 2017)**

management (HRM) has mainly focus on attraction and development, *Figure 3* notes the broader and more flexible strategies for various types of firms, though the authors conclude an absence of empirical data to validate them.<sup>8</sup>

## 21<sup>st</sup> Century Skills in the U.S. Air Force

“In the next few years, more than one-third of the desired core skill sets of most occupations will be composed of skills that are not considered crucial to the job today”

<sup>8</sup> “P-O fit” refers to “person-organization fit” or the fit between employees and organization (Suseno & Pennington, 2017).

(Herman et al., 2019). The U.S. is facing an unprecedented crisis of skill mismatch between the supply and demand of skills, and between current and anticipated skill needs (Herman et al., 2019). Absent the specific skill requirement being known, it is clear that workers will need to be able to rapidly adapt to new contexts and needs (Herman et al., 2019). As the Air Force attempts to build an evidentiary base, the absence of rigorous evidence within the private sector holds that agencies across government and industry are all similarly grappling with this challenge. Nevertheless, existing knowledge from outside of the military is crucial to closing gaps and helps the Air Force avoid missteps in implementing new strategies (Herman et al., 2019). If nothing else, actions “inform the continuum of learning and development in the Air Force,” which could help Airmen perform better in new and complex contexts (Herman et al., 2019).

### ***Human Capital, Education, and National Security: The Israeli-Iranian Arms Race***

“An increase in the importance that a state attributes to its future (empirically in its education system) leads to a decline in current civilian services, but increases its future human capital, civilian services, national security, and social welfare” (Bar-El et al., 2018). Data used to assess human capital relative to longer term national security, in the context of the Israeli-Iranian arms race, shows that a partiality for short-term gains impedes investment in human capital and inhibits future economic growth, national security, and social welfare in the long term (Bar-El et al., 2018). Bar-El et al. assert that by increasing human capital stock (achieved mainly by increasing the expenditure on education) there will be a positive correlation between this and the measured effectiveness of the military (Bar-El et al., 2018). The central role of human capital, in this context, reveals that investment and effectiveness education, and therefore human capital, might have proved vital in establishing its military superiority over Israel’s Middle Eastern rivals during the previous decades (Bar-El et al., 2018). When an entity, be it state or organization, increases the importance of the future (in this context, increasing the effectiveness of the education system) it leads to an increase in the growth of its relative military power and to an increase in its *future* human capital (Bar-El et al., 2018).

### ***Concept in Major League Baseball***

Human capital resource emergence, as it relates to providing a competitive advantage, suggests a synergistic manner, in which value obtained from an individual can be amplified to generate unit-level outcomes that are greater than that which can be attributed to underlying individual human capital parts (Eckardt et al., 2020). In a sample study from Major League Baseball, it was determined that with a narrower emphasis on individual human capital parts, there emerged an association between the individual parts and a subsequent emergence of a higher, unit-level resource that revealed greater synergy among members (Eckardt et al., 2020). The results suggests that the focus on and the actual performance of the individual yields a cumulatively greater effect for the larger organization (Eckardt et al., 2020). More simply, the capital a unit attains, combined with the performance of the individual yields an emergent effect that can then be exploit to a broader scope of goals or challenges.



## Emerging U.S. Army Initiatives

### **Synthetic Training Environment**

The synthetic training environment (STE) is one of the Army's eight cross-functional teams that is working on challenges in Army modernization because it connects two domains: leaders to tools (Palmer & Keller, 2019). The synthetic training environment is what will connect a materiel solution to the warfighter by bridging technological innovation to leaders and Soldiers who can employ these innovations on

Current Virtual Training	Future Training (STE)
<ul style="list-style-type: none"><li>• unrealistic: sterile, predictable and contrived;</li><li>• lacks dynamism;</li><li>• does not simulate human interaction;</li><li>• poor data collection;</li><li>• does not train cross-domain convergence;</li><li>• systems are outdated and not interoperable;</li><li>• difficult to access, facility-specific, long wait times; and</li><li>• 4–6 months to set up, inconsistently compatible formats.</li></ul>	<ul style="list-style-type: none"><li>• realistic terrain, effects and interaction;</li><li>• dynamic, trains problem-solving and mission command;</li><li>• simulates human interaction and population dynamics;</li><li>• collects and analyzes vast quantities of data;</li><li>• enables multi-domain training;</li><li>• all systems are interoperable;</li><li>• available at the point of need; and</li><li>• immediate simulations of any terrain through One World Terrain.</li></ul>

**Figure 4. Addressing current shortcomings (Rozman, 2020)**

the battlefield (Palmer & Keller, 2019). “STE is a collective training environment that optimizes human performance within a multi-echelon mixed-reality environment, providing immersive and intuitive capabilities to keep pace with a changing operational environment and enable Army training on joint combined arms operations” (USC-ICT, 2018). In theory, the STE

provides the Army transition from facility-based training and allows the Army to train at the point of need while addressing clear and longstanding challenges with current virtual training; see *Figure 4* (Rozman, 2020).

STE, at present, continues to work through perfecting basic functions that provide capability in a virtual, constructive, and live capacity or combination therein. When asked what STE can do today, general feedback ranged from “not as much as we hoped,” to “...mismatched with the user’s functional commands and the performance of the simulator or simulations that is being commanded to do something” (Contributor, 2020). Even this year, the time table for initial operating capability and full operational capability have continue to shift to the right (Judson, 2020; Rozman, 2020). Leaders from the Army Capability Management-Synthetic Training Environment (ACM-STE) have attributed setbacks and the inability to conduct sustained, basic tactical functions in testing to software, prototyping, and at times, contract issues (Contributor, 2020). While STE’s performance may be under-defined or simply incapable of meeting the anticipated capability now, leaders and experts across this area continue to work through this complicated issue to develop STE incrementally with industry partners while remaining informed by user feedback in the prototype field testing (Rozman, 2020).



The idea of a synthetic environment for training across a myriad of competencies and tasks creates a marketplace of content and threat behavior that mimics the complexity of future combat (Winnefeld & Tovo, 2021). Given the potential of these future, joint, and all-domain battlefield environments where Soldiers are likely to find themselves, operations, decision making, and creativity require the utmost flexibility. As Army leaders have recently commented on the potential and progress of the STE, the question must be asked, “What more could it do?” The video gaming industry, for example, possesses the technical talent and insights needed to make a synthetic training environment, but also offers its users greater freedom of effects based on increasingly complex decisions that players can make (Winnefeld & Tovo, 2021). And in fact, the Army has demonstrated a pliability to embrace virtual training that tests and assesses in this capacity. In 2019, the Institute for Creative Technologies at the University of Southern California along with the U.S. Army Simulation and Training Technology Center in Orlando, Florida developed the Emergent Leader Immersive Training Environment (ELITE) program that features 13 scenarios that Soldiers could potentially face when dealing with reported sexual harassment or sexual assault incidents (Lacdan, 2019). This program measures success based on the number of correct responses chosen in a given scenario. Through interacting with virtual human or avatar, project managers reported a freer response from participants, as opposed to interacting with another human (Lacdan, 2019).

