TALENT MANAGEMENT AFTER NEXT

– EVOLUTION OF THE PEOPLE STRATEGY

About This Document

This document was written by a research team at the United States Army War College (USAWC) as a part of the Futures Seminar for Academic Year 2020. This report answers questions posed by Dr. Casey Wardynski, Assistant Secretary of the Army for Manpower and Reserve Affairs (ASA M&RA). The team's task was to analyze and synthesize an estimate from open-source information relevant to the questions posed:

- *What are the elements of a talent-based approach to Army personnel management that will reveal market requirements while meeting Army demands in relative real-time and provide feedback through a self- learning system?*

- *Additionally, what procedural and cultural impediments likely stand in the way of an agile system that allows the Army to adapt to these new demands through acquisition avenues or modifications to the development of the Army's existing talent?*

This briefing book comes in both an electronic (PDF) and a hard-copy format. The electronic version should be considered the primary version for any future reference. In addition to the documentary version, there will also be a supporting presentation and Q&A by the research team to Dr. Wardynski at a date and time TBD.

This overall estimate is made with *moderate* analytic confidence. The questions asked were complex and the timeline was relatively short due to competing academic requirements of the USAWC core curriculum. Source reliability and corroboration were moderate to high. The analysts, non-subject matter experts, worked both individually and collaboratively to answer the questions. They utilized a combination of structured analytic techniques including nominal group technique and network analysis among others. The team evaluated their analytic confidence utilizing Petersons Analytic Confidence Factors (see Appendix E) coupled with the Friedman Corollaries (see Appendix F).

Throughout this document, the authors used *Words of Estimative Probability* according to the ATP 2-33.4, Table 3-1, Subjective Probability Table (See Appendix D for details).

In lieu of footnotes throughout the body of the document, the team hyperlinked sources at the end of the sentences. Each hyperlink is designated with either a superscripted "H", "M ", or "L" indicating whether the author considers the source to have high, moderate, or low credibility. The team used the Norman Online Source Credibility Scale to determine the level of online source credibility (See Appendix G for details). The hyperlinked letters in the electronic version of the document will route the reader to the appropriate source, many of which are websites or other source documents.

For a copy of any of these products, please contact the authors or Prof. Kristan Wheaton, kristan.wheaton@armywarcollege.edu

Vincent A. Amerena Sr.
vincent.a.amerena.mil@mail.mil

Steven M. Clark
steven.m.clark30.mil@mail.mil

Andrew L. Heymann
andrew.l.heymann.mil@mail.mil

Martin D. Lepak
martin.d.lepak.mil@mail.mil

John A. Urciuoli
john.a.urciuoli.mil@mail.mil

Talent Management After Next – Evolution of the People Strategy

What are the elements of a talent-based approach to Army personnel management that will reveal market requirements while meeting Army demands in relative real-time and provide feedback through a self-learning system?

Based on 15 future essential conditions for talent (8) and the Army (7) it is *likely* that a talent-based approach to personnel management will have 12 elements that will reveal market requirements while meeting Army demands.

