Spring 2020
Industry Study

Final Report
Strategic Human Capital

The Dwight D. Eisenhower School for National Security and Resource Strategy
National Defense University
Fort Lesley J. McNair, Washington, D.C. 20319-5062

25-P-0150

STRATEGIC HUMAN CAPITAL INDUSTRY STUDY 2020

ABSTRACT: The Strategic Human Capital Industry Study was launched in January 2020 as a new component of the Industry Study Program of the Dwight D. Eisenhower School for National Security and Resource Strategy. Strategic Human Capital clearly is a "domain," not an industry per se. It cuts across all industries and in fact across all organizations, public and private. Human capital is (a) an element and an instrument of national power, (b) a key contributor to public- and private-sector organizational performance, (c) a vital component of industrial and economic performance, (d) an important indicator of strategic competitiveness, and (e) a central element in America's mobilization posture. Strategic human capital is the aggregation and application of workforce knowledge, skills, abilities, aptitudes, talents, experience, and expertise to strategic aims and concerns. The Strategic Human Capital Industry Study has focused on (a) the various public- and private-sector stakeholders, national and international, who supply, demand, and utilize human resources in the conduct of routine and emergency national security affairs; (b) the national and international conditions and trends that affect and are affected by human resource availability and capabilities in the realm of national security; and (c) the actual supply of and demand for human resources and capabilities across sectors under routine and emergency national security conditions. The overarching aim of the Industry Study has been to assess the importance/impact of human capital in contributing to/determining U.S. and international industrial and economic competitiveness. What has resulted is a reaffirmation that strategic human capital's strength is its centrality in ensuring national security, contributing to economic vitality and competitiveness, and enabling the effective exercise of national power; conversely, its absence can almost inevitably and invariably produce vulnerability across virtually every societal domain.

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Organizations Engaged

Federal Government

American Workforce Policy Advisory Board
Centers for Disease Control and Prevention
Defense Business Board
Department of Defense
- Chief Civilian Human Capital Officer
- Director, Military Personnel Policy

Department of Homeland Security
- Deputy Chief Human Capital Officer

Department of State
- Deputy Chief Human Capital Officer

Federal Emergency Management Agency
- Chief Human Capital Officer
- Federal Disaster Recovery Officer

Office of the Director of National Intelligence
- Chief Human Capital Officer

U.S. Agency for International Development
- Chief Human Capital Officer

U.S. Bureau of Labor Statistics
U.S. Customs and Border Protection
U.S. Government Accountability Office
U.S. Office of Management & Budget

U.S./Allied Military

Allied Command Transformation (NATO)
U.S. Africa Command J-1
U.S. European Command J-1
U.S. Northern Command
U.S. Space Command
U.S. Special Operations Command Europe J-1

International Organizations

Embassy of Switzerland in the United States
German-American Chamber of Commerce
International Chamber of Commerce
International Labor Organization
International Organization for Migration
International Organization for Standardization
International Organization of Employers
Organization for Economic Cooperation & Development
United Nations, Department of Sustainable Development Goals
United Nations, Department of Operational Support
United Nations, Department of Peacekeeping Operations
United Nations Development Program (Crisis Bureau)
United Nations Educational, Scientific, and Cultural Organization
United Nations Global Compact
United Nations High Commissioner for Refugees
World Bank
World Business Council for Sustainable Development

Colleges/Universities/Think Tanks

Aspen Institute Future of Work
Aspen Institute Upskill America
Center for Economic and Policy Research
Committee for Economic Development
George Mason University
Johns Hopkins University Applied Physics Lab
Montgomery College
Northern Virginia Community College

Business/Human Resources Community

AFL-CIO
American Association of Community Colleges
Association for Talent Development
Business Roundtable
Capital CoLab/Greater Washington Partnership
Center for Human Capital Innovation
National Association of Colleges and Employers
National Association of Manufacturers
National Federation of Independent Business
National Skills Coalition
Society for Human Resource Management
Virginia Career Works Northern Region

Private Firms

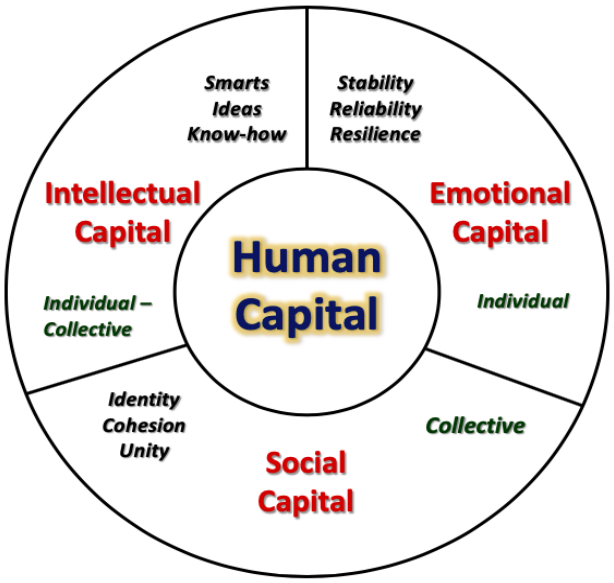
ABB Group
Accenture plc
BAE Systems Inc.
Bechtel Corp.
Booz Allen Hamilton Inc.
CACI International Inc.
CDM Smith
Chemonics International Inc.
Deloitte Touche Tohmatsu Ltd.
DynCorp International Corp.
Fluor Corp.
Huntington Ingalls Industries
IBM Corp.
Jacobs Engineering Group Inc.
Korn Ferry Inc.
Leidos Corp.
Louis Berger Group/WSP Global
ManTech International Corp.
McKinsey & Company
Mitre Corporation
PAE (Pacific Architects & Engineers) Corp.
Science Applications International Corp.
Tetra Tech Inc.
Veolia Environnement S.A.

"Only by providing leading-edge human capital and knowledge capital can America continue to maintain a high standard of living, including providing national security for its citizens."[1]

– Norman Augustine, Former CEO, Lockheed Martin Corporation and Under Secretary of the U.S. Army

Although strategic human capital (hereafter SHC) lacks a universally accepted definition, it is vitally important to national security and reflects several common themes across most definitional attempts.[2] As Dartmouth College policy fellow Charles Wheelan has suggested, "Human capital is the sum total of skills embodied within an individual: education, intelligence, charisma, creativity, work experience, entrepreneurial vigor [and] is what you would be left with if someone stripped away all of your assets – your job, your money, your home, your possessions, and left you on a street corner with only the clothes on your back."[3] Figure 1 seeks to capture the components and relationships embodied in such human capital conceptions.

Figure 1. Core Components of Human Capital



Translating such a conception to the national level, one sees that SHC may be considered a nation's (or an organization's) composite wealth in terms of its macroscopic, future-oriented approach to educating and training its people; leveraging its public and private sector resources to bolster resourcefulness and innovativeness; anticipating future challenges and opportunities; harnessing the sum total of its peoples' knowledge, skills, and abilities; and having the policies and accountability in place to actualize these endeavors.[4] Indeed, the human element of SHC can readily be viewed as the quintessence of a nation's (or an organization's) strategic competitiveness.

Despite definitional differences, many of the subject-matter experts this Industry Study has interacted with corroborate several recurrent themes that are particularly salient to the study of SHC today: (1) Human capital shortfalls and requirements need to be clearly elucidated before they can be fixed. (2) Artificial intelligence, automation, education (with emphasis on science, technology, engineering, and mathematics [STEM] and trade skills) are *the* driving and expanding SHC imperatives. (3) SHC should be considered intrinsic, not ancillary, to national security and long-term strategy. (4) SHC-related policies,

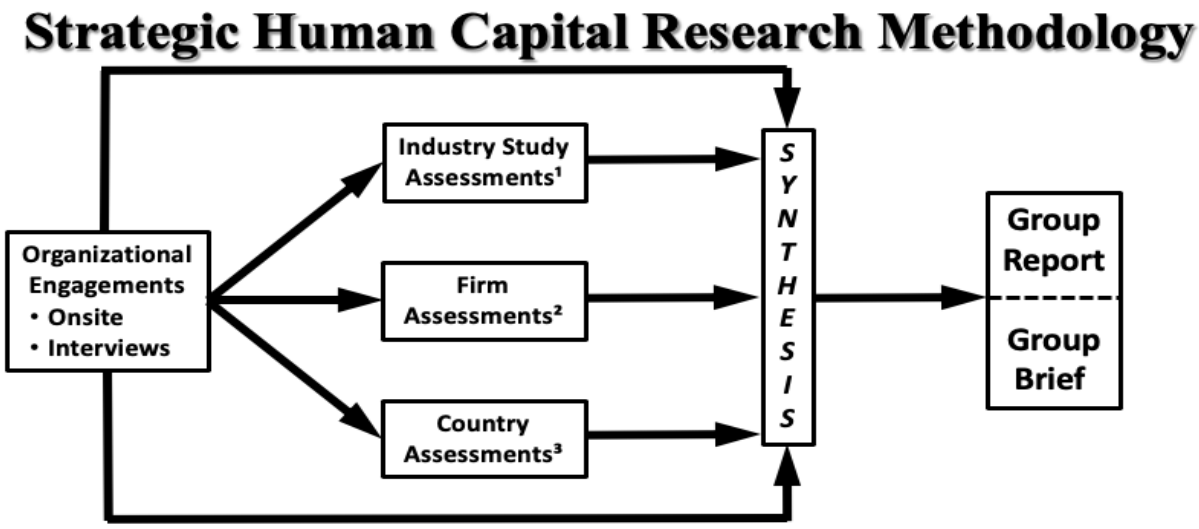
programs, priorities, and partnerships warrant clarification and dialogue with decisonmakers and planners prior to enactment.

Thesis and Research Methodology

Despite a national-security imperative that focuses on great-power competition between the United States and its rivals China and Russia, this Industry Study contends that a more immediate power competition exists within our own backyard. It is a fight for scarce talent, a fight for the right people with the right skills, a fight to optimize both the capacity and capability of the workforce across the entire nation, a fight to sustain and appropriately tailor the workforce as global situations unfold.

This study employed an analytical framework that sought to synthesize and integrate findings from a broad range of organizational engagements, industry study assessments, firm assessments, and country assessments that collectively represent the key stakeholders in the SHC-national security "ecosystem" (Figure 2).

Figure 2. Approach to Studying Strategic Human Capital Relative to National Security



[1]Air Domain – Biotech – C4ISR – Cyber – EW – Emerging Tech – Energy – Global Agility – Land Domain – Missile Defense – Munitions – Nuclear Triad – Organic Industrial Base – Sea Domain – Space – Strategic Materials – Undersea Domain: *What is the specific industry/sector focus? How important is human capital (and associated concerns: e.g., education/training, skilling/reskilling, talent management) to the industry? What specific human capital concerns are addressed? Why (e.g., competitiveness? mobilization preparedness? technology change?)? What human capital-related policy recommendations does the industry consider/advocate?*

[2]Accenture – BAE North America – Bechtel – Booz Allen Hamilton – CACI Int'l – CDM Smith – Chemonics – DynCorp – Fluor – Huntington Ingalls – Jacobs – Leidos – Louis Berger – ManTech Int'l – PAE – SAIC – TetraTech: *How important are human capital/workforce development/talent management concerns to the company? Why? What is the company's underlying human capital/workforce development/ talent management philosophy? To what extent does the company view human capital as a principal source of competitive advantage vis-à-vis both competitors and government? What procedures/practices does the company have in place under normal operating circumstances for managing (recruiting, placing, educating/training/retraining, promoting, retaining, terminating) human capital? What procedures/practices does the company have in place or plan under extraordinary/ emergency/ "surge conditions? Are there human capital-related legal/regulatory measures the company would like to see instituted, changed, sustained? Why?*

[3]Austria – Belgium – Canada – China – Denmark – Finland – Germany – Ireland – Japan – Netherlands – New Zealand – Norway – Russia – Singapore – Slovenia – Sweden – Switzerland: *With specific regard to human capital, where does the country rank in the world vis-à-vis other countries? What is the significance of these rankings to the United States, the region, the world? What role (e.g., overriding, central, modest, marginal) does human capital play in determining the country's standing in the world? What particular human capital factors/"metrics" constitute strengths and weaknesses for the country? To what extent do the strengths constitute advantages, and the weaknesses disadvantages, vis-à-vis other countries? To what extent is the country a global leader (or follower) in human capital? What is the significance of this? What does the country's human capital condition/performance suggest in terms of policies/programs/initiatives other countries should adopt vis-à-vis the country?*

The first portion of this report addresses, in order, different facets of SHC related to national security capabilities; resource scarcities in light of abundant global challenges; innovation and the innovation policy environment; business relations and the business environment; and mobilization. The second

portion of the report offers more focused perspectives on SHC, covering assessments of specific industry studies, private firms, and countries.