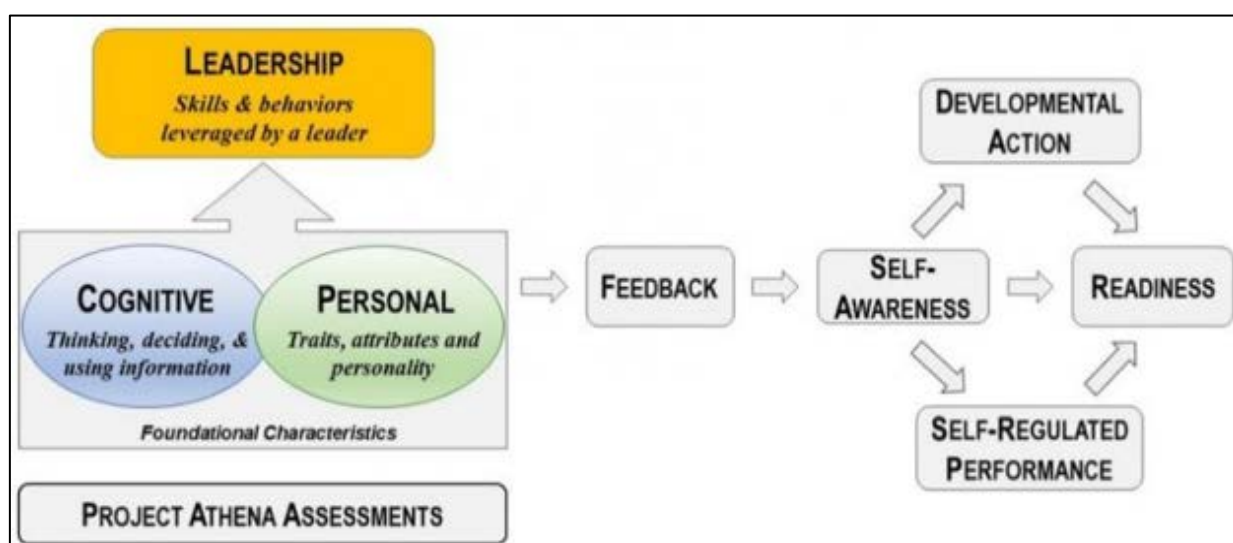
But what if the Army's vision for the STE included a step up from this? For example, an infantry company, training in the STE in Fort Bragg, North Carolina is training with an infantry company on the ground in West Africa. The two units are responding to threat scenario that involves elements that may challenge multiple components of one's decision-making ability (employment of child Soldiers or insurgents using women and children as human shields, for example). Rather than *choosing* a correct response, the STE could provide the capability to record and assess *actions* played out in their entirety. It takes training and assessment one step further from just a correct or incorrect response with built in after effects, to allowing the situation to physically develop as dynamically as possible, while potentially presenting more or fewer complications that the user must deal with as they progress. In this scenario, we get an opportunity to make our mistakes, watch them play out as if they are actually occurring, and learn from them.

Another example is STE application to sexual assault or sexual harassment training scenarios. Rather than relying on training effectiveness through pre-determined feedback and correct or incorrect response choice, the STE might aid in training and assessing the physical effects of a Soldier's decision making when intervening. This not only aligns with the dynamic nature that these types of situations have the potential to evolve into, but building STE to support such advanced interaction might provide valuable information to users on more personal capabilities in complex situations, such as speed of action, brain functions relating to problem solving abilities relative to action, time delayed actions based on confidence, competence, and awareness. While this commentary is simplified and relatively understated, it highlights some potential for the STE to perform well above traditional military functions in anticipated combat or non-combat environments.

### *Effectiveness of simulations methodologies*

Recognizing the impending transition to greater reliance on simulations and simulations assessments, high physical fidelity simulations are not required for effectively training collective skills, can impose considerable costs, and may limit opportunities for participants to practice (Straus et al., 2019). Existing research suggests, however, that lower physical fidelity simulations can be effective for collective training when designed to provide higher psychological fidelity and can be more accessible, thereby providing more opportunities for practice (Straus et al., 2019). “The overvaluation of high physical fidelity and undervaluation of high psychological fidelity are barriers that must be addressed in any plan to increase reliance on virtual systems as the Army transitions to the STE” (Straus et al., 2019).

### **Project Athena**



**Figure 5. Depiction of how Project Athena assessments identify areas for development and how an individual can use that information to change performance (CAPL, 2021)**

In July 2020, the Army fielded a TRADOC initiated, personal and professional self-development program called *Project Athena* (Stenson, 2021). The program’s design is to give future and current Soldiers a framework to strengthen their self-awareness and encourage self-development throughout their military careers (Stenson, 2021). Project Athena’s primary goal is to facilitate Army leaders to make better decisions, and to realize the best version of themselves. Each component of Project Athena targets personal and professional qualities while Soldiers attend PME that will benefit them as they prepare to assume new leadership roles. For example, in the Basic Leaders Course (BLC), designed for junior enlisted Soldiers, leadership, interpersonal skills and mental fortitude are key, and the selected assessments focus on a Soldier’s role as a first line leader (Stenson, 2021). As Soldiers attend more advanced PME courses throughout their career, the assessments they will receive will correspond to the duties they are performing or will perform while building self-awareness and reducing counter-productive tendencies. This initiative is a part of a broader Army strategy to provide

Soldiers and the Army with career long talent-based assessments and in-line with the Chief of Staff of the Army's *People First Strategy* (Stenson, 2021). With more than a decade of research data and studies, the Center for the Army Profession and Leadership (CAPL) pushed to develop, field, and incorporate programs such as Leader 180, a self and peer assessment, Leader 360 which includes input from the Soldier's subordinates, peers and superiors, Nelson Denny Reading Test, Criterion Online Writing Evaluation Service, Army Critical Thinking Test, as well as various self-assessments into constructing the current program (Stenson 2021).

## **PROBLEM DEFINITION**

### **Problem Statement**

United States Army Training and Doctrine Command (TRADOC) must address vulnerabilities to the Army's human capital advantage in order to meet the long-term needs of the Army Vision and avoid falling behind adversaries. The convergence of new and modern battlefields, transition to Multi-Domain Operations, emerging threats, and recognized gaps demand TRADOC adapt training, assessments, and methodologies to allow for greater reform and modernization of the Army's People.

### **Vulnerabilities**

In the decades since the end of the Cold War, the world has entered in a renewed period of competition (NGIC, 2020). Technology is advancing rapidly, becoming more complex and more accessible than ever before. Threats from emerging terror or extremist groups, supplement threats from near-peer adversaries, creating a multi-pronged challenge to national security (NGIC, 2020). Military operations are increasingly intertwined with and rely on a diverse group of agencies from across government and are executed in environments and in ways never seen before (TRADOC, 2018). And, despite relatively reliable defense spending, materiel modernization is not sufficient by itself to counter (Harrison et al., 2019). In sum, the emergence of a new power competition places an increased premium on human capital, decision making speed and ability, and efficient action. When the Army published *The United States Army in Multi-Domain Operations 2028*, it focused on the need for capable leaders to be able to apply modern lethality on a diverse set of battlefields (Palmer & Keller, 2019). However, vulnerabilities to this capable-human-capital capability exist both internal and external to the Army.

Soldiers and leaders, since the early 2000s, have been familiarized with a form of training and combat that, at times, challenged innovation in times of peace and adaption in times of war. Legacy mentalities of past readiness models permeate among many in the Army, inculcating training as a task, rather than a tool or mentality, starving Soldiers and leaders with innovation and adaptation skills. As the multi-domain environment becomes realized and technological advancements shows no signs of slowing, innovation coupled with adaptation will demand Soldiers change to new forms of warfare and, with that change, be forced to re-learn their craft within the context of their new environment (Palmer & Keller, 2019).