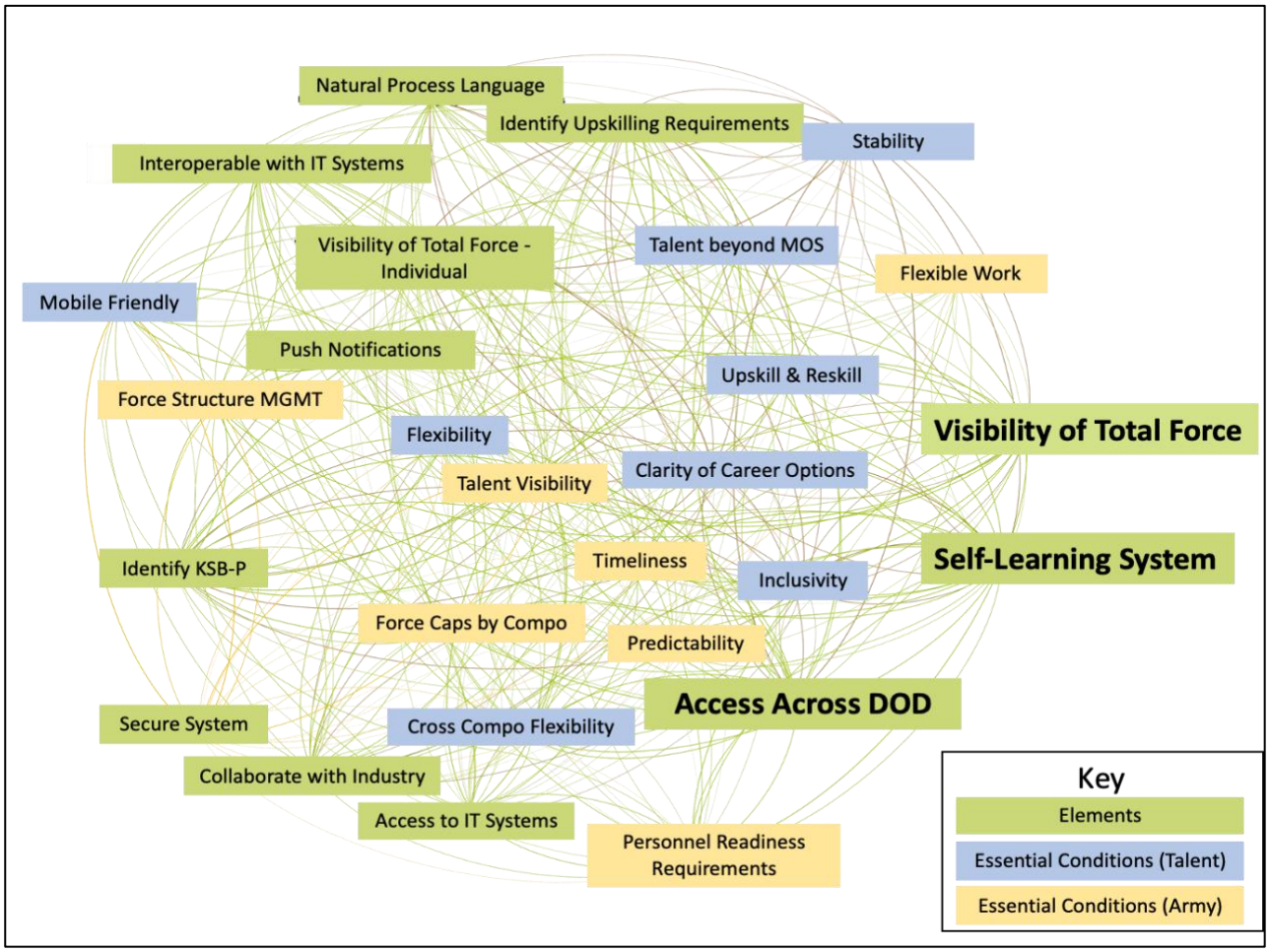


Figure 1. Network Analysis of the Relationship of Elements to Essential Conditions

This figure shows all 12 elements and how they relate to the 15 essential conditions. The team determined the 7 essential conditions for the Army through a thorough review of the Army's current talent management strategy, personal experience, and research into future talent management requirements of large organizations. The team determined the 8 essential conditions for the future workforce, the talent, through a careful examination of various demographic and future-of-work studies. The team combined these findings and coupled them with a review of future focused talent management literature to determine the elements of the system. The team conducted personal interviews with large multinational corporations and software designers to corroborate and expand the findings. Finally, the relationships were all evaluated for impact. The final rank order is based on the weighted value and is depicted above.

While all 12 elements are *highly likely* critical to the overall functionality of the system, looked at as a network; 3 elements *likely* have the greatest impact on both the Army's and the talent's essential conditions (needs/demands) (See Figure 1).

These 3 elements are:

- Self-Learning System
- Visibility of total force availability by the Army
- Expandable access to personnel inventory across the DOD

Essential Element: Self-Learning System

It is *highly likely* that creating a **self-learning system** is the single most important element in a future talent-based approach to personnel management. Specifically, a self-learning system helps satisfy 5 of 7 identified essential conditions for the Army including Timeliness, Force Structure Management, and Army Flexibility.