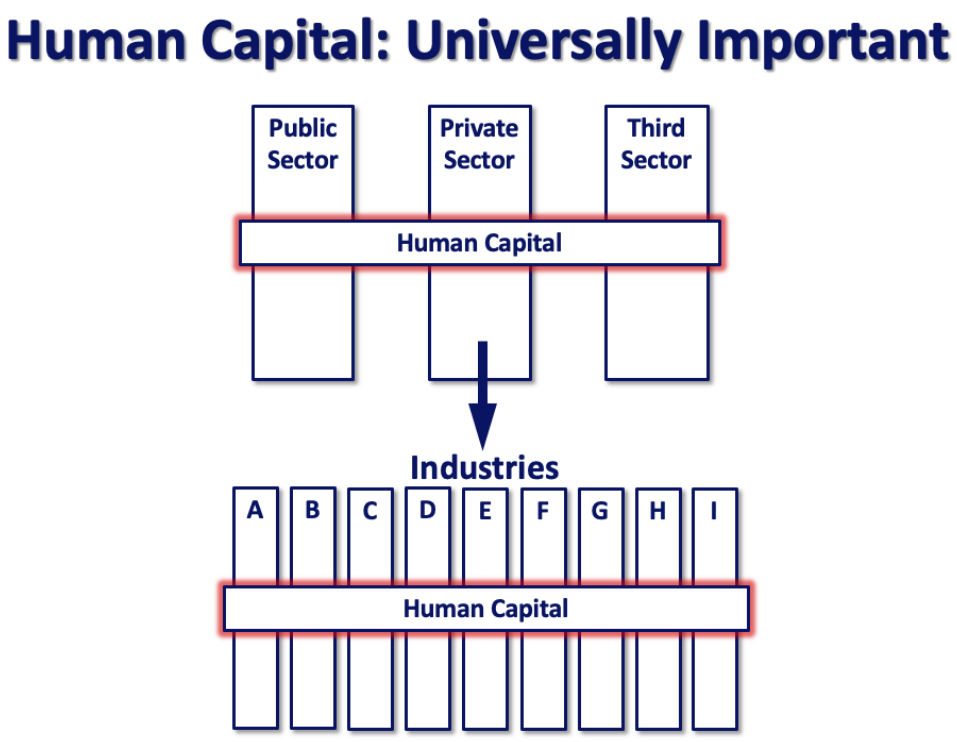
Human Capabilities for National Security

President Donald Trump's 2017 National Security Strategy highlights four pillars considered vital to U.S. national security: (1) protecting the American people, homeland, and way of life; (2) promoting American prosperity domestically and abroad; (3) preserving peace through strength; and (4) advancing American interests.[5] Human capital – individual and collective, public and private, national and international, under routine and emergency conditions – is foundational to each of these strategic pillars. Thus the importance of thinking in terms of **Strategic** Human Capital.

As a case in point, Robert Goldenkoff of the U.S. Government Accountability Office has highlighted that in all eight of the GAO federal government "high-risk reports" issued since 2001, human capital has underpinned 34 high-risk areas and agencies (e.g., the U.S. Department of Veterans Affairs' challenges with regarding personnel burnout, leadership disconnects, and patient neglect).[6] SHC has repeatedly shown itself to be central to the performance and concerns of all governmental – and, for that matter non-governmental – organizations. The problems agencies face almost invariably have a root cause involving or associated with human capital.

To be sure, SHC extends well beyond the confines of government. Figure 3 highlights the universal importance of human capital as it amalgamates the different sectors and industries that contribute to, affect, and are affected by national security.

Figure 3. Ubiquity and Universality of Human Capital



Concerning the SHC cross-linkages depicted in Figure 3, Devin O'Connor of the Committee for Economic Development asserts that developing SHC is critical to national interests and that buy-in from government, employers, and employees alike is essential.[7] The SHC cross-linkages ramify across

government, civilian, and commercial entities, and diffuse throughout individual industries as well. In particular, CED argues the case for understanding how underutilized talent sources can be cultivated and supported for the sake of bridging gaps in certain sectors.

CED research on SHC-based issues mirrors that elsewhere in identifying a number of developments of particular concern: e.g., the decreasing growth of the U.S. population, an aging labor force, and relatively slow productivity growth over the last 15 years.[8] These factors ultimately will require the United States to enact policies that maximize the entire population's potential. Specific policy areas the United States can and should address to better empower underutilized talent sources include ensuring affordable housing for the populace, investing in early childhood initiatives beyond Head Start, and improving college completion rates for students from low-income families.[9] Through such approaches, gaps in workforce capacity may be shored up and thereby more readily support the country's strategic aims.

Roland Edwards, Deputy Chief Human Capital Officer for the U.S. Department of Homeland Security, offers a constellation of priorities that highlight the universal, ubiquitous nature of human capital (alluded to above) and that, taken together, would provide workforce capabilities that support national security, while also dealing with scarcities of resources (discussed below). The five DHS human capital priorities include: (1) a Human Resource Academy, a resource center that works with organizational leadership to assist in sourcing, hiring, and placing qualified human resources; (2) Human Resources Information Technology, which focuses specifically on tracking employee processing, performance, and well-being over the course of the employee's career with the organization; (3) an individual whole-person approach that focuses on both employee readiness and resilience to enhance performance and productivity; (4) a Cybersecurity Talent Management System that assists in matching skills, abilities, and expertise obtained outside the federal system to federal position requirements for recruitment, pay scalability, and pay grade; and (5) Inclusive Diversity to comprehensively identify and integrate diverse employee job skills, experiences, and insights from various walks of life rather than focusing simply on race- and gender-based diversity.[10]

Scarcity of Resources and Abundance of Challenges: SHC Considerations

Although the CED concerns and initiatives alluded to above are germane to America's strategic aims and associated security interests, achieving those ends entails considerable competition across the various dimensions of SHC for the scarce resource of talented people. Ambassador Ken Merten, Deputy Chief Human Capital Officer for the Department of State, and Bob Leavitt, Human Capital Officer for the U.S. Agency for International Development, caution that the old adage "people are our most important asset" is simplistic and misleading.[11] Given the rapidity with which organizational priorities and strategic imperatives change, a more appropriate imperative would be to insist on the "right people for the right job."[12] Unfortunately the "right people for the right job" are scarce and thereby pose a serious SHC challenge.

To better corral scarce resources and structure SHC efforts in support of national security, Dr. Allen Zeman of the Center for Human Capital Innovation points to the ways the World Bank prioritizes SHC concerns: (1) education, or how we allocate the quality of education across the country (e.g., parental income, which has tended to be the basis for education allocations, may not necessarily be useful); (2) property rights and enforcement of implicit contracts (i.e., "If I invest, I obtain"); (3) championing freedom to open doors and improve quality of life (e.g., the Freedom Index in the United States isn't the highest worldwide, yet it is important for strategic progress and individual well-being); (4) improvements in healthcare affordability, capacity, and capability; and (5) enhanced agility (and ability) of government (e.g., responsiveness to and reserves for contingencies, sustained ability to provide for people's concerns, fostering technological advances).[13]

Denoting SHC as arguably this country's most under-unappreciated commodity, Zeman asks, "What is the gap between the ability of our nation versus the achievement of our nation?"[14] That is, from a SHC perspective there is inestimable untapped potential to address national and global challenges, yet paradoxically such SHC resources remain scarce. Until the government and private sector alike view our national and global problems through the SHC lens, we won't be able to elevate and solidify our economic standing.[15] Government should make a national investment in creating a workforce the private sector can use; this would enable the private sector to better contribute to truly national priorities and well-being.[16] The lack of subsidies to support trade and craft schools remains a significant contributor to differences in gross domestic product and potential economic growth. Yet another gap between current status and future potential is the opportunity cost (e.g., deferred or lost income) citizens face when considering whether or not to attend trade school.[17] Through such suggested initiatives, as well as engagements with strategically-oriented organizations such as the Business Roundtable, perhaps a greater impetus will emerge to invest in the near-term to build a workforce that can better meet America's long-term needs.

The Business Roundtable, a forum in which chief executive officers of Fortune 250 companies meet to discuss corporate, national, and global workforce issues, has identified the need for workforce hiring practices to shift from task-based assessments to a more skills-oriented focus.[18] Longstanding hiring practices of fixating on prospective employees' educational credentials to the exclusion of their skills only propagate and perpetuate the talent vacuum.[19] Firms and potential employees alike seem to evince increased understanding of this, based on projections suggesting that upwards of 30% of U.S. institutions of higher education will close within the next decade or two.[20]

Although formal university degree programs can provide a framework from which skills and talent can grow, Matthew Brink, assistant executive director for the National Association of Colleges and Employers, points out that several factors (in addition to the workforce focus on skills taking precedence over academic degrees) are creating existential pressures for colleges and universities. Anticipated closures will be secondary to students' financial constraints, ongoing population reductions, and student concerns about the opportunity costs of investing in traditional college education in lieu of directly entering the workforce.[21]

Carolyn Lee, executive director of The Manufacturing Institute and workforce partner of the National Association of Manufacturers (NAM), reaffirms these other observations that the "critical factor in manufacturing is skill level as opposed to education level; we need to value skills and be able to measure those skills."[22] One important way to achieve these ends is through internships, which "have value and need to be embraced as a pathway to success in a career."[23]

SHC concerns are especially salient to the viability of the manufacturing sector. NAM, the largest trade organization supporting U.S. economic interests and addressing manufacturing human capital matters in industry, notes that the top three human capital challenges in the manufacturing sector are: (1) attracting and retaining a quality workforce, (2) trade uncertainties, and (3) rising health care and insurance costs.[24] As a recurrent theme, these factors are interconnected to one another and to SHC more generally. Just as government can shape workforce status, the manufacturing sector in turn can shape the national security and trade landscape for government and the public at large.

With numerous state and non-state actors competing with one another around the globe, the intelligence community (IC) is also a significant stakeholder in overcoming SHC scarcities to meet emerging international challenges and challengers. Sherry Van Sloun, Assistant Director of National Intelligence for Human Capital, underscores the importance of IC initiatives to recruit and retain talent, given the significant competition for critical IC professionals – namely those with STEM backgrounds and exposure to both the private and public sectors.[25] The IC's Right, Trusted, Agile Workforce initiative

is noteworthy in this regard. Under this initiative, the IC has reassessed its classification procedures to see if security clearances can be completed outside Washington, D.C., worked with military and national security contractors to identify secure work facilities across the country, and proactively taken IC recruitment efforts to smaller cities such as Charlotte, North Carolina, and Austin, Texas.[26] This forward-leaning approach has paved the way for overcoming recruiting problems (e.g., security clearances taking more than a year to complete, prompting candidates to seek employment elsewhere.

The IC Officer for Life initiative also warrants mention. This initiative seeks to continually invest in and create advantages for current IC employees, empowering them with opportunities in formal education and unique training programs over the course intelligence officers' careers.[27] Moreover, the Officer for Life initiative allows IC employees to maintain and even re-tool their skills to accommodate the increasingly complex, ambiguous working environments they face.

The One IC Workforce initiative is a noteworthy exemplar for integrated recruiting and the promotion of the sprawling 17-agency IC as a single enterprise.[28] The objective is to decrease competition for talent and facilitate getting "best-fit" employees into each IC position, regardless of the parent agency. Further, in order to more successfully recruit young employees, the IC has expanded social media use and data tools to conduct targeted recruiting; has created partnerships with the private sector to provide growth opportunities; and is reaching out proactively to junior college students. Finally, the Trusted Workforce 2.0 program is a government initiative expressly designed to expedite security clearance processes through automation and continuous evaluation.[29]

Integral to SHC initiatives, independent of sector, is the cultural precedent set by such initiatives. When different sectors – and the industries within them – embrace initiatives such as those advanced by the IC above, these measures end up becoming integral parts of various organizational cultures.[30] These organizations, by so doing, invest in and then capitalize on the wealth inherent in the peoples of the nation and the world, public and private. Transcendent of traditional (antiquated) human resources approaches, SHC serves to build national and international human capacity.

Indeed, distinctions should be made in developing a larger pool of talented personnel. Officials of the Association for Talent Development (ATD) point out the need to differentiate talent and human capital from human resources (HR). Whereas HR includes the transactional parts of the employee experience – including recruitment and onboarding – talent development focuses on employee development, training, and the mitigation of skills gaps.[31] ATD exemplifies an organization dedicated to researching SHC issues to better benchmark employee training, develop employee skills throughout a person's with a given organization, and thereby cultivate a richer talent base. ATD's annual state of the industry report scales firm spending on talent development (e.g., training programs) on a per capita basis, by firm size and specific industry groups.[32] ATD's annual capability model assists talent development professionals in performing their duties and elucidates metrics of the highest importance to those concerned with true talent development: employee communication skills, lifelong learning pursuits, and employee abilities to gain stakeholder consensus.[33]

Beyond training and recruitment, what are some factors that can have an especially pronounced impact on SHC across organizations and nations? John Forsythe, managing director of Federal Organizational Transformation at Deloitte Consulting, points out that future leaders in the human capital domain may have a proclivity to advance their careers and get promoted by staying low-key and not taking calculated risks.[34] However, personal promotion and career advancement aside, the long-term vitality and robustness of SHC – for organizations and nations alike – lies in risk intelligence, precisely the approach needed for the pursuit and achievement of national security, broadly conceived.[35] In fact, two critical skills in particular seem of utmost importance for future strategic leaders: (1) the ability to manage technology; and (2) the willingness of leaders to be fully accessible. Beyond required knowledge, skills, abilities, and

competencies, the competitive constraints of today and tomorrow will require a shift from customer and mission focus to talent focus (somewhat counter to longstanding tradition, especially in the military, to accord mission accomplishment priority over all else).[36] The top human capital trends, according to Deloitte are: learning in the flow of life, correlating employee experience and human experience, and talent mobility.[37]

Among the most competitive constraints to be considered as we move into the future are cultural and generational shifts over time. As Matthew Brink (National Association of Colleges and Employers) observes, "Currently, there are four generations in the workforce with a fifth *en route*: Baby Boomers, Generation X, Millennials, Generation Z, and Generation Alpha. It is essential to understand the tendencies and expectations of each generation. Generational influences can have a material impact on the perceptions and expectations of workers, co-workers, and supervisors – especially in terms of work-life balances."[38]

"Whole-of-Nation" and Firm Collaboration

In terms of SHC, government and firms may be said to have a co-dependent, bi-directional collaborative relationship, whether intentional or not; each tends to serve the other and, where they act together in sync, they contribute to national security and enhance the overall national interest. The Business Roundtable offers examples of how corporate-level solutions can provide a framework for nationwide adoption by firms and government alike: e.g., its Workforce Partnership, Credential Engine, and Skills First initiatives.[39] BRT is also moving ahead aggressively with policy reform efforts, two of which are (a) a minimum wage increase to mitigate poverty and (b) increasing the number of Pell Grant offerings to serve those who are hesitant about seeking higher education because of lack of finances.[40]

To facilitate government-firm collaboration by integrating existing programs with new programs, David Langdon of the American Workforce Policy Advisory Board (AWPAB) notes that the AWPAB under the President's executive order has established the National Council for the American Worker.[41] The Council acts on and seeks to carry out the President's call for a National Workforce Strategy focused on (a) multiple pathways to employment, (b) corporate concentration on skills-based hiring, and (c) employers investing in work-based training. To convey the importance of AWPAB, the Council employs three committees: one for branding (run by Apple's CEO and IBM's chairperson), one for data recording (run by the Governor of Indiana and the CEO of SAP), and one for candidate recruiting and training. Employers can take advantage of the end information for hiring decisions, while higher education can use such information to inform placement criteria and selections. The principal industries of focus for data recording are cyber, retail, and nursing/healthcare. In sum, AWPAB efforts are tied to the President's agenda for increasing gross domestic product by heightening employee productivity.[42]

Another area of discussion for the Worker Council is the Future Workforce itself. This line of effort focuses on determining what skills will be most fully required fully to support a future defined in large by artificial intelligence (AI) and automation advances.[43] The Council has actively engaged industry in an effort to better understand AI and automation developments, requirements, and impacts. Such efforts highlight the importance of presidential direction and action for improving how government, firms, and the nation as a whole can come together to foster improved SHC.[44] Improved SHC approaches unquestionably promise to benefit individuals, their communities, the nation as a whole, and even the international community globally – all, directly or indirectly in the service of national security and the national interest.