The challenge arises when confronted with new information, as future battlefield demands will surely present. "A Soldier has two options: route actions through previously established neural pathways, or create new pathways" (Palmer & Keller, 2019). The former risks brain wrongly categorizing what it perceives, linking a situation to something previously acted upon (Palmer & Keller, 2019). The latter takes time and energy—often a tall task. It is, however, true that repetition enables Soldiers to develop cognitive templates and save time and energy during decision-making (Palmer & Keller, 2019). But only when their ability is processed unconsciously can they possess instinctive intuition that creates the space for adaptive action in changing conditions (Harrison et al., 2019).

In the Iraq and Afghanistan campaigns, for example, non-traditional and ruthless forms of combat stifled traditional concepts of warfare that America Soldiers had initially trained for (Singer, 2012). The emergence of the Improvised Explosive Device (IED) is one such example that Soldiers were initially unprepared to compete with. While the IED is a materiel example, it points to the ingenuity, intricacy, and foregoing of combat principles that our enemies are willing to incorporate into their fighting and something the Army had to counter and compensate for (Singer, 2012). Because Army fighting doctrine incorporates, even seemingly prioritizes, moral and ethical combat, and economy of force (TRADOC, 2018), enemies who forgo this will often find the advantage, thus application of the IED. Even in an era where emerging capabilities and practices might not be guided by a universal set of ethics and guidelines, decision making speed and skill, and the ability to unconsciously adapt to solve problems are more crucial (Singer, 2012). The chance of being out-smarted or encountering situations in which the Army's human capital is over matched might be too great and warrants the deliberate overhaul of policies that obsessively prioritize what the enemy is doing to build and sustain their human capital (CAC-T, n.d.).

This report specifically identifies five categories of vulnerabilities that, in part, drive the importance and need to focus more on Army human capital:

- **Transition to Multi Domain Operations:** The multi-domain environment presents vulnerabilities that TRADOC must adequately train for and assess appropriately to attain the desired advantage for the Army now and for the future. These include but are not limited to talent management and cross-functional capabilities. "For the first time since the Second World War, it is likely that the U.S. could face a true strategic competitor who will have an ability to operate in domains outside of traditional air and land battle, deny domains to U.S Forces, and who will be able to operate with certain technological advantages over a U.S. Force" (TRADOC, 2019). Transitioning to this model of operations is further compounded by relying on coalition warfare that may not be able or willing to modernize at the same pace as the United States:

"The United States will face a situation where its strategic advantages held during the post-Cold War period, a broad network of alliances and partners that allowed for the forward deployment of a sophisticated, highly-capable joint force, will erode, allowing for increasingly aggressive challengers fielding a full-range of modern, advanced capabilities with hybrid strategies to challenge our ability to bring forces to the fight while undermining our political and national will to do so" (TRADOC, 2019).

While MDO focuses on adversaries' anti-access and area denial systems (A2/AD), because they deny the joint force its ability to prosecute combined arms maneuver, it highlights a wide knowledge and awareness gap among Soldiers and leaders. The ability of our joint force human capital to operate effectively in a MDO environment will thus be challenged by operational and tactical convergence, and optimization of a broader range of capabilities of which is underperformed or under-assessed in the present.

- **Emergence of Great Power Competition:** There exists an emergence of great power competition with near-peer adversaries, namely Russia and China, and other actors in Iran, North Korea, and VEOs. 2+3 actors are working towards carrying out hybrid strategies, as rapid innovation in key technologies increases (TRADOC, 2019).

Russia and China will likely be the U.S. prime pacing threats. Both are investing in new capabilities to overmatch U.S. capabilities and the U.S.'s ability to deploy into a decisive theater. In addition to new weapons systems, Russia is studying and investing in emerging technologies, such as robotics, advanced computing, hypersonics, space systems, as well as biological enhancements to human performance (TRADOC, 2019). China boasts practices of reverse engineering technologies it purchases or acquires through intellectual theft, a likely indicator that China will surpass Russia as the U.S.' most capable threat (TRADOC, 2019). North Korea and Iran continue to pose significant regional threats, each possessing unique capabilities to threaten the U.S. outside of its direct region: North Korea through ballistic missile program, nuclear weapons, and cyber capability, and Iran's reliance on proxies and state-sponsored terrorist infrastructure (TRADOC, 2019). Non-state actors, radical ideologues, and international criminal elements take advantage of similar factors nation-states have considered, yet combine them with a willingness to also depend on other, non-conventional capabilities to achieve their objectives (TRADOC, 2019). In sum, U.S. adversaries are resorting to other areas of competition below the threshold of war to achieve their ends incrementally, a changed complication in the way Soldiers and leader have traditionally thought of, evaluated, and prepared for conflict.

- Materiel modernization cannot solely counter: "Materiel modernization is not sufficient by itself to fight" (Palmer & Keller, 2019) the new and complex types of war that the U.S. will face, which demand the focus be on human capital—Soldiers and leaders, capable of applying modern lethality on a diverse set of battlefields. Investment in equipment not adequately supplemented with delivering knowledge to not only to employ, but employ creatively and decisively is challenging. This introduces the need for new learning, new thinking, and better ways to train and assess. These "new's" address a need to focus more on cognitive, competency, and awareness dimensions that adjust and adapt current models so that human capital will not be at or near deficient in the near future. Demanding the focus be on Soldiers and leaders additionally supplements a variety of qualitative feedback from commanders and the Army at-large that leaders at all echelons are recently recognizing a lack of focus on People, in garrison and in conflict.<sup>9</sup>

- Speed of science and technology integrated with human evolution: Technologies are no longer the exclusive preserve of the U.S. Adversaries may be able to acquire or develop capabilities to counter or defeat those fielded by the U.S., in part due to global interconnectedness and rapid, innovative commercial sector developments. Advanced technologies currently in development have the potential to disrupt the status quo and transform the character and operational tempo (OPTEMPO) of warfare by providing faster, data-driven decision-making (NGIC, 2020). Human factors, human-machine interaction, adherence to the laws of warfare, and cultural acceptance will now have a great impact, particularly for adversaries that may not be bound by moral or legal restrictions to which the U.S. is subject. While technological advancement and the character of warfare is one element to recognize, speed of technology must also recognize the inherent transition windows that exist prior to full

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<sup>9</sup> See III Corps and Fort Hood *Operation Phantom Action* (2020) issued in part due to a recognized gap in the installation's command climate and focus on People.

implementation, where people and organizations are at their most vulnerable by considering how to address them in the meantime.

- Gaps in Defense, Academia, and Industry Collaboration: Many non-military organizations and industries are also challenged by a world saturated in emerging complexities and operating in multi-domain environments. Recognizing gaps in collaborative efforts and knowledge sharing is acknowledging that there are missed opportunities for the Army to further modernize and capitalize on outside lessons learned. Innovation naturally happens through and exists within collaboration. “The best organizations harness innovation from their employees and *outsiders*—especially those from younger generations. True collaboration isn’t limited to doing one project every once in a while; it’s a sustained strategy which maximizes individual contribution while leveraging the collective intelligence of everyone involved” (Sladek, 2019). A key vulnerability manifests in a relatively self-imposed institutional barrier to knowledge sharing and development. By reducing said barrier, then sustaining a model of integration between defense, academia, and industry, the Army is likely to unlock and capitalize on a wider and deeper source of information, practices, and skillset that can be applied collectively to the challenges it will likely face.

## **EVALUATIVE CRITERIA**

### **Client Values:**

After a thorough literature review, the following criteria are used to evaluate the projected outcomes of the proposed policy alternatives. These criteria were evaluated as a means of addressing the challenges and vulnerabilities facing the Army and only as they apply to TRADOC's potential actions and influence.

### **Criterion 1: Effectiveness**

This report assesses effectiveness based on the widely used model of evaluating training effectiveness by Donald Kirkpatrick<sup>10</sup>. Kirkpatrick's model features four methods for evaluating training and developmental programs: reaction, knowledge, behavior, and results, though this report offers an adaptation to examine effectiveness in the Army context. The methods include: 1) reaction (measuring the Soldier's feelings toward a particular training or intervention), 2) knowledge (the extent to which Soldiers change attitudes, improve knowledge, and/or increases skill as a result), 3) behavior (measuring whether knowledge from a training activity is being transferred to actual job performance), and 4) results (a hybrid assessment of qualitative and quantitative metrics). To address human capital for TRADOC, this report assesses effectiveness in terms of the competitive advantage Soldiers would provide to the Army, at-large, on the following scale:

<b>Low Effectiveness (1)</b>	<b>Medium Effectiveness (2)</b>	<b>High Effectiveness (3)</b>
Unlikely to maintain or advance human capital qualitatively or quantitatively; noticeable status quo or negative trends via existing assessment methods, training scenarios, and performance; status quo or decline in perceived or assessed competitive advantage.	Somewhat successful; minimal increase in specified aspects of human capital assessments; positive and status quo trends via existing assessment methods, training scenarios, and performance; minimal or no change in perceived or assessed competitive advantage.	Reasonably successful at increasing the competitive advantage of Soldiers and leaders in a wide array of scenarios and complexities; noticeable positive trends in performance assessed via existing methods.

### **Criterion 2: Cost**

This report assesses cost based on projections of past estimates of similar interventions and the likelihood of increasing or decreasing TRADOC's or a joint-venture annual budget. This report recognizes that precise costs may be difficult to estimate given the high number of stakeholders, the complexity of TRADOC's budget, and domestic and global implications of defense spending. This report projects cost on the following scale:

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<sup>10</sup> See Smith, Eric, *Assessment of the Effectiveness of Development Activities*, 2012.



<b>Low-Cost (1)</b>	<b>Medium-Cost (2)</b>	<b>High-Cost (3)</b>
Expensive, not feasible given the cost of past programs and budgetary restrictions.	Somewhat cost burdensome, medium increase to current budget.	Reasonably cheap to implement. Does not substantively increase current unclassified budget.

### **Criterion 3: Feasibility**

This report assesses feasibility based on likelihood of support and adoption, estimated length of time to implement, the need to reallocate resources, and impact on other programs and initiatives. Feasibility will be extremely important to evaluating the quality of each alternative. The nature of the Army function, competing priorities, and Army strategy will heavily influence the likelihood of each alternative's adoption. This report assesses feasibility on the following scale:

<b>Low Feasibility (1)</b>	<b>Medium Feasibility (2)</b>	<b>High Feasibility (3)</b>
Unlikely to be adopted or succeed in the long-term; potentially threatens or over burdens other relevant programs and resource allocations.	Somewhat viable; may encounter issues with execution and compliance, minimal burden to existing or ongoing initiatives.	Reasonably viable; has had success with former iterations, likely to function given cultural, behavioral, and learning shifts in the Army.

### **Criterion 4: Cost-Effectiveness**

This report assesses cost-effectiveness based on the ranking of all alternatives. The ranking is assigned by considering the burden of cost disruption (high, low cost) and an assessment of effectiveness (high, low effectiveness) based on qualitative evaluations using a quad chart methodology. This report recognizes that cost effectiveness precision may be difficult to determine given the wide array of senior leader stakeholders, but finds it necessary to estimate the value of investment dollars per an evaluation of +/- "units of human capital." Assessment of alternatives with Low Effectiveness, regardless of Cost were awarded a value of "1" to maintain standardization. These estimates are bounded within literature and the author's research. This report projects cost-effectiveness on the following scale:

<b>Low-Cost Effectiveness (1)</b>	<b>Medium-Cost Effectiveness (2)</b>	<b>High-Cost Effectiveness (3)</b>
High Cost, Low Effectiveness OR Low Cost, Low Effectiveness	High Cost, High Effectiveness	Low Cost, High Effectiveness

### **Weighting the Criteria**

This report assigned a 40 percent weight to the Effectiveness criterion. Effectiveness was weighted most heavily given human capital represents one of two

asymmetric advantages and is prioritized first in the Army Vision. Cost is assigned a 20 percent weight, since the Department of Defense (DoD) budgetary process is complex, requires multiple levels of analysis and vetting, and allocated funds must serve a multitude of mission-sets. Feasibility is assigned a 30 percent weight, given the large number of stakeholders and the varied, unique initiatives ongoing to address this challenge. Finally, Cost-Effectiveness is assigned a 10 percent weight, given the qualitative nature of this evaluation and higher degree of error. In sum, assessing these criteria are qualitative in nature and marginally consider the quantitative information, since such information was scarcely available. Therefore, when determining a weighting and a weighted score, it is considered using a combination of literature, interviews and perspectives, and general narrative-based evidence for addressing the problem statement.

## **ALTERNATIVES AND EVALUATION**

This report will evaluate each alternative against the relevant criteria for the purpose of recommending the most preferable option to TRADOC. Five policy alternatives are considered: (1) Maintain the status quo, largely by allowing current initiatives to continue or by recognizing that current initiatives achieve satisfactory effectiveness to meet the Army's needs; (2) Establish a joint, non-materiel based Cross Functional Team (CFT) with focus on maintaining and developing human capital; (3) Institute a wider array of assessment programs aimed at lower levels of Command and leadership positions; (4) Field the Synthetic Training Environment (STE) in parallel to its development, while re-focusing and re-prioritizing its future applications; and (5) Targeted recruiting and retention initiative that combines redesigning baseline qualifications with more needs-based recruiting. Four criteria (Effectiveness, Cost, Feasibility, Cost-Effectiveness) are considered to evaluate the projected outcome of each alternative. These criteria were evaluated as a means of addressing the challenges and vulnerabilities facing the Army and only as they apply to TRADOC's potential actions and influence.

### **Evaluating the Policy Alternatives**

#### ***Alternative 1: Status Quo***

This alternative maintains TRADOC's (and the Army's) current human capital approach with a guiding principle centered on the Army's ability to operate in multi-domain and complex environments while striving to gain and retain talent. See *Figure 6*. TRADOC and its subordinate CAC, CAPL, and Centers of Excellence (CoE), continue to solicit research, feedback, and apply manpower and effort to build Force capability for environments of chaos and ambiguity, while striving towards customized learning programs and career management. Current assessments and initiatives, for example, *Project Athena*, annual surveys, and leadership and lethality training models at PME sites, and at echelon, continue to inform and cultivate human capital in a way the serves the Army function and contributes to the national interest.