In seeking ways to identify and ameliorate gaps in public-private sector collaboration, Michael Wolf of the U.S. Bureau of Labor Statistics (BLS) notes the relevance of SHC across 800 occupations and 300 industries addressed annually in the BLS Occupational Outlook Handbook. One key development, widely recognized, is the aging population, which "has a tremendous impact on occupations and industry

because the services an older population consumes are much different than younger people."[45] BLS findings regarding major U.S. industries highlight the fact that the construction industry though having faced significant downturns during past recessions, is projected, by 2028, to return to 2006 pre-recession levels, with manufacturing jobs expected to decline only slightly during that timeframe.[46] Retail trade, heretofore a growth industry, also is expected to decline slightly due to the growth of e-commerce, which has driven a decreased need for in-store cashiers and others in that industry.[47] Growing, widespread automation is projected to produce further decreases in occupational groups that would otherwise provide hands-on production and administrative support. In contrast, healthcare promises to continue to grow, with six of the 10 fastest growing occupations being related to medical and similar services.[48]

Innovation and the Innovation Policy Environment

The national innovation system, as it relates to SHC, is alive, well, and likely to improve across multiple domains in the years ahead. Andy Van Kleunen, CEO of the National Skills Coalition, a policy organization founded to respond to legislative and executive branch trends regarding workforce training, points to concerns about programs that are foundational to spurring innovation. For example, both Democratic and Republican administrations continue to spend progressively less on the three main federal programs in this area (i.e., the Perkins Act, the Adult Education and Family Literacy Act, and the Workforce Innovation and Opportunity Act).[49] His belief, like that of others in the field, is that the federal government should make more of an investment in training those who won't go to a four-year college and those over the age of 21. Notably, the United States has a surplus of people who possess more formal education than they need for their jobs but lack required skills required for the most demanded jobs.[50] Looking to Germany's national apprenticeship program as a potential model, the National Skills Coalition is at the forefront of organizations advocating the funding of apprenticeship training pathways to fulfill key jobs.[51]

Coupling hands-on, skills-based training such as apprenticeships, Carolyn Lee of NAM notes the importance of balancing traditional education programs (e.g., K-12, university programs) with complementary skills-based training. Traditional programs in science, technology, engineering, and mathematics (STEM) are often viewed as a prerequisite to the higher-level skills and abilities in the manufacturing sector.[52] This approach and associated perspectives on factory life need to change to attract the next-generation workforce. Moreover, both the U.S. government and private corporations need to address how to ensure that educational programs are providing the skills needed by industry; addressing these issues requires enduring partnerships between education and industry.[53]

Jennifer Worth of the American Association of Community Colleges (AACC) emphasizes how community colleges impact SHC and future innovation by being affordable in cost and flexible in schedule to meet the needs of both individuals and communities.[54] "Community colleges," she notes, "use applied learning to reinforce real-world expectations. This method is a fundamental principal practice for the learning model for the American workforce through community colleges." AACC as an organization believes in accentuating how individual experiences can be capitalized on to prepare for work experiences.[55] Committed to educational preparation, hands-on skills development, and sowing the seeds for future innovation, AACC seeks to advance SHC through collaboration with the President's Taskforce on Apprenticeships, the American Workforce Policy Advisory Board, Expanding Community College Apprenticeships, and the American Legion Military Credentialing Advisory Roundtable.[56]

To spur interest in advanced education among those who otherwise may not view academic-to-workforce pursuits as viable or even worthy of appreciable consideration, Michelle Marks of George Mason University's Academic Innovation and New Ventures Program (AINVP) highlights how AINVP helps set high schoolers up for success – which, in turn, translates into a more highly skilled, retainable,

innovation-minded workforce.[57] Recognizing that a continual, robust talent pipeline is critical to keeping U.S. employers competitive, AINVP is setting a new standard on serving an otherwise underserved population; nationwide this amounts to some 44 million adults in the lowest quartile for education and income, six million disengaged youth aged 16 to 24 years (i.e., who are not in school, work, or training), and some 10 million low-income college students from the lower half of household income.[58] All of this must be seen in light of the rising cost of college, the student debt problem, and the high number (85%) of students who may begin community college but fail to transfer or obtain a four-year degree.[59]

In addition to GMU's AINVP, the power of community college collaboration with traditional university programs is what, in military argot, might be called a big "force multiplier"; witness GMU's Advance Program partnership with Northern Virginia Community College (NoVa). A student who begins at NoVa has an established pathway to GMU. This includes immediately receiving a GMU student identification card, being assigned an advisor he or she will keep through graduation, having access to GMU student healthcare, and possessing the promise that every NoVA credit will transfer toward an undergraduate degree.[60] The GMU-NoVa collaboration, increased advocacy for open educational resources (e.g., digital books), and innovations in financial aid could expand benefits to the underserved, benefit the workforces they will join, inspire others to follow in their journey, offer more opportunities for innovation (within industries and perhaps the education system as a whole), and in turn represent a win nationally in SHC terms.[61]

In addition to assisting underserved populations through changes in the educational system and policy, immigration policy reform is another area where talented foreign professionals could be attracted and retained in the interest of bolstering workforce capacity, capability, and innovation. Dane Linn, The Business Roundtable's Vice President for Immigration, Workforce, and Education, stresses the necessity for immigration policy reform to decrease the many non-citizen STEM professionals working under H1N1 visas.[62] Ideally, policy would better facilitate retention of U.S.-trained foreign STEM students in the United States after they complete their training and, likewise, enable properly vetted foreign STEM professionals to come to the United States.

Bridging the gap between educational institutions, the private sector, and government, Jeanne Contardo of Capital CoLab (part of the Greater Washington Partnership) focuses on solving workforce and SHC issues throughout the National Capital Region. Capital CoLab has developed the digital tech credential, a credentialing process for those graduating from participating universities in the region and going into entry-level digital positions. The program has four STEM pathways – cyber security, networking, data management, and software development – and each pathway has a series of subordinate occupations.[63] Employer participants include Amazon, Washington Gas, and MedStar Health. Education participants include the University of Maryland, George Mason Uiversity, and Howard University. In the fall of 2020, the program aims to expand from six to 19 post-secondary partners. Additionally, CoLab is now working with the region's community colleges and K-12 public school districts to develop similar credentialing. In implementing the program, critical skills and abilities are cultivated locally and implemented by each university or community college, enabled along the way by regional business leaders who communicate employee requirements and needs to educators who build curricula.[64]

In the spirit of spurring innovation and putting the right people in the right jobs, DoD Chief Civilian Human Capital Officer Anita Blair and Director of Military Personnel Lernes Hebert point to the crucial role of Congress in creating "a more flexible legislative framework, so the [military] services can more easily respond to emerging work force needs."[65] To this end, DoD needs to harness data analytics to enable human resource professionals to make more informed choices regarding policies to get the right people, in the right jobs, at the right time.[66] This, says Blair, is a holistic challenge, being able to respond to environmental and cultural changes to ensure that the Defense apparatus consistently and reliably has

the necessary talent for its missions An example of an effort to address this challenge is the Work Force Rationalization initiative to create an "optimal" DoD force structure: a more unified, integrated active duty-reserve component-civilian structure that, ideally, would enable personnel to move seamlessly between components (e.g., an individual who is active duty one day, then a reservist the next, then a civilian). This, the argument goes, would keep DoD from losing talent to the private sector.[67]

Beyond DoD, Robert Goldenkoff of GAO proposes that U.S. government agencies at-large need to better share talent resources among themselves.[68] Because agencies tend to be their own worst enemies, they need to focus on three areas to facilitate improved performance and resource sharing: leadership, culture, and practice. Leadership should focus and be focused on holding senior leaders accountable for human capital issues, while fixing culture requires an organizational focus on values, diversity and inclusion, and building relationships.[69] Moreover, to optimize performance and innovation through policy, several measures should be undertaken: cultivating and retaining STEM professionals; improving occupational classification systems, pay systems, and performance management systems; instituting preventive actions to preclude poor performance; and improving hiring strategies.[70]

Business and the Business Environment

Hye Jin Rho of the Center for Economic and Policy Research brings attention to SHC practices that are evolving across different business sectors. A key challenge, she suggests, is that firms are less willing to invest in internal training programs than they used to be.[71] There is an increased need among businesses not only for more STEM-qualified workers, but also for those equipped with "soft skills" (e.g., leadership, communications, and interpersonal abilities and aptitudes). Automation is driving the decline in mid-level management and is also leading to outsourcing that fissures services that previously performed in-house (e.g., human resources, assembly-line work, even janitorial services).[72] The business environment has also seen a boom in the so-called "gig economy." The gig economy presents an interesting SHC conundrum, in that more people are pursuing gig jobs but more than 50% of gig workers are not inclined to do it for the long-term; some gig workers believe it will be a stepping-stone to a permanent job, while others do it because their primary employment does not provide an adequate wage.[73]

Matthew Brink of the National Association of Colleges and Employers, which strives to uncover what higher education students need to transition successfully into business, highlights several issues that demand immediate and continuing attention: the need for continuous learning/re-skilling, STEM, gig employees, employee experiences, and international learning.[74] Higher education's focus on micro-credentialing must shift to more emphasis on "stackable credentials and skills." By 2030, many high-demand current skills will be replaced by automation, while STEM competencies will need to be infused with and complemented by creative interpersonal skills (extremely intelligent and capable engineers, for example, offering limited value if they can't communicate and collaborate).[75]

A sobering note on SHC is offered by Michael Wolf of BLS, who argues, based on BLS projections, that occupations requiring more education for entry will continue to grow faster and their wages will be higher than most other occupations.[76] Businesses will offer higher wages to those who seek occupations requiring an apprenticeship, and there in all likelihood will end up being a "missing middle" (where high-skilled jobs grow while middle-skilled jobs decline).[77]

SHC Assessments

Whereas the preceding discussion has offered general, overarching insights on the Strategic Human Capital landscape, with associated implications for national and economic competitiveness, the following passages offer more specifically focused assessments of selected industries, private firms (that are major government contractors), and other countries (generally recognized for their human capital performance).

Industry Study Assessment 1: Electronic Warfare
Lieutenant Colonel Micaela Brancato, Air National Guard

Background: From early use in the Russo-Japanese War to the World War II "Battle of the Beams" and more recent innovations in attacking, protecting, and supporting control of the electromagnetic spectrum, the Electronic Warfare (EW) industry is feeling the same human capital effects of shortages in STEM skills and cleared talent as other major defense industries. The question is whether the U.S. government will invest in the next wave of EW technology amidst budget constraints, competing priorities, and now the economic downturn caused by a global pandemic. Or, will EW continue to operate in steady state, challenged by (a) a fragile supply chain tied to global competitors like China, and (b) heavy reliance on the expertise of an aging workforce. Examining the EW industry helps senior leaders better understand the future of major weapon systems electronic countermeasures on the ground, at sea, in the air, and in space. Using data from L3Harris and the Air Force Research Laboratory as primary references, the following assessment addresses the EW industry composition, barriers to recruiting and retention, surge capabilities, and policy recommendations for the future of human capital.

Composition: EW is a highly technical, precision-assembly, engineering-heavy industry. It relies on mostly advanced degree-holding personnel, working in classified facilities, in a few geographic hubs along the coasts of the United States. Companies hire large cohorts of electrical engineers, but find it difficult to recruit when EW-specific degree programs don't exist and most of the work is classified. In fact, many EW professionals are hired through mid-career transfers or company internship programs. Only a few female and non-Caucasian engineers exist (despite focused diversity-recruiting efforts); however, more women fill the hourly assembly line positions due to the attention to detail, steady hands, and patience required for tiny component construction in these systems. Most experienced EW personnel are approaching retirement age alongside an influx of brand-new hires. This creates a skills gap and several concerns for the future of EW talent management.

Barriers: The majority of EW defense firms cite time delays for background checks and security clearance adjudications as the primary barrier to hiring and retaining employees. By the time an employee gets cleared to enter a secured facility and learn his/her job (sometimes up to a two-year wait), most talent finds better offers in the commercial sector or in non-classified positions elsewhere. In addition, many qualified personnel aren't willing to relocate to EW employment areas, which are typically in high cost-of-living regions (such as California and New England). One interesting fact potentially correlates to a lower number of female engineers. While attending American graduate programs where four out of five students are foreign nationals, women marrying Chinese or Indian men do not pursue clearance-holding positions due to close contacts with foreign nationals.[78] As with most classified jobs, overcoming the limited information on what EW professionals do, along with a less flexible work environment, produces serious challenges to competing effectively with innovative companies like Amazon or Google. However, the innovative mission of EW is still a selling point that draws personnel driven by idealistic and patriotic motives.

Surge: Since an increased demand would mean going to war with a near-peer, the ability to truly test surge EW human performance capabilities is difficult. The estimated training time is approximately 6-12 months for component production. There are options to increase capacity by going from two to three shifts and relying on personnel from other organizational components within companies to surge. Also, partnerships with other U.S. and foreign companies, government agencies like DARPA and Lincoln Labs, and academe all offer prospective pools of surge talent. For current requirements, many companies feel they are meeting the need. However, the EW industry is competing for a shrinking talent pool with the right technical expertise and the ability to pass background investigations. This problem only increases as the preponderance of expertise approaches retirement age.

Recommendations: Security-clearance reform and extended working visas are probably the top two policy avenues for improving the EW talent pipeline. Finding ways to reduce the background investigation timeline is crucial for timely on-boarding and training of new employees. If there are extended delays in these processes, the chances of losing prospective hires grow exponentially. This arguably damages firms' reputations, and word-of-mouth marketing to attract talent disappears. Initiatives to start clearance paperwork during hiring fairs, assigning security sponsors to walk applicants through the process, and providing proactive updates to employees and supervisors are all current techniques in use by firms in the business. Being proactive and coalescing with like-minded organizations to communicate to Congress such concerns seeks to ensure enhanced EW human capital growth.

The federal government needs to realign its RDT&E investments with the priorities expressed and/or implied in the National Defense Strategy. Currently, there is a mismatch, with arguable overreliance on foreign partners to fill gaps (a prime example being the semiconductor industry). Also, continued emphasis on introducing STEM in earlier education and keeping students interested throughout their academic experience should be part of a national strategic initiative to build the EW bench. Other promising ideas include partnerships like those between firms like L3Harris and Stevens Institute or between the Air Force Research Laboratory and the University of Dayton Research Institute to connect electrical engineering degrees with national security professions. Learning from other best practices can improve interest levels and provide encouragement to prospective EW talent at a younger age. For example, Raytheon is figuring out ways to permit retiring subject-matter experts to work longer in part-time capacities, while Huntington Ingalls VIP tours bring local teachers onsite to see how their skills might translate into local job opportunities.

Summary: As threats to national security change due to technology advancements, more readily available information, and greatly heightened global interconnectivity, the importance of skilled, talented human capital for the EW/EMS industry grows significantly. The United States needs, now more than ever, motivated individuals with the right skills who can think innovatively and strategically to counter adversary jamming and spectrum disruptions. From multi-spectral situational awareness and highly accurate threat warning to sensor fusion and countermeasure capabilities, companies like L3Harris need qualified people, not just advanced artificial intelligence, to save lives, protect equipment, and empower mission success.[79]

Industry Study Assessment 2: Missile Defense
Commander Coleman Chandler, United States Navy

Missile defense is a system of weapons, designed for detection, tracking, interception, and destroying other missile systems.[80] Missile Defense technology includes strategic missiles: designed to target long-range missiles; theater missiles: designed to target medium-range missiles; and tactical missiles: designed to target short-range missiles. The Department of Defense is the primary consumer in the United States to make use of these weapon systems. The purpose of missile defense technology is to counter ballistic missile threats to the homeland of the United States, its allies, and partners.

What specific industry/industries/sectors is your assigned Industry Study focusing on? The Missile Defense Industry Study looked at an array of sectors, but some students specifically looked at the following markets: space launch, space-based sensors, and space-based interceptors.[81]

How important is human capital to your assigned Industry Study's analysis? Human capital is extremely important in the Missile Defense industry. The Missile Defense industry students visited Raytheon, Lockheed, and Aerojet Rocketdyne; and all three companies discussed the challenges in attracting and hiring technically skilled people for their companies. All three companies recruit heavily from engineering-focused universities and work hard at developing programs (e.g., mentoring, college

loan payoffs, etc.) to keep talent. Aerojet Rocketdyne is going through a "Competitive Improvement Program" to consolidate facilities and spoke to the need to understand the merging of different cultures under one company. Each company the students visited talked about merging various defense contractors under one umbrella and the difficulty in understanding different cultures and ensuring the best practices from each company are noted and utilized.

What specific human capital concerns is your assigned Industry Study addressing? Why? The industry study has focused a lot on managing different cultures in cases where companies merge and, in some cases of prime and sub-contractors. Missile Defense is made up of many different companies that need to work together to produce the quality products required by DoD. The students also discussed the low unemployment rate and the need to hire skilled engineers and technicians into specific jobs. Every company is competing for the same skilled workers.

What types of human capital-related policy recommendations, if any, is your assigned Industry Study considering? The Missile Defense Industry Study didn't discuss specific human capital-related policies for this sector. However, looking at the human capital issues affecting today's labor force in the defense market, there might be a need for Congress to modify the authorities of government agencies (e.g., DoD) to overhaul its security clearance policy. By doing so, it would allow veterans transiting from uniformed service to have a grace period to retain their security clearance to improve employability for critical skilled jobs in the private sector.

Private Firm Assessment 1: Science Applications International Corporation (SAIC)
Mr. Jeffrey Beaudoin, Defense Contract Management Agency

Science Applications International Corporation (SAIC) is a global firm with 97% of its $6.5 billion in 2019 revenue coming from defense (60%) and government (37%) contracts.[82] Headquartered in Reston, Virginia, the firm employs approximately 23,000 people working on more than 3,000 contracts across 32 states, Germany, Guam, Bahrain, and Belgium.[83] SAIC is primarily a contract services company focusing on four main business segments: Mission Support, Information Technology, Platforms, and Logistics.[84] To remain successful and competitive in bidding for government contracts, SAIC must depend heavily on the expertise, knowledge, and performance of its employees. In order to meet those ends, SAIC focuses on competing to recruit and retain highly trained and skilled engineer-technical-professional workforce in order to meet contract personnel requirements. As noted in the SAIC 10-K filing, "competition for skilled personnel is intense and competitors aggressively recruit key employees."[85]

SAIC's primary resource is its people; as such, the subject of human capital management is a prominent topic mentioned by the firm's leadership in proclamations to investors. As a service provider in highly competitive defense and federal government markets, SAIC faces challenges and concerns quite similar to many of its competitors in the market. SAIC, and much of its competition, routinely compete for the same highly skilled and qualified talent for the same contracts. Government contracts, especially those for DoD, require contracting firms to provide workforces with security clearances – a requirement that may have up to a two-year lead time and cost as much as $15,000 per Top Secret new-hire employees.[86] Skilled talent in highly specialized areas with security clearances is in great demand for SAIC and its competitors. Time and cost constraints for security clearances add to the employee retention risks SAIC seeks to mitigate through pay and benefits packages, a distinctive organizational culture emphasizing work-life balance, and employee inclusion. Additionally, SAIC also employs acqui-hiring practices through strategic acquisitions in conjunction with recruiting efforts for new talent, thereby competing with peer firms to fill billets on government contracts. Most recently, SAIC acquired Unisys Federal in March of 2020 along with a "portfolio of scalable and repeatable IT Solutions, greater customer access, a commercial–like service delivery model, and expanded relationships with strategic

alliances."[87] The Unisys acquisition comes just 14 months after SAIC acquired Engility Holdings, Inc., achieving the goal of positioning SAIC to compete in Space and IT Modernization, the fasted growing defense and government markets for services contracts.[88]

SAIC's competitive edge is highly dependent on people. The firm's commitment to its workforce begins with the core values expressed by the firm's leadership and made public on the company's homepage:[89]

> ***To Our Fellow Employees, Present and Prospective***
>
> - ***We provide a healthy and safe workplace.***
> - ***We promote an environment that encourages new ideas, high-quality work, and professional achievement.***
> - ***We treat our fellow employees honestly and fairly.***
> - ***We ensure equal opportunity for employment and advancement.***
> - ***We share the rewards of success with those whose honest efforts contribute to that success.***

Beyond company values aimed at and intended to apply to its entire workforce, SAIC's leadership recognizes the importance of sustaining a highly qualified and experienced management team in order to maintain existing business relationships and secure new business.[90]

SAIC places a high value on its workforce, which is evident in what it communicates to past, present, and future employees. The emphasis on workplace culture is publicly touted by the company as a means to highlight diversity, inclusion, and employee outreach into local communities. Digital marketing teams are keen to maintaining the firm's virtual online presence, communicating across popular social media platforms; targeting potential candidates with examples of employees participating in social and community events such as philanthropic endeavors like the Corporate Citizenship Program. Most recently, the Corporate Citizenship Program has expanded to support the firm's military veterans who make up approximately 25% of the total workforce by supporting and participating in programs that include Building Homes for Heroes, Operation Homefront, Wave Warriors Surf Camp – Salt Water Treatment, USO of Metropolitan Washington-Baltimore, and the CyberWarrior Scholarship.[91] Firm recruiting teams work to recruit talent through multiple forms of outreach, including sponsoring Coding Camps, Internship Programs, and outreach to colleges such as George Mason University. SAIC has also organized a defense-specific recruiting team focusing on acquiring experienced military veteran talent by participating in veteran and defense-specific job fairs.

Even with the significant efforts SAIC is making for recruitment, acquisition, and retention of a workforce necessary to continue successfully winning defense and government contracts, there is an employment gap of nearly 14%. According to publicly advertised job opportunities posted on websites such as LinkedIn and Glassdoor, nearly 3,200 jobs are available at SAIC to fill requirements for service contracts around the globe. There are no publicly available data or reporting to answer questions regarding average vacancy length, recruit-to-hire times, or other key metrics. SAIC's Chief Human Resources Officer declined participation in any research that would provide insight into the success of current human capital processes, or how the firm would adjust operations in the event of extraordinary circumstances and respond to emergency or surge requirements on government contracts. Furthermore, the most recent 10-K filing by SAIC repeatedly refers to organizational success being dependent on recruiting and retaining highly trained and skilled staff. With a vacancy rate of 14% under normal operating conditions and sustained competition to recruit and retain qualified personnel, there is a seemingly significant risk that SAIC might not be able to adequately respond to large-scale surge

requirements or emergency staffing increases to meet contract specifications. Finally, SAIC has formed a voluntary political action committee (PAC) overseen by its board of directors, the SAIC Government Affairs Office, and senior company leaders. No details are readily available detailing why the PAC is lobbying political leaders, or what types of legal-regulatory changes it hopes to have instituted.[92]

Private Firm Assessment 2: Huntington Ingalls Industries
Captain David Webber, U.S. Navy

Huntington Ingalls Industries (HII) is the largest military shipbuilding firm in the United States, earning approximately $8.9 billion in revenue annually. With headquarters in Newport News, Virginia, it employs over 42,000 workers world-wide (including 6,800 engineers and designers). At its Newport News Shipbuilding facility, HII constructs, overhauls, repairs and maintains nuclear-powered submarines and aircraft carriers. Similar operations for Navy and Coast Guard surface combatant ships take place at its Ingalls Shipbuilding facility located in Pascagoula, Mississippi.

A Workforce Development Company: Huntington Ingalls' Approach to Human Capital Management. Human capital and workforce development are of central importance to Huntington Ingalls. Indeed, HII describes itself as "a workforce development company," expending more than $110 million each year in "the workforce development pipeline – from early childhood education to post-hire training programs."[93]

Given the volume and specialized skill requirements in the military shipbuilding and repair industries, predictability is the most important human capital factor for HII. Unplanned interruptions in operations are particularly challenging, as occurred during the 2013 federal government sequestration and furloughs. At the time, 3,000 workers were prepared to begin a complex overhaul of a nuclear aircraft carrier at the Newport News Shipbuilding facility. The resultant two-month delay led to the layoff of thousands of employees and the duplicative requirement to rehire, process credentials, and verify security clearances. In addition, only 60-70% of employees returned once shipyard work ultimately began. As a result, HII needed to recruit, screen, and train 1,000 additional workers, leading to increased costs and delays for the company.

As with other firms in the skilled trade and manufacturing industry sectors, HII is faced with an aging workforce. The average employee's age is 42 with many nearing (or at) eligibility for retirement.

In response, HII operates a robust apprenticeship program to ensure a continuing supply of trained craftsmen and craftswomen to meet current and future demands for skilled labor. At its apprentice schools in Newport News and Pascagoula, 1,450 students complete paid four- to eight-year apprenticeship programs blended with job rotations to apply and reinforce their acquired skills immediately. In addition, Huntington Ingalls has formed partnerships with Virginia and Mississippi high schools and community colleges to develop curricula and standards for technical training programs and then offer jobs for program graduates.

As a result of its efforts in pursuit of a "Grow Your Own Approach," HII has filled 42,000 positions since 2011.[94] The firm pursues a "Grow Your Own Approach" in the area of career and talent development, as well. Tellingly, 87% of promotions are drawn internally.

HII has encountered and successfully addressed increased demands for skilled labor in the recent past. In the immediate aftermath of Hurricane Katrina, the Ingalls Shipyard experienced the loss of 1,700 employees (23% of its workforce). This included both recently hired workers who were willing to pursue lucrative opportunities for commercial and residential construction and retirement-eligible master craftsmen dealing with damaged or destroyed homes. HII responded to this hiring challenge by updating and re-scoping work packages to account for having fewer master craftsmen available. It also used instructional videos featuring master craftsmen to develop its newly hired workers. This proven approach

to a surge demand for labor was useful as HII shifted to building two nuclear aircraft carriers nearly simultaneously for the first time ever.

HII believes its underlying human capital must be aligned with overall firm strategy. This involves having the right people to execute known ship construction, overhaul, and maintenance plans. Furthermore, the firm believes that human capital is "the driver of everything"[95] and that the firm's efforts must align with guidance contained in the National Security Strategy, the National Defense Strategy, and strategic documents from the Secretary of the Navy and the Chief of Naval Operations.

Liberating Labor: Recommended Human Capital Regulatory Changes. Many retired HII employees have expressed a desire to continue to work for the firm in a part-time capacity (while receiving pension distributions). This would allow these subject matter experts to continue to train and develop the workforce. However, current federal regulations prevent such employment. As a result, many HII retirees are forced to work for other firms in order to receive funds from their pensions while continuing to work part-time. HII supports changes to federal regulations that would permit part-time employment by its annuitants. Such regulatory changes would benefit both HII and individual HII employees.

Country Assessment 1: Singapore
Lieutenant Colonel Andrew Dausman, U.S. Marine Corps

The Republic of Singapore is an island nation, located between Malaysia and Indonesia in Southeast Asia. Situated near the Strait of Malacca and the South China Sea, Singapore is advantageously located near major maritime trade routes. A former British colony, Singapore maintains a parliamentary system of government (single party) and is one of the wealthiest nations in the world on a per capital basis.