- *Effectiveness*: This alternative received a score of 1 for effectiveness. Using the Kirkpatrick model of four methods, it is likely that TRADOC identified and is incorporating elements through ongoing initiatives that target Soldier knowledge, generating more favorable results-based assessments in the areas of concern and senior leader priorities. What is unclear, is whether these initiatives adequately target the knowledge and behavior components of the four methods, where current program goals correlate to a positive change in actual performance or Soldier reaction. This would better indicate whether current efforts are valid for long term implementation.

- *Cost*: This alternative received a score of 3 for cost. This assessment is made based on the assumption that funding allocation and general budget management undergoes an extensive review process in order to determine the practicality of each dollar spent. It is estimated that this alternative will provide minimal impact to current budget requirements given the interconnectedness of ways and means previously sought out by TRADOC in its development programs.

- *Feasibility*: This alternative received a score of 3 for feasibility. The wide array

of stakeholders and the building upon previous TRADOC initiatives indicate high feasibility. Additionally, shifts in learning needs and methods are clearly articulated in the *Army People Strategy* and Army Doctrine Publication (ADP) 6-22 *Army Leadership and the Profession* and describe what leaders should be and do while accounting for the minor generational and environmental context changes. This alternative is likely to function given the existing cultural and behavioral foundations of the Army.

- **Cost-Effectiveness:** This alternative received a score of 1 for cost effectiveness. Using a quad chart model for assessing cost to effectiveness, this alternative is seen as low cost or with low impact given its implementation likely conforms within existing budgets, but low effectiveness compared to the other alternatives discussed further.

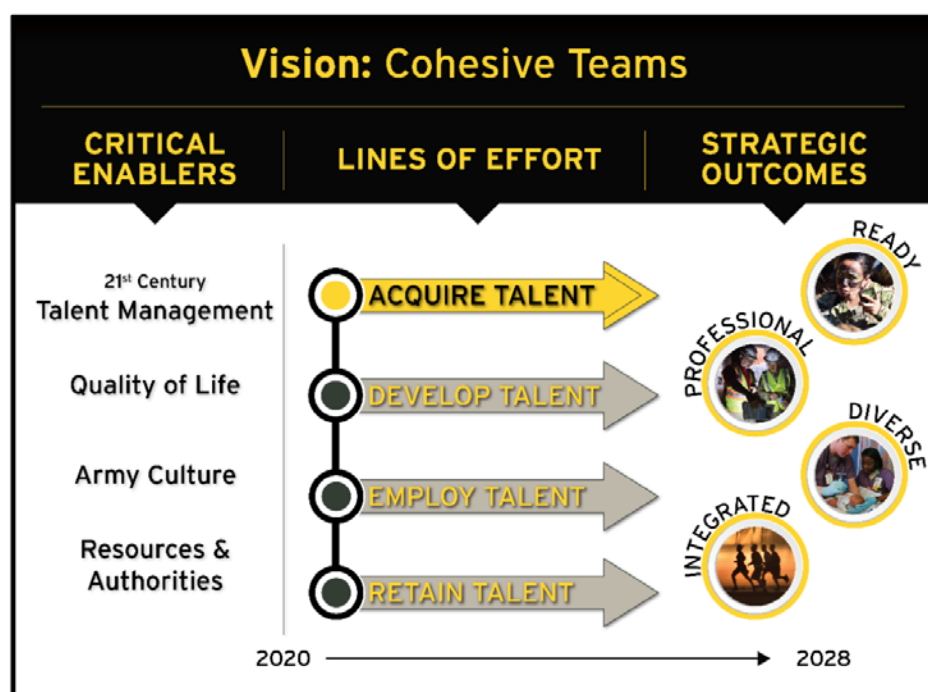


Figure 6. The Army People Strategy 2019: Strategic Approach through 2028 (Headquarters, Department of the Army, 2019)

### **Alternative 2: Human Capital Modernization Cross Functional Team**

This alternative establishes new, specialized CFT in a joint venture led by TRADOC, as a force *generating* entity and with Army Futures Command (AFC), as a force *projecting* entity. In its capacity, this CFT would serve as the first non-materiel based and focused cross functional team, named the *Human Capital Modernization Cross Functional Team (HCM-CFT)*, that proactively builds on the circular relationship between Defense, Private Sector/Industry, and Academia to operationalize a model of inter- and intra- data sharing, domain expertise, and implementation practices to address human capital and human capital gaps at its present and for the future, continuously. Through stable defense funding and data sharing, both academia and industry help bring together large volumes of qualitative and quantitative feedback and assessments gathered and housed at various Army institutions, analyze trends against defense and social issues, and engage in simulations that test, then evaluate Army expectations of Soldier competency and knowledge-skills-behaviors (KSB), within the expectations of the Army's future needs. Additionally, this alternative capitalizes on a

broad catalog of past and ongoing literature and research that provides comparable models (industry, foreign military, other private sectors) for success (and failure) in multi-domain and disruptive environments. This alternative is TRADOC initiated, TRADOC led, with AFC applying its founding organizational expertise to solve future challenges while being concretely involved in the organizational structure. This alternative aims to centralize the effort on the number one Army priority and primary strategic tenet—People. This initiative reduces administrative barriers and narrows the gap in partnership processes, modernization, and capitalizes on lessons learned from inside and outside the Army community to encourage long-term, solutions-based work between TRADOC, AFC, industry, and academia. Further, as an established CFT with reporting requirements to the Office of the Chief of Staff of the Army, this initiative makes resourcing and collaboration more fluid in order to invest in long-term research relevant to Army interests and ensure continuity of the human capital discussion by enabling awareness of potential gaps and transition periods.

- *Effectiveness:* This alternative received a score of 3 for effectiveness. Using the Kirkpatrick model of four methods, this alternative target's reaction, knowledge, behavior, and results with measurable resources against measurable outputs that build on the circular relationship between Defense, Private Sector and Industry, and Academia to operationalize a system of sharing and innovation. Establishing a CFT prioritizes human capital in a more central manner by providing a holistic understanding of what *does* and *will* challenge employing People across an increasing array of problem sets, and can set the foundation to underwrite other future endeavors. This alternative further addresses barriers to information sharing and collaboration that have created a gap between defense and industry or academia models and lessons learned, increasing stakeholder buy-in and advancing a multi-faceted approach which focuses on the desire to adapt rather than react.

- *Cost:* This alternative received a score of 2 for cost. While the creation and function of a new CFT is somewhat cost burdensome, it can likely operate under the sponsorship of both TRADOC and AFC, where AFC holds eight materiel-based CFTs currently.

- *Feasibility:* This alternative received a score of 2 for feasibility. While this option has the potential to be viable and focused for the long-term, it is assessed that execution, compliance, and sustainment will prove burdensome to existing and ongoing initiatives. This alternative presents an increased risk for redundant efforts to operate decentralized and likely conflicts with the organizational function of similar entities in CAC or Army Research Institute (ARI).

- *Cost-Effectiveness:* This alternative received a score of 3 for cost-effectiveness. Using a quad chart model for assessing cost to effectiveness, a non-materiel, human dimensioned focused CFT is seen as medium cost given its implementation would not overly exacerbate existing funding, but high effectiveness by giving continuity to the human capital discussion and allowing for the integration of future goals with human capital focus areas under a single functional team.