With respect to human capital, Singapore is one of the highest ranked nations in the world for human productivity and development. The World Bank ranks Singapore first of 157 nations based on the World Bank's Human Capital Index (HCI).[96] The HCI "measures the amount of human capital that a child born today can expect to attain by age 18."[97] By comparison, the United States ranked 24th by the HCI, while China is ranked 46th.[98] However, Hong Kong (a similarly developed, high-income Asian nation) may provide a more apt comparison; Hong Kong has an HCI score similar to Singapore; it is ranked 4th in the world.[99]

Another measure of human capital development is the UN Human Development Index (HDI). The HDI measures lifespan, education, and economic standard of living. Similar to its HCI score, Singapore scores above the United States and China, and is ranked near, but below, Hong Kong.[100]

On the HDI, Singapore is ranked 9th in the world and has seen measurable improvements each year over the past 28 years.[101] Although Singapore doesn't stand out in any single component of the HDI, it demonstrates generally strong performance across all index dimensions.

Singapore has arguably benefited from its geographical proximity to major trade routes, coupled with significant infrastructure investment from the United Kingdom during its time as a British colony. However, the country's modern success is due in large part to its human capital. Singapore doesn't possess significant natural resources (outside of its harbors and comparative geographic trade advantage), and its economy is import-dependent. Singapore's ability to maintain a world-leading standard of living is based on successful development of its human resources.

Singapore's strong education system produces a highly-skilled workforce for its service-oriented economy. The benefits of a superior education system are further enhanced by Singapore's free-market economy and transparent, low-corruption system of government.[102] Singapore's economic support systems and the country's approach to education support Singapore's robust development of human capital.

Singapore's excellent healthcare system, and the general health of its citizens, is an area of particular strength. For example, Singaporean children enjoy a near-100% probability of surviving from birth to age 5, and 95% of children will reach age 60.[103] Singapore's healthy population helps the country maximize its human productivity potential. This is certainly a strength vis-à-vis other developed countries and it figures largely in Singapore's high score on the HCI.

A significant weakness for Singapore's human capital development is its checkered history on human rights. In addition to criticism from numerous human rights advocacy groups, the United States Department of State identifies several instances of human rights restrictions in Singapore. Singapore's parliament has been led by a single party since 1959. Additionally, the government imposes "significant restrictions" on freedom of the press, limits public assembly, and carries out warrantless electronic surveillance.[104] Relative to other developed countries, particularly in the West, these practices may be limiting the full potential of Singapore's human capital development.

Singapore is a world leader in education, health, economic dynamism, and per capita national wealth. Moreover, the country tracks with its peers in measures of political stability and legal protections for private property. However, Singapore lags some developed nations in measures of political freedom and human rights. The key issue here revolves around benchmarking. Should Singapore be compared to its geographical neighbors? If so, Singapore appears to be a prosperous country with a political system that affords more political freedoms than authoritarian China or even the semi-autonomous region of Hong Kong. However, when compared to Western nations with similar levels of human capital development, Singapore's somewhat repressive legal system may be a drawback.

Singapore can be viewed as a model for authoritarian nations seeking to develop a free-market economy without a fully liberalizing internal political systems. Conversely, Singapore's success in managing its national healthcare and educational systems may provide an example for Western nations who are willing to adopt a more centralized approach to human capital development.

Singapore is a unique country: one of the wealthiest countries in the world, with a thriving economy, a highly educated population, and an authoritarian government. Arguably, Singapore is the most prosperous independent country without a Western-style, liberal democracy. Singapore's ability to harness the productivity of its citizenry without extending comprehensive civil rights provides an interesting counterpoint to the approach taken by similarly developed countries in the West.

Country Assessment 2: Austria
Lieutenant Colonel James Reed, U.S. Army

Austria and the United States are substantially different in terms of their respective physical size, population, and economic size. Austria's small size carries with it many advantages, and Austria's long-term strategic human capital investments play a central role in determining the country's standing both within Europe and internationally. According to the World Bank's most recent Human Capital Index (HCI), which quantifies the contribution of health and education to the productivity of the next generation of the workforce, Austria ranks 12th in the world.[105] Austria's HCI ranking places it well ahead of the United States, ranked 24th.[106]

Austria's ranking is largely attributed to the Austrian government's investments in education in terms of schooling assessments and expenditures as a percentage of gross domestic product. In 2018, Austria ranked 9th in the world in terms of overall education, while the United States ranked 21st.[107] Concerning early education, which is a key element of a country's strategic human capital, Austria ranks 26th in the world in terms of primary and secondary education; by comparison, the United States ranks 47th.[108]

The major strength of Austria's education system lies in its tertiary/higher learning education investments, the best in the European region and 2nd in the world overall according to the 2018 Global

Innovation Index; the United States ranks 88th.[109] Austria's tertiary education features a large percentage of tertiary enrollment and graduates in science, manufacturing, engineering, and construction. Austria was ranks 10th in the world for the number of students studying abroad as opposed to the United States, which ranks 43rd.[110] As a small country, Austria has a relatively small number of higher learning institutions, with 22 public universities (to include research universities and universities of arts), 21 universities of applied sciences, and 13 private universities.[111] In this regard, the United States continues to hold the number one global university ranking, as opposed to Austria, ranked 28th.

The Human Capital Index also points to Austria's well-established vocational training system and a high skill diversity in graduates. Vocational education and training in Austria is based on a dual system that guarantees apprenticeship training along with a distinctive venue: a company and a vocational school for apprentices, with major emphasis on company-based practical training.[112] This robust system provides an advantage to Austria regionally as a highly developed industrialized country with an important service sector, particularly in the tourism industry that Austria is known for both regionally and internationally.

Austria's human capital needs are defined by an economy where industrial and commercial sectors are characterized by a high proportion of medium-sized companies. According to the Austrian Embassy in Washington, D.C., Austria's most important industries are food and luxury commodities, tourism, chemicals, mechanical engineering, steel construction, and vehicle manufacturing.[113] As one of the most prosperous and stable European Union (EU) member states, Austria's human capital investments appear to be a national priority in guaranteeing Austria's high standing among EU member states and globally.

To remain competitive among EU states, Austria plays to its greatest human capital strength of tertiary education investments that span workforce needs across the spectrum of industries from basic goods and services to technical and labor-intensive production. The school life expectancy of any country's population is a significant predictor of the success or failure of a country's strategic human capital strategy. With an average of 13.9 "expected years of school" according to Human Capital Index, Austria is set apart as an exclusive EU and global leader in the consistent application of vocational, technical, and university educational opportunities vis-à-vis national-level investments and programs.[114]

Social protection systems in Austria form an important fabric for the country's human capital culture and are executed through a comprehensive system of social security and state welfare policies. A key part of the country's social protections exists in its healthcare policies. In Austria, health insurance coverage exists for all employees, their family members, and most recipients of social benefits. Ninety-nine percent Austria's population are currently covered by social health insurance protections.[115]

Entitlements through employers constitute another important element of social and human capital policy in Austria, which includes financial support during illness and pregnancy, special provisions for working parents (i.e., paid care leave), layoff protections, periods of notice, and rules on working hours and rest periods.[116] Several of Austria's social protections target often overlooked work-life balance issues. More countries, including the United States, should consider addressing similar quality of life policies that could be applied to reinvigorate traditional societal values that have eroded over decades of rapid 21st century technological changes.

Regarding human capital in digital and technological innovation, Austria finds itself at a disadvantage vis-à-vis larger countries whose economies and research institutions are better aligned to keep pace and relevance with the unforgiving 21st-century global competition for innovation. On a national level, Austria has 12 digital innovation hubs, of which only five are operational and seven are in preparation.[117] These hubs are intended to cover all of Austria's market domains (i.e., agriculture, manufacturing, health, materials, energy, defense, etc.), leaving the country with significant vulnerability in terms of dependence on external human capital for digital innovations that will likely define Austria's future market practices.

Conclusions (What Is) and Recommendations (What Needs to Be)

The country that brings Strategic Human Capital to bear most seriously, systematically, and coherently in ways that support and sustain recognized strategic aims and priorities will have enduring competitive advantages – in public and private sector performance, cross-sectoral technology and innovation, education-to-workforce effectiveness, and mobilization capacity. Four overarching themes have emerged over the course of this five-month study. First, human capital requirements and shortfalls need to be more clearly identified and diagnosed if they are to be fixed. Second, artificial intelligence, automation, and education (for both STEM and trade skills) are *the* most pronounced SHC imperatives for the present and future. Third, SHC is inextricably and integrally tied to national security, not a distinctive arena of concern that can be dealt with in isolation. Fourth, the health and vibrancy of the Strategic Human Capital enterprise require that human resource-workforce development-talent management policies, programs, priorities, and partnerships all need to be constantly and consistently addressed in the most serious terms.

Considering the central importance of SHC across all organizations and institutions – public and private, national and international, under both routine and emergency conditions – it seems only too clear that the United States needs to guide and be guided by a comprehensive National Human Capital Strategy (NHCS). Five primary lines of effort, undergirded by serious, attentive, sustained congressional oversight, are called for.

First, the NHCS must address and deal with the middle-skills gap (affecting those having difficulty transitioning from high school to relevant programs leading to employment) by modernizing vocational educational systems at all levels. Coordinated effort involving congressional education and labor committees; the U.S. Departments of Education, Labor, and Commerce; civilian universities, community colleges, secondary school systems, laboratories, and think tanks; and private-sector firms, trade associations, and labor organizations will be essential for such a mammoth and significant undertaking.

Second, policies must be instituted that increase the number, effectiveness, and sociocultural awareness of counselors in K-12 school systems, where youngsters may be oblivious to the educational options potentially available to them and may not have the mentoring they need to encourage and guide them. Counselors can bridge these gaps and inspire otherwise under-represented segments of the population to better acquire the knowledge, skills, and aptitudes demanded by the labor market.

Third, U.S. educational programs at all levels must set about to more seriously inculcate students with a sense of the practical, powerful, exciting applications and potentials of STEM. America must address its pronounced STEM deficiencies so the country can more readily adapt to rapidly emerging technological advances and sustain its technological competitive advantages. The time is now to greatly expand and underwrite the desirability, legitimacy, and prestige of apprenticeships and trade skills (especially those focused on automation and artificial intelligence).

Fourth, precisely because private corporations are important national security assets, there must be a greatly expanded commitment to public-private partnerships across the entire array of commercial and industrial sectors. These partnerships must focus on a national talent and skills development program and workforce productivity. Talent should be shared through rotational government-private industry assignments to better keep pace with technological advances. Moreover, to improve the nation's response to emergency situations, having a dual-access government-corporate talent tracking program (e.g., like the U.S. Department of Homeland Security's Cybersecurity Talent Management Program) would greatly increase the prospects of ensuring that more of the right people get into the right jobs and occupations faster to address the emergency challenges.

Fifth, immigration policies absolutely must be reformed by improving visa rules and citizenship opportunities for high-skilled STEM positions, harnessing the power of international collaborative partnerships, and stemming the loss of talented U.S.-trained foreign students back to their home countries.

Doctrinally, ideologically, and philosophically, there is a need for a serious re-look at this country's established strategic guidance documents. If it can be said that human capital underpins all facets of national security, national competitiveness, and international advantage, as well as individual and collective health, well-being, and prosperity, then perhaps it can be said that a National Human Capital Strategy provides the most illuminating and powerful source of strategic direction for the United States in the years ahead.

Appendix A: Mobilization

Human capital recognizably plays an integral role in mobilization – the activation, assembly, acceleration, transfer, conversion, or expansion of resources, capabilities, or assets from one use to another; the conversion of the potential or putative power characteristic of routine conditions to the manifest or "kinetic" power called for in emergency circumstances – whether it be civil assets converted to military uses or military assets converted to civil uses. The same can be said for human capital's integral role in demobilization. Effective mobilization (and demobilization) requires experienced, skilled (in both "hard" and "soft" skills), knowledgeable, competent, committed, and readily available human resources to effectively fulfill mission requirements and achieve strategic aims and priorities. It is in this light that the following interviews, conducted by Strategic Human Capital Industry Study participants with U.S. and international governmental organizations having enduring mobilization missions, offer particularly useful insights into SHC concerns associated with mobilization.

United Nations Development Program (Crisis Bureau)
Mr. Kevin Sturr, U.S. Agency for International Development

Interviewee: Janthomas Hiemstra

What human resource demands and concerns face UNDP's Crisis Bureau under both routine and emergency conditions? UNDP, an agency of the UN, is known for its global network – it has a presence in 170 countries around the world and actively engages with governments. Its core resources, made up of contributions from UN member states (the US was the #1 core contributor in 2018, #4 in 2019) allows the UNDP to respond to emergency and non-emergency needs in the countries where it works. There are both permanent in-country UNDP staff, who manage more long-term development activities such as election support and parliamentary strengthening, as well as more short-term surge responders to crisis situations. A crisis response toolbox has been put together in order to undertake fast deployment of first responders and planning teams for recovery, post-disaster and post-conflict needs assessments. Management is centralized through UNDP's Crisis Response Unit to ensure effective coordination, a strong "whole-of-UNDP" approach and engagement with humanitarian actors.

UNDP Crisis Bureau's approach to international crisis response includes fast deployment of first responders and planning teams, post-disaster, as well as fast-track procedures for procurement and operational support. Would you explain how that is actually done? It is a complicated process, but one important component of the process is the consultant roster we maintain of pre-cleared consultants and specialists with a variety of skills. We have close to 5,000 individuals on that roster who are pre-cleared, so we are usually able to respond quickly. Though we have core funding, in the face of an emergency or crisis (e.g., response to an earthquake, flood, drought, or pandemic), we also seek additional pledges to enable us to meet attendant unforeseen costs.

Regarding UNDP's mobilization of particular human resource capabilities to carry out crisis response activities, are specific skills, know-how, expertise, and experience important, or is the emphasis on raw numbers only? The express roster identifies consultants by 26 different profiles, ranging from communications to disaster response to resource mobilization to famine early warning, for example. So, planning typically focuses on specific skills, know-how, expertise, and experience, even beyond the foregoing technical skills. We also can further identify consultants with regard to such factors as linguistic abilities, geographic experience, and the like.

How typical is it to be confronted by unexpected emergencies, and what are the challenges and difficulties associated with generating human resources to deal with such circumstances? The COVID-19 pandemic crisis is an example of a crisis that was unexpected; unfortunately, it is not unusual

in any given year to be faced by unexpected crises, although the magnitude of COVID-19 is clearly unprecedented.

What constraints (political, economic, legal, technological, sociocultural) affect and even dictate how the UNDP Crisis Bureau and UNDP country offices approach human resource management? As with any international organization, human resource management decisions are affected by socio-economic, political and other considerations. We strive to recruit a workforce that "looks like the world"; we must ensure that our staff is not only competent, but that they have the cultural and political sensitivity to conduct themselves appropriately around the world.

Federal Emergency Management Agency (FEMA)
Ms. Angela Noyes, U.S. Department of Homeland Security

Interviewee: Alex Amparo, FEMA Federal Disaster Recovery Coordinator

Alex Amparo is the Federal Disaster Recovery Coordinator for Puerto Rico and the U.S. Virgin Islands for the Federal Emergency Management Agency (FEMA). In this role, he coordinates response and recovery missions for such disasters as Hurricanes Irma and Maria in September 2017, earthquakes in December 2019 and January 2020, and the present coronavirus crisis. FEMA has a focused mission – "Helping people before, during, and after disasters" – and its work is driven by crises, with the agency covering an average of 100 major disaster events each year.

According to Mr. Amparo, the FEMA mission is fulfilling and can be helpful for recruiting. Creating interest through an attractive mission, however, is only one part of acquiring the workforce the agency needs. FEMA needs to purposefully envision its ideal workforce in terms of quantity and skills, and more aggressively train or find the right people to match requirements. For example, when Mr. Amparo came to his current job, he realized that FEMA needed more project managers and grant-management personnel in Puerto Rico. To meet this need, he hired professionals to educate and upskill people from his existing workforce. Finding and recruiting new talent is also essential. Since 9/11, the pool of potential candidates has increased across the country by virtue of a cadre of graduates coming out of new university programs in emergency management. FEMA needs to identify these individuals and recruit to targets, a goal of the current FEMA director. To bring the force to the right levels of people and skills, FEMA needs to advocate for a multi-billion-dollar capital investment.

Every emergency gives FEMA opportunities to learn. The current coronavirus crisis, for example, is a unique laboratory for deploying remotely. To allow for social distancing, the agency revised its policy, and now 98 percent of the staff is working remotely. FEMA teams struggled at first, wondering how to effectively use Skype or Zoom platforms to "talk across the table" to individuals with different backgrounds. FEMA quickly adapted to the new conditions, however, and has found that over-communicating among employees and with stakeholders is part of the key to success. After this experience, FEMA expects to use more telework even after social distancing is no longer an issue. Pressure to succeed in the emergency environment creates a culture and mentality among the workforce to "get it done." Adrenaline and stress levels are very high, and employees witness suffering, death, and upsetting events. The agency builds in processes to deal effectively with this stress to prevent people from burning out and making mistakes in judgment. One example is mandated rest periods. Every 14 days, deployed employees must take off, and every 45 days, they are allowed to return on a break to see their families. The agency also invests to help ensure the workforce has adequate professional support and resources, including mental health counselors, safety officers, and therapists, as well as training in stress relief, conflict management, and dispute resolution.

To improve retention, FEMA is looking closely at how it develops the workforce. The agency trains new hires in basic emergency response so that every FEMA employee is an emergency worker. After this

baseline training, the agency allows more opportunities to specialize and is laying out clear guidance on career paths and promotional opportunities. FEMA identifies promising employees and exposes them to different areas in the agency and clarifies specific experiences needed for promotion.

For long-term improvement, FEMA is seeking a change in its reservist force, which is now one half of the entire FEMA force. Unless they are deployed, reservists are currently unpaid and do not train. Many reservists are retirees and so can activate without leaving jobs. Under such policies, FEMA can't easily attract younger reservists because this group can't afford to be absent from – and likely lose – their jobs if deployed. FEMA is interested in policy changes that would establish a FEMA version of the National Guard: reservists would have monthly paid drills, enhancing the readiness of the force, and their permanent jobs would also be guaranteed if they were deployed. A standby Reservist force would support recruitment and retention and would help FEMA appeal to younger, more diverse, and multi-skilled people.

NORTHCOM Interview
Colonel Russell Klauman, U.S. Army

Interviewee: Mr. Michael Barnard, Deputy Director, Manpower/Personnel (J-1)

Significant Points:

- Current laws and governmental hiring procedures inhibit the speed of change. While the command has authority to directly hire STEM specialists and some budget analysis-specific positions, many other specialties are not delegated to the command. The on-boarding process typically takes about 60 days. This 60-day period for on-boarding is unacceptable when recruiting and attempting to hire high-demand, low-density fields like cyber specialists, who are also recruited by businesses like Google or Amazon that can complete hiring actions within a few days. This delay in finalizing hiring actions for the government makes competition for talent with commercial business challenging at best.
- Position vacancies inhibit unit readiness. Much like the issue explained above, the speed of hiring actions negatively impacts readiness, as well as possible surge or mobilization situations.
- Security clearance determinations impact hiring actions and effective manpower utilization. Most personnel requiring initial security clearances take about a year or more to receive a clearance determination. Much like the delay in hiring actions, this inhibits the recruitment and hiring of talent from outside governmental agencies. To mitigate this risk, the command recruits heavily from the recently retired or separated service-member population or from other governmental agencies. When recruiting from within government agencies to fill required positions, this doesn't diversify the workforce and bring in new talent with cutting edge knowledge and skills.
- Training development vs. talent recruitment. The most interesting dynamic facing the command is a concern for parts of its workforce either aging out or becoming irrelevant with advancements in technology. Part of this corresponds with the issues stated above. If an organization is consistently short on manpower capacity, it is very difficult to assume more risk by taking time for the current workforce to conduct training to either update skills or develop skills in support of future succession opportunities. However, if the command isn't willing or able to train internally to remain relevant with updated technologies, then the only other way to bring updated knowledge and skills into the organization is by recruiting new talent. This brings the organization back to the challenge with recruiting new talent especially in the high-demand, low-density specialties, because of prolonged on-boarding and clearance determination processes.
- This whole range of issues, viewed in their totality, puts the command in a difficult state of human resource management affairs. Current laws and regulations governing security clearances and on-

boarding prohibit the recruitment of new talent with relevant knowledge and skills; at the same time, constant manpower shortages prevent the leadership of the command from instituting effective training development programs to keep the current workforce relevant and competitive for advancement.

Centers for Disease Control and Prevention
Lieutenant Colonel Micaela Brancato, U.S. Air Force

Interviewee: Ms. Rachel Holloway, Public Health Advisor

Background/Introduction. Rachel Holloway, as a CDC public health advisor, focuses more on disease surveillance, research, and process improvement as the Operations Team lead for the Influenza Coordination Unit headquartered in Atlanta. She was influential in updating the preparedness and response framework for influenza pandemics under the George W. Bush administration (government heavily funded this planning in 2004/5). During this time, she created the influenza risk assessment tool and pandemic severity assessment framework. Throughout her CDC career, she has recommended and implemented policy and procedural changes to achieve greater program efficiencies. She learned a great deal working on the H1N1, H7N9 (Bird Flu), Ebola, and Hurricane recovery outbreak preventions.

What are the principal human resource and human resource management concerns (constraints, shortages, availability) in the ongoing COVID-19 crisis? Public health is changing with computer programs and needs for big data analysis and cloud computing. Many health care systems still fax their data. IT specialists and analysts are in high demand in the private sector, so CDC has a hard time competing for such talent. Shortages of talent in certain areas were a problem before COVID-19, but now the situation has been magnified. There are pronounced needs for more data science, artificial intelligence, and modeling expertise. Luckily, CDC has a deep bench of 22,000 contractors globally to fill emergency staff operations center call-ups. The toughest challenge is filling positions with the right people and the associated needs to perform in high-paced, changing environments, wearing multiple hats. CDC's strength lies in the motivation and volunteerism of its personnel – everyone loves the mission and coming together to help solve the problems. Yet there is a crying need for a stronger pipeline – in the form of more college Public Health programs and internships.

How, and how effectively, have these concerns/issues been dealt with? What measures/indicators are available for judging such effectiveness? It is too early to tell, but recent changes in CDC's responder profile tracker captures all essential skills, so it is increasingly easy to find and intentionally call up the right people. CDC now has Direct Hiring Authority, which has brought on more than 2000 personnel in the past week, along with a variety of statuses (permanent hires, contractors, temporary and term full-time employment, cooperative agreements, and grant/research support). Emergency human resource flexibility is provided by the first Stafford Act, which provides a range of new tools.

What process is instituted to mobilize additional human resources from various locales/ institutions to make up for shortfalls in: numbers, skills, expertise, and experience (for example, in (a) routine daily operations, (b) surge for short-term needs, and (3) mobilization for longer-term production needs)? Since surge equates to 30-60-day rotations, which is tough for turnover, CDC encourages longer-term commitments. Similar skills as HIV field program have been involved, so retooling has been relatively easy. Mobilization is a much tougher scenario, because many volunteers also work in communities as essential workers (safety inspectors, health professionals, nursing homes).

In the past, where have mobilized human resources generally come from? How effective were these measures? The Commissioned Corps – fulltime activated for augmentation (many working Indian reservation clinical care) – have generally filled this need. Referrals of friends from current staff have generally produced a non-expanding talent pool. The real challenge lies in taking non-infectious disease employees (vaping task force) and retrain them for infectious disease operations.

What are the lessons learned (specifically during this COVID-19 crisis) about the adequacy/ appropriateness of prior planning and preparedness activities? Can you share examples of improved practices/procedures for continued relevance and applicability for future disease outbreaks and for other, non-medical types of emergencies? CDC tries not to introduce new IT systems or administrative processes during crises, so staff can feel confident in established skill requirements, similar to medical deployments. The longer the pandemic lasts, the greater the likelihood of running out of people; so, there is a serious need to beef up the CDC bench.

Are there key infrastructure components missing for your human capital to utilize their full potentials? If you could double your funding, where should the U.S. Government invest? The overriding need is for a massive data modernization effort – to get 2500 local offices, 50 states, and eight territories all working off updated technology. With regard to the Defense Health Agency, it is too early to see the pros and cons of merging health agencies under this particular roof.

Do you feel the CDC is able to tell its story/narrative? If so, what is helping and if not, what needs to change? People are listening, but sometimes people don't like to hear what they don't want to put into practice. CDC is highly respected as a 73-year-old government agency.

If you could give advice to a large group of senior leaders across multiple government agencies, what would it be? Please help reduce Red Tape (in emergencies it goes away, but it could make daily operations much more efficient). Be willing to take risks to think differently; we need big changes to solve big, complex problems, not just minor, incremental tweaks.

SPACECOM Interview
Colonel Russell Klauman, U.S. Army

Interviewee: Colonel Debra Lovette, J-1

Significant Points:

- Currently SPACECOM is in its infancy in terms of development. The organization is still conducting what is basically its "needs assessment." Thus, determining the command's human capital requirements is fluid. Different staff sections commonly determine that they didn't scope personnel requirements correctly initially and therefore must refine requirements and assignments moving forward. For a new organization, it is common to tilt the personnel requirements in favor of the unit's primary operational focus. In this case, with the space capacity in the Army and Air Force being relatively small, it is impossible to at this point have enough pure "space" capacity to fill the demand. However, the organization has learned in the initial phases that "space" capacity is not always the best fit, and other specialties such as intelligence and cyber are more appropriate to best meet the requirements of the organization. By diversifying the requirements, recruitment and hiring will be less challenging.
- Training development is not currently a SPACECOM priority. As the organization is still establishing its foundation, the leadership is currently assuming risk with regard to training development. The interesting point is that the SPACECOM situation is almost the exact opposite of NORTHCOM's, in that NORTHCOM is challenged to recruit and hire enough talent that possess the knowledge and skills most current in their required career fields. However, because SPACECOM is the "shiny object" right now, many communities from the military send their most competitive and brightest talent to the command. From a technical standpoint, this sounds like an ideal situation, but from a leadership development and assignment perspective it has proven difficult to assign personnel appropriately to create a sound culture to help build the organization.

- There is considerable concern for establishing a sound staff with strong leadership. The senior leadership has made it a priority to establish a strong and effective leadership team to expand upon as the organization develops and fills its ranks. There is an emphasis on establishing processes and procedures that take care of employees both civilian and military. The approach seeks to establish predictability and efficiency in executing actions such as promotions, evaluations, Joint Credit processing, and other human capital actions.

EUCOM Interview
Colonel Kevin Poole, U.S. Army

Interviewee: COL Ryan Raymond, J-1

- EUCOM executes a full range of multi-domain operations in coordination with allies and partners to support NATO, deter Russia, assist in the defense of Israel, enable global operations, and counter trans-national threats in order to defend the homeland forward and fortify Euro-Atlantic security. With respect to human capital, the command focuses on planning policies and programs that enable workforce productivity as well as service member/civilian and family welfare. The command also provides administration, essential personnel services support, and combatant command level management of U.S. NATO manpower and strength accountability.
- Human capital management is essential to the command primarily because the command has to provide and manage personnel for agencies and components across the entire European continent. Not only is EUCOM responsible for providing human resources guidance to the subordinate service component commands, it is also responsible for ensuring that all U.S. contributions to NATO are filled with the right talent from across all the services. Included in this process is coordination with all the NATO Rapid Deployable Corps as well as the Joint Staff to identify and validate manpower requirements and then work with the respective services to fill them. Particularly for NATO units, there is an entire brigade (led by human capital professionals) that provides for and conducts individual Soldier and Family training, logistics, human resources, and service-specific support at remote NATO locations (all over Europe) in order to provide ready, resilient soldiers to NATO, maintain joint and multinational partnerships, and enhance the Alliance.
- Workforce development within the civilian population is difficult because the command is constrained by the 5-year rule. It is difficult to create pathways for progression that can benefit the command. Employees come to the command and work in one area of emphasis for the entire time they are in Europe. The command does train and develop employees, but they are oftentimes not in the theater long enough for the command to benefit from their development.
- The EUCOM staff is always in a continuous struggle to meet manpower requirements. An example of this is the recent reallocation of billets from EUCOM to INDOPACOM. The J1 had to manage a very delicate and deliberate process of identifying a 10% reduction of billets across the command. This required coordination with each service's equivalent of Human Resources Command as well as the Joint Staff and the J3 to ensure the right billets were spared in order to retain mission critical capabilities.