### ***Alternative 3: Company Commander and First Sergeant Assessment Programs***

This alternative builds on the Battalion Commander Assessment Program (BCAP) and Colonels Command Assessment Program (CCAP) model by applying it at

the Company Command (Captain, O-3) level, and using the prototype Sergeants Major Assessment Program (SMAP) by applying it at the First Sergeant (E-8) level. This alternative augments existing developmental, predictive, and self-assessment tools and initiatives to assess, then decides on the best way to manage talent, while providing a system that continuously cultivates human capital and assesses it, formally, as early as possible. This alternative accomplishes four things. First, a Company Command-level and First Sergeant Assessment Program drives the Army's importance on fitness for command and strategic leadership earlier in one's career. Since the responsibilities and authorities associated with Company Commanders and First Sergeants shape much of how Army forces train, fight, and win, it serves to elevate the importance of placement to a much higher level. Second, in conjunction with self-developmental initiatives, such as *Project Athena*, a Company Command-level and First Sergeant Assessment Program extends the impact of change the Army needs to compete in a modern environment to the lowest level of formal authority, and provides both TRADOC and leaders a more holistic foundation to adapt when necessary. Third, BCAP and CCAP make the unique effort to create an even playing field and the opportunity to confirm or reorganize the Centralized Selection List (CSL) Board-generated Order of Merit List (OML). This alternative aims to do the same. A Company Command-level and First Sergeant Assessment Program informs future Senior Commanders and Senior Command Sergeants Major who are slating Company Commanders and First Sergeants, ensuring that 1) queues minimally impact quality, and 2) Soldiers, as best as possible, are receiving leadership when it can be the most direct and impactful. Finally, this alternative addresses cognitive, non-cognitive, and physical assessments that would challenge TRADOC to increase its focus into initial military and pre-commissioning training models and human capital acquisition. TRADOC led, this alternative would be conducted at Captains Career Courses (CCC) and Senior Leader Course (SLC) or Master Leader Course (MLC), similarly in line with the assessment time of Battalion Commanders and Colonels before they assume position.

- *Effectiveness*: This alternative received a score of 2 for effectiveness. Using the Kirkpatrick model of four methods, this alternative builds on TRADOC identified focus areas for testing and evaluating leadership and competency at the command level. By augmenting existing developmental, predictive, and self-assessment tools and initiatives to assess, then deciding on the best way to manage talent, this alternative offers a system that continuously cultivates human capital and assesses it, formally, as early in a Soldier's career as possible. In assessing Company Command and First Sergeant level leaders, this alternative extends the impact of change the Army needs to the lowest level of formal authority, but might fail to be measurably effective to the larger Army population.

- *Cost*: This alternative received a score of 3 for cost. This assessment is made based on the expectation that forecasted funding for BCAP and CCAP execution will be relatively stable. This alternative can likely be executed co-located at PME sites and require minimal costs to sustain. It is assumed that the quantity of candidates screened would confirm the option to forego off-site assessments (vs. centrally located at Fort Knox for BCAP and CCAP) thus making cost a minimal factor for consideration

- *Feasibility*: This alternative received a score of 2 for feasibility. While viable

and easier to implement compared to other alternatives, its adoption is likely to encounter challenges. Most prominently, assessing younger Officers with ~four years' time in service, may prove to provide unwarranted or unnecessary indications this early in an Officer's career.

- *Cost-Effectiveness:* This alternative received a score of 2 for cost effectiveness. Using a quad chart model for assessing cost to effectiveness, this alternative is seen as low cost given its implementation costs would be minimally impacted compared to the relative costs for the various PMEs, but medium effectiveness given its bounded application at the O-3 and E-8 levels.

#### ***Alternative 4: Synthetic Training Environment Application and Re-Focus***

This alternative fields the functionalities of the STE in an incremental fashion, parallel its development and continuously throughout the development process, while focusing future design and advancements that incorporate and assess cognitive, ethical, moral scenarios within tactical situations or as stand-alone training. Through scaled roll-out, flexible maintainers, and development-for-development upgrading, the STE, ideally, would be fielded at Basic Officer Leaders Courses (BOLC) and Basic Combat Training (BCT) sites. As a tool, the STE provides the opportunity for Soldiers to engage with new technologies, become familiar with STE usage and applications, orient themselves to augmenting live training (primary approach) with virtual, and better mitigate the MDO transition gaps that STE creates while it is in development. To achieve training dominance, training must be flexible, relevant, and repeatable in order to modernize capability on the battlefield and increase Soldier lethality. By integrating STE functionality into training now and throughout, there will be less of a learning curve, through repetition, to achieve, then maintain skill and troubleshoot in the system. Soldiers and leaders will be able to build upon the way they think about and plan training, learning as STE is developed in parallel, and in doing so, can fundamentally rewrite the thinking of training as a tool, rather than a task list. Secondly, this alternative re-focuses TRADOC's input on STE's ultimate end state. The Army, at-large, makes it clear that investments in People have the potential to at least maintain, even widen the advantage for the U.S., relative its adversaries. STE applications that directly target this from a psychological and ergonomic view point stand to amplify those effects. Challenges in an evolving environment point to a need for research and development in STE capabilities and scenarios that train and assess Soldiers in cognitive, ethical, and moral situations, as well as tactical. This initiative challenges TRADOC to invest in the development of hybrid cognitive, moral, and ethics training that can be applied to the unique missions of the Armed Forces. By spearheading a change in the adaptability of the STE vision, TRADOC promotes greater awareness to the cognitive, ethical, and moral capability necessary for the Army function, boosts morale so that Soldiers work more effectively creating cohesive teams, and gives the Army a repeatable, flexible platform to alter problem solving and decision-making opportunities within environments of change. The STE then becomes the synthesis of a hybrid approach to training, giving Soldiers and leaders both objective and subjective data, trends, and feedback.

- *Effectiveness:* This alternative received a score of 3 for effectiveness. Using the Kirkpatrick model of four methods, this alternative comprehensively targets reaction, knowledge, behavior, and results by generating training and assessment outputs on an

increasingly adaptable platform. STE demonstrates the potential to not only modernize training scenarios with an increased focus on multi-domain complexities, but demonstrates that future applications can include the focus on competency, cognitive, moral, and ethics training combined with tactical scenarios to provide a flexible platform for problem solving and decision-making opportunities within environments of change. Additionally, by fielding functionalities as they stand and throughout, the STE serves to lessen learning curves and fundamentally rewrite the thinking of training as a tool, rather than a task list.

- **Cost:** This alternative received a score of 1 for cost. Fielding STE incrementally, with sufficient maintainers, and with development-for-development upgrades in concert with long-term contractual changes to STE's functionality goals would represent a substantial increase in costs. In an unclassified March 2019 RDT&E Line-Item Justification report, STE was anticipated to cost the Army approximately \$335 million over a seven-year period, with base costs spent in FY18-20 totaling \$286 million (Department of the Army, 2019). These costs do not reflect continuous maintenance, upgrades, or the cost of contract operators. It can be estimated that massive overhauls to the STE end state, including roll-out to the Army now, could equate to at least one half to two thirds the initial investment, possibly more.

- **Feasibility:** This alternative received a score of 2 for feasibility. While this option has the potential to be viable and is an investment in long-term adaptability to meet the Army's needs, it is assessed that execution and sustainment will prove burdensome to existing and ongoing initiatives. This alternative presents an increased risk for substantial budget increases and might hinder the to-date progress of STE to meet the minimal requirements the Army has contracted for.

- **Cost-Effectiveness:** This alternative received a score of 2 for cost effectiveness. Using a quad chart model for assessing cost to effectiveness, fielding the functionalities of the STE now and continuously throughout the development process, while refocusing future design efforts is seen as high cost given logistical and contracting concerns, but high effectiveness by providing increased functionality to train and assess a wider variety of scenarios within tactical situations or as stand-alone options.