AFRICOM Interview
Colonel Kevin Poole, U.S. Army

Interviewee: CAPT Shane Harris, Chief, Military HR

- The United States Africa Command is the geographic combatant command responsible for advancing U.S. national interests and promoting regional security, stability, and prosperity by strengthening

security forces and responding to crises on the African continent. The primary mandate, from a human capital perspective, is to synchronize personnel support efforts for the joint force, manage the Joint Manpower Program, and provide personnel planning.

- Because the nature of AFRICOM is more focused on partnership capacity-building on the African continent, human capital is especially important to the organization and cannot be overstated. There are several initiatives that support this. The AFRICOM Military-to-Military program works with African militaries to improve the professionalism of their service members by acquainting them with U.S. military values, standards, and other relevant concepts with personal, face-to face contacts. The United States benefits from enhanced military professionalism since this in turn strengthens democratic values and stability.
- Internal to the command, talent management is a focus of senior leadership because of the complex nature of a joint environment. There exists the tendency for actions and initiatives to become "stove-piped" through individual services (Army, Navy, Air Force, Marines). The challenge of balancing Title X functions with Joint requirements precipitates a very deliberate, detailed approach to enacting even the most rudimentary human resources functions. The following are initiatives the J1 is working on to help streamline efficiencies within the command.
- As is the case with all the combatant commands, it is a challenge to meet current human capital requirements. It is even more complex when factoring in how the Joint Staff changes priorities from one combatant command to another from year to year.
- AFRICOM is in constant execution of its mission from a partnership/capacity-building perspective. Therefore, there are few differences between human capital management in peacetime and wartime. If, however, a major theater of war were to open up on the African continent, there would be less emphasis on long-term human capital development and more focus on manning the force, replacement, and casualty operations.

SOCEUR Interview
Lieutenant Colonel James Reed, U.S. Army

Interviewee: LTC James Kyle, SOCEUR J-1

How much of a priority (especially vis-à-vis other operational/administrative/budgetary priorities) are human capital/workforce development/talent management matters in your command? It is a priority, but intermediate leaders only push it when the command level (CG/COS/service element commanders) makes it a priority over operational requirements. Most of the time it is initiated from the bottom up (requester) and managed on a case-by-case basis.

What ongoing and planned programs/initiatives do you have that emphasize the importance of human capital/workforce development/talent management? SOCEUR has a civilian development program that was initiated last year. The program is focused on different career field training categories and nominative courses such as the USSOCOM civilian development course.

To what extent is your command able to meet current human capital/workforce development/talent management requirements/needs (skills, know-how, expertise, experience)? Do you expect appreciable changes in these requirements/needs in the future (near-term and longer-term)? In what areas? What is the basis of your future projections/estimates? With the resources that USSOCOM, the services, and the civilian career fields continue to exhibit, SOCEUR doesn't see any changes or possible increases. USSOCOM is responsible for training, manning, and equipping the SOF force, and continues to meet requirements for SOCEUR.

What similarities and differences exist in your approach to human capital/workforce development/talent management capabilities under routine/peacetime and emergency/wartime circumstances? Are there expected difficulties in transitioning from one to the other (mobilizing and/or demobilizing)? There are difficulties in units like SOCEUR, where sections aren't large, and skills are "one or two deep." During crises, leadership needs all resources and personnel and the best talent available, so they are reluctant to let personnel focus on development during these times. The COVID-19 crisis is an example of when development must be delayed.

Are there features of your command's approach to human capital/workforce development/talent management that (a) borrow heavily from practices in other public and/or private organizations, and/or (b) stand out as exemplary enough that they might be adopted by others? SOCEUR adapted its civilian program from USEUCOM, USSOCOM, and SOCCENT. An internal board is held for JPME II recommendations, which mirrors and feeds into the USEUCOM process.

United Nations High Commissioner for Refugees (UNHCR)
Colonel Jeri Hanes, U.S. Army

Interviewee: Ms. Jana Mason, External Relations/Government Affairs

The Office of the United Nations High Commissioner for Refugees (UNHCR) was established in 1950 to ensure legal protection and assistance to refugees. About 90 percent of UNCHR's 17,000 employees work in the field in one of 135 countries around the world. Some assignments are in harsh conditions and require family separations. Therefore, UNHCR is particularly attentive to recruiting, retention, and quality of life issues.

Human resources are UNHCR's biggest strength, and the organization invests considerable energy in human capital development. Consistent with this commitment, in 2018 UNHCR completed a full review of its human capital training and services. Subsequently, they introduced changes in strategic personnel development, data management, and organizational culture. Recent initiatives include establishing leadership and management training programs, required for career progression, within the UNHCR Global Learning and Development Center; creating the People Analytics Division to improve understanding of employee capacity and expertise; and publishing the Employee Value Proposition, a declaration of shared expectations between UNHCR leaders and subordinates.

In order to perform its mission, UNCHR coordinates services through non-governmental organizations (NGOs) and government agencies; and, in many cases, UNCHR delivers services itself. Within UNCHR, there are three broad job categories – standard, highly specialized, and expert. Employees within these categories may be hired as temporary, affiliate, or permanent employees. In order to improve recruiting and broaden its talent pipeline, UNCHR has recently began to allow affiliate employees to apply to internal job advertisements. Also, UNHCR has developed the Junior Professional Officer program, a special selection program for professionals between the ages of 25 and 35 from donor countries.

UNHCR's approach to human resource management is constrained at times by cultural and political parameters. Employees work internationally and in multicultural environments. Therefore, one general hiring parameter is that all employees must speak English and one other official UN language. A narrow constraint pertains to UNHCR's policy to gain host nation approval for Chiefs of Mission for UNHCR duty locations. In the past, host nations have vetoed a UNHCR selection because of the politics of the employee's country of origin.

The UNHCR has an established Emergency Response Team (ERT) to respond to emergency situations. This team is comprised of UNHCR employees across the globe who serve on the ERT for two years. In order to prepare, upon selection ERT members participate in a rigorous two-week field training exercise in Europe.

The UNHCR commitment to being a "people-centric" organization will help meet future operational requirements in terms of human capital. However, the organization must continue to develop human resource initiatives to encourage gender parity in hardship duty positions that lead to advancement within the organization; and, to streamline lengthy hiring processes that open the door to competition for talent from NGOs with similar missions.

International Organization for Migration
Colonel Jeri Hanes, U.S. Army

Interviewee: Mr. Brian Kelly, Head of Community Stabilization Unit

The International Organization for Migration (IOM) was established in 1951 to help facilitate movement of refugees from Europe into the United States, Australia and Canada. The UN Convention on Refugees established the Office of the United Nations High Commissioner for Refugees (UNHCR) as the mandated agency to provide support for refugees. Nonetheless, the number of displaced persons (those who have not crossed an international boundary) exceeds the number of refugees by a large factor. The IOM has a stronger role than UNHCR in assisting displaced persons. The IOM focuses on logistics – movement, care and custody of displaced persons – including camp management and resettlement. Also, IOM works with UNHCR on many "mixed-flows" crises, including the current partnership coordinating Venezuelan displaced persons and refugees.

Although IOM assigns a high level of importance to talent development, the organization is challenged by its project-based budget. About 97 percent of IOM's annual budget is built through an accumulation of projects funded by member-states. Therefore, training dollars are tied to improving employee delivery of a particular project and long-term development is difficult to fund. There is also less incentive for governments to fund soft-skill training that builds leadership and management skills. This is significant because IOM employees generally start in the field. IOM delivers services at a higher rate than many UN agencies (rather than coordinating services and relying on non-governmental organization partners to deliver). As its employees move from operational to leadership positions, IOM's project-based budget makes it more difficult to fund management training.

IOM pays significant attention to human resource considerations based on cultural differences. A large percentage of IOM's staff is comprised of nationals of the countries in which they work. While this enables IOM to have a robust network on the ground of people who understand local context and how that impacts delivery of services, they may not understand international norms. Therefore, IOM makes a substantial investment in providing a uniform level of employee understanding, represented by training on IOM Standards of Conduct. It is also worth noting that IOM's hiring model contributes to good opportunities for upward mobility by a diverse and international amalgam of personnel.

Consistent with IOM's project-based operations, the majority of employees are hired on a contract basis. It is common for an IOM employee to spend the first 10-12 years of their career moving from project to project and contract to contract. IOM classifies its hires as "back of the house" personnel, those with enduring skills associated with most projects (e.g., procurement, security, and human resources); or, personnel with "front of the house" project-specific skills related to one of IOM's 15 sectors of assistance.

The organization is trending up in terms of human capital development to meet future mission requirements. While long-term leadership development is a challenge, IOM mitigates this by dedicating a portion of the three percent of its budget that isn't project-based to institutional strengthening. Additionally, IOM's operational model builds an entrepreneurial and problem-solving capacity within its workforce that is less common in organizations with dedicated annual budgets.

U.S. Customs and Border Protection
Ms. Angela Noyes, U.S. Department of Homeland Security

Interviewee: Andrea Bright, Assistant Commissioner

U.S. Customs and Border Protection (CBP) has two overarching missions: securing the nation's borders by keeping people and materials from entering the country illegally; and, at the same time, facilitating legal trade and travel into the United States. CBP employs over 60,000 people and forms one of the largest law enforcement entities in the country, with Border Patrol agents deployed along over 6,000 miles of border and CBP officers stationed at over 300 ports of entry (POEs). This critical mission can be a benefit to recruiting, but some hiring challenges persist, such as hiring Border Patrol agents. Assistant Commissioner Bright guides the agency toward continuous improvements in hiring and supports the agency's investment in data analytics and statistical models to help in evaluating and leveraging hiring information.

Unique circumstances confront the agency regarding the hiring of Border Patrol agents. Part of the difficulty is that many agent assignments are in rugged and remote areas along the Southern Border, unattractive locations for families that often prefer more urban areas. Resiliency is also a concern. The work of CBP frontline law enforcement personnel, and in particular, Border Patrol agents, is dangerous and demanding. With the added stress of less desirable assignment locations, the agency sees more strain among agents deployed there. Presently, the law enforcement climate and public perceptions also make hiring more difficult. In terms of policy changes, the agency continuously assesses its polygraph policy to determine whether it is using the right kind of polygraphs in the screening process.

Emergency operations add pressure to an already difficult job. In the case of the current coronavirus crisis, there is heightened concern for the physical, emotional, and financial health of the workforce. Most employees have frontline roles and cannot telework. Instead, they must report to their regular duty locations on the border or at the POEs, where they may be exposed to the coronavirus at higher rates than most people. While the crisis is challenging the agency, it is also offering opportunities for change. CBP leadership envisions the possibility of building a CBP-specific reserve component so that recently retired personnel could quickly come back to work in any future crises.

During the recent border crisis, the agency saw increased numbers of people, including family units with children, attempting to cross the border illegally. Border Patrol agents worked a taxing operational tempo with no ability to take leave, and many agents tried to help by donating supplies and toys to children held at the stations. The crisis rippled quickly throughout the agency. CBP officers were pulled from their POE jobs to work on the border, often at a distance from their homes. These re-locations caused disturbances at their home ports and also weighed on their families. While it stressed the agency, the ability to flex to different assignments was also a source of strength in dealing with the crisis. CBP officers added to the National Guard surge force and to employees from across the Department of Homeland Security, who volunteered to help on the border.

With the demanding mission, CBP has special programs to help support employees. In addition to an Employee Assistance Program, CBP has Peer Support, Chaplaincy, and Veterans support programs. The agency offers training in mindfulness, resilience, and healthy relationships. During the coronavirus crisis, the agency is responding in unique ways, for example, connecting some employees or their families with online 12-step meetings to help them remain active in recovery programs during social distancing.
To stay abreast of employee health and resiliency, Ms. Bright monitors the Federal Employee Viewpoint Survey (FEVS), in addition to other statistics. She is interested in finding better and more meaningful wellness measures that can help her understand how specific CBP wellness programs are serving people and what the agency may need to do differently.

United Nations Division for Sustainable Development Goals
Colonel Catalin-Constantin Samoila, Romanian Army

Interviewee: Mr. Amson Sibanda

Following the 15-year Sustainable Development Agenda 2030, promulgated in 2015 by UN member states, progress has been made in the most critical area. Extreme poverty has declined, as well as child mortality, due to immunization. On educational grounds, the number of children and young adults enrolled in education/training has increased, and consequently, so have literacy rates. Also, inequality has lessened across countries. However, in some African regions, especially those where conflicts are ongoing, extreme poverty has not only stagnated; it has increased.

In general, there is still a long way to go for full implementation of the Agenda 2030's 17 Sustainable Development Goals (SDGs). The SDG implementation pace varies from country to country. In Africa, Ethiopia has made some good progress. Full SDG implementation, however, must look at the global picture. It could not be said which country is leading without a more profound country by country analysis.

Among the essential contributors to the continuous implementation of SDGs, political will (leadership, commitment) comes first. Most countries have integrated the 2030 Agenda into national plans. Allocating financial resources, especially increasing the domestic share, is also critical – at least it has been so in the last two years when part of the dedicated funds was redirected to approach the global refugee crisis. Some good progress has been made concerning technologic transfer, but still, intellectual property regulatory issues need to be addressed.

Many challenges have impeded fuller SDG implementation – among them, the effects of climate change, deforestation, desertification, and other natural disasters (such as the locust infestation now happening in the Middle East and Africa). Such will delay the implementation of SDGs 1 (no poverty) and 2 (zero hunger), but it will also affect the implementation of SDG 4 (quality education), since part of the funds targeted for it will be redirected to buy food instead of building schools.

Despite progress, there isn't much optimism about SDGs 4, 8 (decent work and economic growth), 9 (industry, innovation, and infrastructure), and 12 (responsible consumption and production). Because of significant income disparities (where groups of people are left behind, especially African indigenous communities), qualified teachers are still missing (due to lack of incentive), which has led to low proficiency in reading and mathematics and resulted in difficulties closing the gaps from country to country. The political environment has impacted economic growth (e.g., U.S.-China competition), as some national economies depend heavily on commodity exports. Their vast territories require investments in infrastructure, which have not been accomplished at a satisfactory pace. Moreover, the economic recession generated by the COVID-19 crisis will put further economic pressure on all countries, affecting the implementation of SDG 12. The U.S. decision to halt funding to the World Health Organization would lead to difficulties regarding the implementation of SDG 3 (good health and well-being) and 6 (clean water and sanitation), as part of the money was designed to fight against diseases like malaria, and to ensure clean water and better sanitation.

All of the SDGs are essential – and interrelated. Therefore, it is hard to say which ones are more important than others: improvements in education vs. improvements in healthcare, for example. Human capital, efficiency, and productivity can hardly develop when basic needs (well-being) aren't being met, and gender inequality still exists. The UN encourages countries to strive to achieve all objectives, understanding that in some situations, trade-offs may be necessary. As lessons are learned, countries need to ensure they promote policies to reduce waste across all economic sectors, to address climate change better, and prevent natural disasters. Besides, contingency plans for unexpected natural shocks need to be developed and implemented as needed.

Notes

[1] American Institute of Physics, "Important Reading: New Augustine Report on U.S. Competitiveness," December 14, 2007. https://www.aip.org/fyi/2007/important-reading-new-augustine-report-us-competitiveness (accessed April 22, 2020).

[2] Patrick Wright and Gary McMahan, "Exploring Human Capital: Putting 'Human' Back into Strategic Human Resource Management," *Human Resource Management Journal* 21, no. 2 (2011): 93-104.

[3] Charles Wheelan, *Naked Economics: Undressing the Dismal Science* (New York, NY: W.W. Norton, 2019), 132.

[4] Corine Boon, Rory Eckardt, David Lepak, and Paul Boselie, "Integrating Strategic Human Capital and Strategic Human Resource Management," *The International Journal of Human Resource Management* 29, no. 1 (2018): 34-67.

[5] Donald Trump, "National Security Strategy of the United States of America," The White House, December 18, 2017. https://www.whitehouse.gov/wp-content/uploads/2017/12/NSS-Final-12-18-2017-0905.pdf (accessed March 17, 2020).

[6] Robert Goldenkoff, "Government Accountability Office and Federal Human Capital Issues," ES 6767 Industry Studies (AY20): Strategic Human Capital (seminar lecture, National Defense University, Washington, DC, February 3, 2020).

[7] Devin O'Connor, "Human Capital Development," ES 6767 Industry Studies (AY20): Strategic Human Capital (seminar lecture, National Defense University, Washington, DC, March 9, 2020).

[8] Ibid.

[9] Ibid.

[10] Roland Edwards, "Department of Homeland Security: Strategic Human Capital," ES 6767 Industry Studies (AY20): Strategic Human Capital (seminar lecture, National Defense University, Washington, DC, January 14, 2020).

[11] Ken Merten and Bob Leavitt, "U.S. Department of State and U.S. Agency for International Development Strategic Human Capital," ES 6767 Industry Studies (AY20): Strategic Human Capital (seminar lecture, National Defense University, Washington, DC, January 24, 2020).

[12] Ibid.

[13] Allen Zeman, "Center for Human Capital Innovation," ES 6767 Industry Studies (AY20): Strategic Human Capital (seminar lecture, National Defense University, Washington, DC, February 13, 2020).

[14] Ibid.

[15] Ibid.

[16] Ibid.

[17] Ibid.

[18] Dane Linn, "The Business Roundtable: Strategic Human Capital," ES 6767 Industry Studies (AY20): Strategic Human Capital (seminar lecture, National Defense University, Washington, DC, January 28, 2020).

[19] Ibid.

[20] Matthew Brink, "Future of Work: Landscape, Trends, and Predication," ES 6767 Industry Studies (AY20): Strategic Human Capital (seminar lecture, National Defense University, Washington, DC, March 3, 2020).

[21] Ibid.

[22] Carolyn Lee, "Industry Perspective: Future Workforce Issues," ES 6767 Industry Studies (AY20): Strategic Human Capital (seminar lecture, National Defense University, Washington, DC, February 7, 2020).

[23] Ibid.

[24] Ibid.

[25] Sherry Van Sloun, "Intelligence Community Human Capital: Right, Trusted, Agile Workforce," ES 6767 Industry Studies (AY20): Strategic Human Capital (seminar lecture, National Defense University, Washington, DC, January 28, 2020).

[26] Ibid.

[27] Ibid.

[28] Ibid.

[29] Ibid.

[30] George G. Gordon, "Industry Determinants of Organizational Culture," *The Academy of Management Review* 16, no. 2 (1991), 396-415.

[31] Ryan Changcoco, Maria Ho, and Morgean Hirt, "Association for Talent Development," ES 6767 Industry Studies (AY20): Strategic Human Capital (seminar lecture, National Defense University, Washington, DC, March 6, 2020).

[32] Ibid.

[33] Ibid.

[34] John Forsythe, "Human Capital Trends: Deloitte Consulting," ES 6767 Industry Studies (AY20): Strategic Human Capital (seminar lecture, National Defense University, Washington, DC, February 20, 2020).

[35] Ibid.

[36] Ibid.

[37] Ibid.

[38] Matthew Brink, "Future of Work: Landscape, Trends, and Predication," ES 6767 Industry Studies (AY20): Strategic Human Capital (seminar lecture, National Defense University, Washington, DC, March 3, 2020).

[39] Dane Linn, "The Business Roundtable: Strategic Human Capital," ES 6767 Industry Studies (AY20): Strategic Human Capital (seminar lecture, National Defense University, Washington, DC, January 28, 2020).

[40] Ibid.

[41] David Langdon, "Federal Workforce Perspective: American Workforce Policy Advisory Board," ES 6767 Industry Studies (AY20): Strategic Human Capital (seminar lecture, National Defense University, Washington, DC, March 9, 2020).

[42] Ibid.

[43] Ibid.

[44] Ibid.

[45] Michael Wolf, "U.S. Occupational Outlook 2018-2028," ES 6767 Industry Studies (AY20): Strategic Human Capital (seminar lecture, National Defense University, Washington, DC, January 6, 2020).

[46] Ibid.

[47] Ibid.

[48] Ibid.

[49] Andy Van Kleunen, "National Skills Coaltion," ES 6767 Industry Studies (AY20): Strategic Human Capital (seminar lecture, National Defense University, Washington, DC, February 13, 2020).

[50] Ibid.

[51] Ibid.

[52] Carolyn Lee, "Industry Perspective: Future Workforce Issues," ES 6767 Industry Studies (AY20): Strategic Human Capital (seminar lecture, National Defense University, Washington, DC, February 7, 2020).

[53] Ibid.

[54] Jennifer Worth, "The Important Role of Community College," ES 6767 Industry Studies (AY20): Strategic Human Capital (seminar lecture, National Defense University, Washington, DC, March 6, 2020).

[55] Ibid.

[56] Ibid.

[57] Michelle Marks, "A Professional Educator's Talent Perspective," ES 6767 Industry Studies (AY20): Strategic Human Capital (seminar lecture, National Defense University, Washington, DC, February 13, 2020).

[58] Ibid.

[59] Ibid.

[60] Ibid.

[61] Ibid.

[62] Dane Linn, "The Business Roundtable: Strategic Human Capital," ES 6767 Industry Studies (AY20): Strategic Human Capital (seminar lecture, National Defense University, Washington, DC, January 28, 2020).

[63] Jeanne Contardo, "Capital CoLab/Greater Washington Partnership," ES 6767 Industry Studies (AY20): Strategic Human Capital (seminar lecture, National Defense University, Washington, DC, February 11, 2020).

[64] Ibid.

[65] Anita Blair and Lernes Hebert, "DoD Stakeholder Perspectives, Issues, and Concerns," ES 6767 Industry Studies (AY20): Strategic Human Capital (seminar lecture, National Defense University, Washington, DC, January 10, 2020).

[66] Ibid.

[67] Ibid.

[68] Robert Goldenkoff, "Government Accountability Office and Federal Human Capital Issues," ES 6767 Industry Studies (AY20): Strategic Human Capital (seminar lecture, National Defense University, Washington, DC, February 3, 2020).

[69] Ibid.

[70] Ibid.

[71] Hye Jin Rho, "Think Tank Analytical Perspective," ES 6767 Industry Studies (AY20): Strategic Human Capital (seminar lecture, National Defense University, Washington, DC, February 3, 2020).

[72] Ibid.

[73] Ibid.

[74] Matthew Brink, "Future of Work: Landscape, Trends, and Predication," ES 6767 Industry Studies (AY20): Strategic Human Capital (seminar lecture, National Defense University, Washington, DC, March 3, 2020).

[75] Ibid.

[76] Michael Wolf, "U.S. Occupational Outlook 2018-2028," ES 6767 Industry Studies (AY20): Strategic Human Capital (seminar lecture, National Defense University, Washington, DC, January 6, 2020).

[77] Ibid.

[78] David Goldman, "US-China decoupling: a reality check," *Asia Times Financial*, April 14, 2020.

[79] L3Harris, "Electronic Warfare," *What We Do.* https://www.harris.com/what-we-do/electronic-warfare (accessed April 16, 2020).

[80] "Missile Defense," Wikimedia Foundation. https://en.wikipedia.org/wiki/Missile_defense (accessed April 14, 2020).

[81] Interviewed student (anonymous) in the Missile Defense Industry Study, February 28, 2020.

[82] SAIC, United States Securities and Exchange Commission Form 10K, filed March 27, 2020.

[83] Ibid.

[84] Ibid.

[85] Ibid.

[86] Lindy Kyzer, "How Long Does It Take to Get a Security Clearance (Q1 2018)," *Clearance Jobs*, March 13, 2018, https://news.clearancejobs.com/2018/03/13/long-take-get-security-clearance-q1-2018/, accessed April 14, 2020.

[87] SAIC, "SAIC Completes Acquisition of Unisys Federal." https://investors.saic.com/press-releases/press-release-details/2020/SAIC-Completes-Acquisition-of-Unisys-Federal/default.aspx (accessed April 14, 2020).

[88] Ibid.

[89] SAIC, "SAIC Vision and Core Values." https://www.saic.com/who-we-are/about-saic/vision-and-core-values (accessed April 14, 2020).

[90] SAIC, United States Securities and Exchange Commission Form 10K, filed March 27, 2020.

[91] SAIC, "SAIC Expands Philanthropic Support for Military, Veteran Families." https://www.saic.com/features/saic-expands-philanthropic-support-for-military-and-veteran-families (accessed April 14, 2020).

[92] SAIC, "SAIC Corporate Governance | SAIC Political Activities." https://investors.saic.com/corporate-governance/saic-political-activities/default.aspx (accessed April 16, 2020).

[93] "Fact sheet: Workforce Development at HII," Huntington Ingalls Industries, September 1, 2019.

[94] Bill Ermatinger (HR EVP, Chief Human Resources Officer), "Huntington Ingalls Industries: Taking a 'Grow Your Own' Approach to Workforce Development," *Huntington Ingalls Industries*, December 11, 2019.

[95] Bill Ermatinger, discussion with the author, February 27, 2020.

[96] World Bank, "Singapore: Human Capital Index Report." https://databank.worldbank.org/data/download/hci/HCI_2pager_SGP.pdf (accessed April 7, 2020).

[97] Ibid.

[98] World Bank, "Human Capital Index and Components, 2018." https://www.worldbank.org/en/data/interactive/2018/10/18/human-capital-index-and-components-2018 (accessed April 7, 2020).

[99] Ibid.

[100] United Nations Development Programme, "Human Development Data (1990-2018)." http://hdr.undp.org/en/data# (accessed April 7, 2020).

[101] Ibid.

[102] Central Intelligence Agency, "World Factbook: Singapore." https://www.cia.gov/library/publications/the-world-factbook/ (accessed April 7, 2020).

[103] World Bank, "Singapore: Human Capital Index Report." https://databank.worldbank.org/data/download/hci/HCI_2pager_SGP.pdf (accessed April 7, 2020).

[104] U.S. Department of State, "2019 Country Reports on Human Rights Practices: Singapore." https://www.state.gov/reports/2019-country-reports-on-human-rights-practices/singapore/ (accessed April 15, 2020).

[105] World Bank, "The Human Capital Project," *World Bank*, Washington, DC., 2018, 39, https://openknowledge.worldbank.org/handle/10986/30498.

[106] Ibid.

[107] Global Innovation Index, "Country Comparison of Austria and the United States of America." https://www.globalinnovationindex.org/analysis-comparison, (accessed April 13, 2020).

[108] Ibid.

[109] Ibid.

[110] Ibid.

[111] Bachelors Portal, "Study in Austria." https://www.bachelorsportal.com/countries/3/austria.html (accessed April 13, 2020).

[112] BFI.WIEN, "The Austrian Education System." https://www.bfi.wien/ueber-uns/austrian-education-system/ (accessed April 14, 2020).

[113] Austrian Embassy Washington, "Fact and Figures: Economy." https://www.austria.org/economy (accessed April 14, 2020).

[114] World Bank, "The Human Capital Project," *World Bank*, Washington, DC., 2018, 42, https://openknowledge.worldbank.org/handle/10986/30498.

[115] Austrian Embassy Washington, "Fact and Figures: The Welfare State." https://www.austria.org/the-welfare-state (accessed April 14, 2020).

[116] Ibid.

[117] Europa, "Austria." https://s3platform.jrc.ec.europa.eu/documents/20182/318091/Austria.pdf/5df1e186-86fd-4f77-998f-fc9b113bf6fd (accessed April 14, 2020).