### ***Alternative 5: Personnel Management Initiative***

This alternative combines recruiting with retention to redesign baseline examinations of competency, cognition, and developmental abilities (as a precursor to enlistment or commissioning), with intra-service in/out status changes to increase the quantity and quality of candidates. This initiative is conceptualized in TRADOC and United States Army Human Resources Command (HRC) and executed within United States Army Recruiting Command (USAREC) and its recruiting teams and United States Army Cadet Command (USACC), offering a fundamental trade off in current needs for future needs. First, this alternative challenges the Army, TRADOC and its subordinate USAREC and USACC to re-examine the caliber of recruit it wants to serve as a part of the Army's function. This thinking re-writes, rather than build on, the list of qualifications and skills the Army hopes to see in its formations. Greater prominence on critical thinking, creative and competent decision making, adaptability in chaos and ambiguity, and self-awareness, for example, change the traditional views that many



hold on key Soldier skills that have dominated recruitment previously. Second, the alternative stands to give TRADOC, Soldiers from a much larger and diverse pool of candidates if the Army considers the ease in which service statuses can change. Soldiers with the ability to seamlessly flow between the Active Component, Reserves, and National Guard bring into the fold a larger quantity of Silicon Valley, private industry, and professionally degreed individuals that grow capability and raise the capital of personnel for Army missions. Service becomes more accessible, and ideally, more desirable to a wider array of individuals with crucial skills and abilities that the Army wants.

- *Effectiveness:* This alternative received a score of 1 for effectiveness. Using the Kirkpatrick model of four methods, it is likely that TRADOC and HRC identified and are coordinating changing methodologies with USAREC and/or USACC. In-progress recommendations have included a re-assessment of the Armed Services Vocational Aptitude Battery (ASVAB), as well as increased research into identifying the attributes required for a 2028 Multi-Domain Capable Force. This alternative, however, targets acquiring talent more singularly, while less directly addressing training and development for the nearly 1.1 million Active, Reserve, and National Guard Soldiers already serving. What is further unclear, is whether an initiative of this magnitude adequately targets the behavior component of the four methods, addressing the need for new skillsets that is under articulated.

- *Cost:* This alternative received a score of 3 for cost. This assessment is made based on the expectation that only procedural shifts in the recruiting and retention models, combined with a refinement of qualifications for specific recruiters working towards specific Army goals, meet the alternative's intent. It is estimated that this alternative will incur minimal change to current budget requirements.

- *Feasibility:* This alternative received a score of 3 for feasibility. This assessment is made based on the expectation for minor procedural changes in the recruiting and retention models to meet the alternative's intent. This alternative is likely to function given the existing cultural and behavioral foundations of the Army.

- *Cost-Effectiveness:* This alternative received a score of 1 for cost effectiveness. Using a quad chart model for assessing cost to effectiveness, this alternative is seen as low cost given its implementation likely conforms within existing budgets or with negligible impact, but low effectiveness given the smaller target audience and compared to the other alternatives discussed.

## **OUTCOMES MATRIX**

The following outcomes matrix generates scores and assesses each alternative against the proposed criteria. Each alternative is given a ranking between 1 and 3 to ensure standardized interpretation across each criterion.

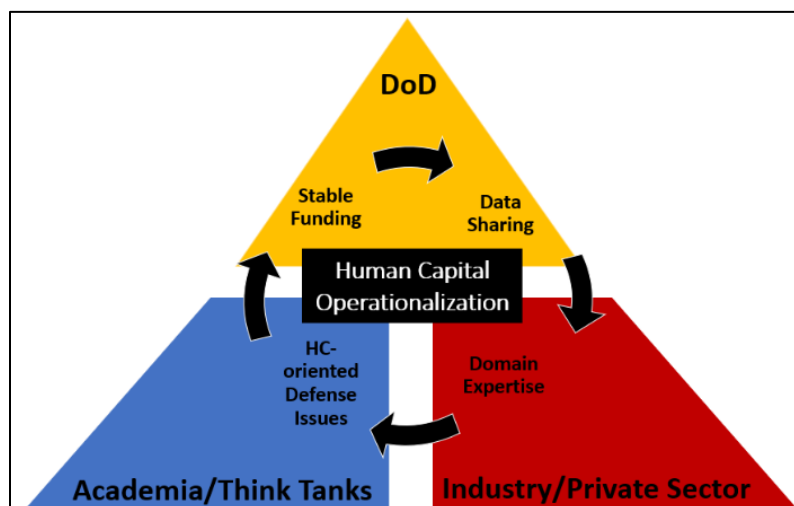
Assessment of Alternatives and Outcomes Matrix				
Alternative 1: Status Quo				
Criteria	Rating	Weight	Weighted Score	Overall Score
Effectiveness	1	.40	.40	2/3
Cost	3	.20	.60	
Feasibility	3	.30	.90	
Cost-Effectiveness	1	.10	.10	
Alternative 2: Human Capital Modernization Cross Functional Team				
Criteria	Rating	Weight	Weighted Score	Overall Score
Effectiveness	3	.40	1.20	2.50/3
Cost	2	.20	.40	
Feasibility	2	.30	.60	
Cost-Effectiveness	3	.10	.30	
Alternative 3: Company Commander and First Sergeant Assessment Programs				
Criteria	Rating	Weight	Weighted Score	Overall Score
Effectiveness	2	.40	.80	2.20/3
Cost	3	.20	.60	
Feasibility	2	.30	.60	
Cost-Effectiveness	2	.10	.20	
Alternative 4: Synthetic Training Environment Application and Re-Focus				
Criteria	Rating	Weight	Weighted Score	Overall Score
Effectiveness	3	.40	1.20	2.20/3
Cost	1	.20	.20	
Feasibility	2	.30	.60	
Cost-Effectiveness	2	.10	.20	
Alternative 5: Personnel Management Initiative				
Criteria	Rating	Weight	Weighted Score	Overall Score
Effectiveness	1	.40	.40	2/3
Cost	3	.20	.60	
Feasibility	3	.30	.90	
Cost-Effectiveness	1	.10	.10	

## **RECOMMENDATION**

Based on the above research, evaluation, and outcomes matrix *this report recommends that TRADOC establish a joint, non-materiel based Human Capital Modernization Cross Functional Team*. This alternative requires relatively moderate funding and resources, but minimal changes to how cross-functional teams currently operate, and instead refocusing and reprioritizing human capital on a more projected scale. This alternative provides the foundation to underwrite many future and more adaptive endeavors (include components of other mentioned alternatives) that more specifically target emerging needs to train and assess human capital, yet does not isolate the potential for human capital training and assessment to a specific group of Soldiers. The trade-off with this alternative is likely feasibility due to the requirement that TRADOC initiates and leads HCM-CFT, and centralizes the future challenges efforts being worked by AFC. A trade-off of this magnitude indicates that increased coordination to reduce barriers and narrow partnership gaps must be applied to ensure success. This, however, can be most likely be mitigated through an engagement strategy and top-down involvement where the unique focus on human capital is prioritized in word and practice, relative to other Army priorities. Ideally, this motivates, then carries forward the dialogue in TRADOC's advancement of Army goals and manages the risk and uncertainties in the emerging complex environments Army People will serve.

## **IMPLEMENTATION GUIDANCE AND LIMITATIONS**

Effective implementation of a *Human Capital Modernization Cross Functional Team* requires a formal, effective, and sustainable governance process. While this recommendation is advanced and led by TRADOC, it requires the creation of a



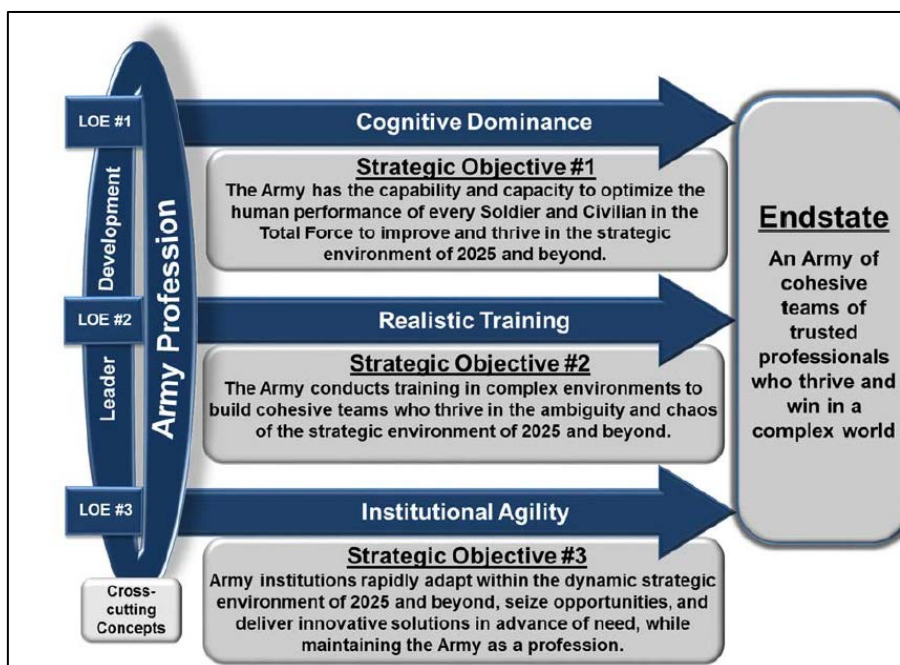
**Figure 7. Triangle collaboration with cyclical emphasis**

sustainable and codified relationship between TRADOC and AFC. To accomplish this, formal direction, codified in HQDA policy or as a part of a larger Army strategy document must receive the input and endorsement of both senior TRADOC and AFC Commanders, with the support of Army senior leaders within the DoD hierarchy. This recommendation is best implemented gradually, with the goal to centralize the

myriad of unique and parallel mechanisms within TRADOC and its subordinate units, with more specialized units who focus on human capital, and AFC's future outlook

efforts. A key to implementation will likely require the restructuring of reporting chains and information flow in preparation for future relationships with non-military entities. Upon the initial establishment of administrative systems, the ability to sustain implementation (and the human capital endeavor at-large) must include a clear understanding, under TRADOC direction, of both TRADOC's and AFC's responsibilities in training and modernization. While it is generally understood that TRADOC is responsible for the Army's training, modernization, and capability from the current to plus eight-years and AFC leads the modernization effort in concepts, capabilities and organizational structures from plus fifteen-years to plus thirty-years, clear policy must dictate the blending of priorities, investment, and effort on human capital in the intermediary plus eight to fifteen years, as this period is often less clear. Once integration, lines of effort, and priorities are set and understood, TRADOC could take more deliberate actions to integrate elements of academia and industry.

Ideally, this only begins the dialogue around human capital modernization and aims to continue, but sustain, the discussion on this topic. This report concurs that the *2015 Army Human Dimension Strategy*<sup>11</sup> identified the two most critical risks to implementing any kind of model to train and modernize human capital and maintains



**Figure 8. The Army Human Dimension Strategy 2015:  
Strategic Approach  
(Headquarters, Department of the Army, 2015)**

that they likely still hold true in any future considerations. First, a continued “lack of shared understanding and a common operating picture of ongoing human dimension efforts may result in further redundant and unfocused human dimension programs that are ill-suited to the requirements of the operational force and do not fully optimize limited” (Headquarters, Department of the Army, 2015). Second, a “lack of unity of effort could result in

meeting exacerbated challenges optimized for yesterday's strategic environment and threats” (Headquarters, Department of the Army, 2015). Further, this recommendation recognizes the unforeseen complexities in establishing a centralized human capital modernization effort. *HCM-CFT* will likely take several years to achieve a satisfactory

<sup>11</sup> TP 525-3-7-01, The U.S. Army Study of the Human Dimension in the Future 2015-2024, and, TP 525-3-7, The Army Human Dimension Concept, to best knowledge, have since been rescinded.

level of effectiveness due in part, to its overarching vision to incorporate multiple existing initiatives and underwrite future and other adaptive endeavors that specifically target emerging needs.

It is limited within the scope of this report to further elaborate on a detailed implementation strategy. This assertion is based on several criterion where analysis is absent, namely the inability to quantitatively provide essential data and research, either via open-source or by the Army and TRADOC, to ascertain true cost, feasibility to implement, and most importantly, the benefits associating with pursuing this recommended endeavor. This issue, however, is prevalent across many areas that integrate elements of the social sciences into organizational practices. Nevertheless, this limitation does not negate the usefulness of dialogue and the centralization of human capital development to address the vulnerabilities challenging our Army as a whole, but rather labors a patient investment for long term strategic gain. To supplement a limited implementation strategy, two important considerations have resonated throughout this project and are offered to serve as guiding principles for any future development. First, the key to change is being able to sustain it. "The Army must take full advantage of the time it has to prepare for future conflicts, especially to prepare Soldiers and who must improve and thrive in ambiguity and chaos" (Headquarters, Department of the Army, 2015). And finally, "Remember, training is a journey, not a destination. Through the training and building experience in the operational force, we will regain this important proficiency" (Funk, 2020).

## **APPENDIX A—Methodology**

The findings in this report are based entirely upon open source or “Approved for Public Release” information that informed context, assumptions, evaluations, and alternatives. The findings combine a review of existing qualitative literature and current and previous doctrine and training pamphlets. I made use of the online resources available through the University of Virginia (UVA) Library, TRADOC Headquarters and Combined Arms Research libraries, and Mad Scientist Laboratory<sup>12</sup> blog. I also used reliable news and magazine articles about military training and assessments, congressional reports on relevant topics, reports published in reputable journals, and national security think-tanks. Regarding the parallel, foreign, and non-military sources, I took great care to ensure authenticity by enlisting the librarian services at the TRADOC Headquarters Library. As per the evolving COVID-19 guidelines published at the Army, TRADOC, State, Local, and UVA levels, interviews were conducted utilizing email correspondence and telephonic or video-conference methods. Each interviewee was briefed on the structure and purpose of the project and was advised that attribution of the discussion would only be noted in the project if the interviewee provided verbal or written consent. The report does not provide identifying information if the interviewee did not provide consent. I also presented an opportunity for interviewees to address other relevant areas of their choosing or recommendations for action based on the focus areas.

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<sup>12</sup> The Mad Scientist Laboratory blog is a marketplace of ideas about the future of society, work, and conflict. “Mad Scientist is a U.S. Army initiative and a community of action that continually explores the future through collaborative partnerships and continuous dialogue with academia, industry and government” (TRADOC, 2021).

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