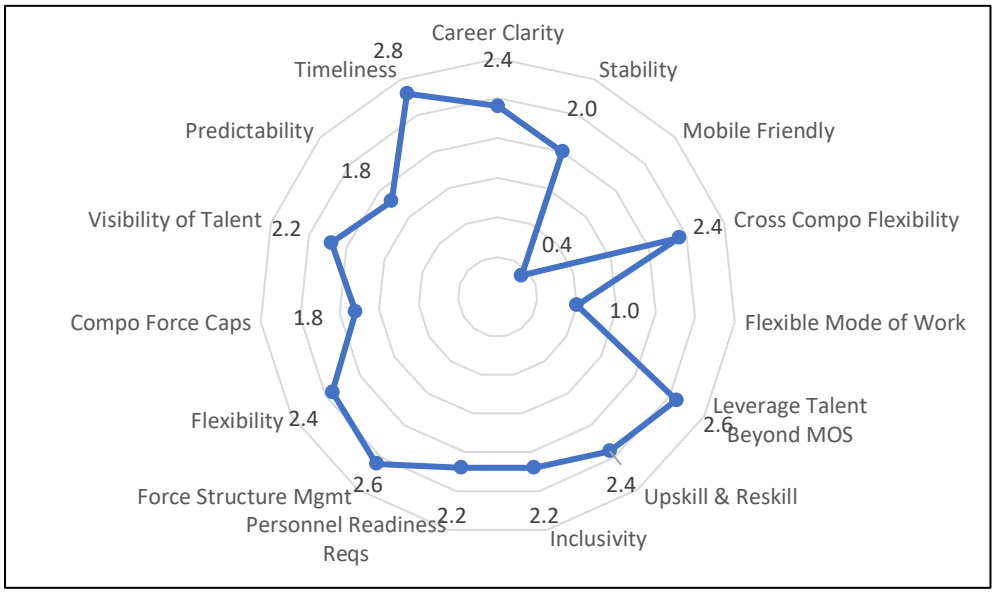


Figure 2. Self-Learning System Radar Chart

The figure shows how the element of Self-Learning impacts the essential conditions of the Army and Talent. The closer the number gets to "3" the stronger the connection between the element and the essential condition.

Likewise, it helps satisfy 5 of 8 identified essential conditions for the future workforce including such critical elements of Leverage of Talent beyond MOS/AOC, Upskill & Reskill, and Cross Compo Flexibility (See Figure 2).

The combination of AI and ML is key to a successful self-learning system in future talent management functions.

- The combination of technologies is transforming how industry leaders recruit new talent. For example, Amber Grewal, Vice President of Global Talent Acquisitions for

IBM stated "Overall, this is a story about data providing you with exponential learning opportunities and better decision-making capabilities. In talent acquisition at IBM, incorporating AI into the recruiting and sourcing functions augments our recruiters' ability to make better decisions that drives more business value."

- A recent study by Mercer University indicated that 59% of U.S. companies plan to increase their use of automation in HR this year. Additionally, another study showed 31% of firms' primary HR automation use is AI. Among the remainder of respondents, 58% placed AI in their top three programs used in the hiring process.

- Harvard Business Review (HBR) in describing the use of AI and ML in the recruiting process states "Machine learning models have the potential to find important but previously unconsidered relationships." HBR describes how AI and ML provide organizations opportunities to screen applicants with greater fidelity and confidence that they otherwise could not perform using human recruiters. Technologies like chatbots, natural language processing, and skill matching algorithms are technologies developed and employed in the screening process of recruiting.

Essential Element: Visibility of Total Force

It is *highly likely* that **visibility of total force** is the second most important element in a future talent-based approach to personnel management. Specifically, visibility of the total force helps satisfy 6 of 7 identified essential conditions for the Army including Force Structure Management, Personnel Readiness Requirements, and Army Flexibility.

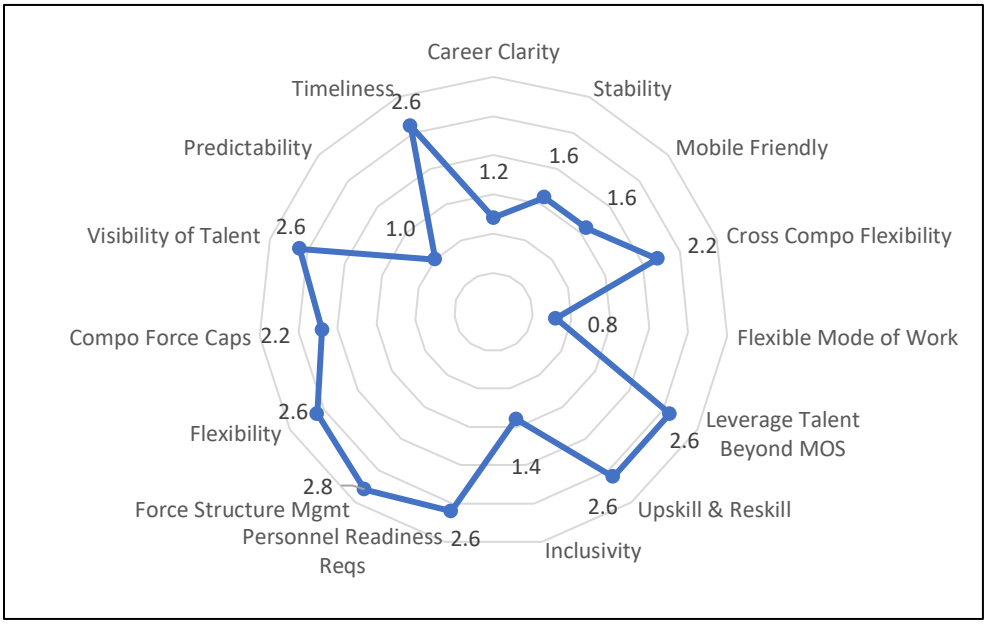


Figure 3: Visibility of Total Force Radar Chart

The figure shows how the element of Visibility of Total Force impacts the essential conditions of the Army and Talent. The closer the number gets to "3" the stronger the connection between the element and the essential condition.

Likewise, it helps satisfy 3 of 8 identified essential conditions for the future workforce including such critical elements of Leverage of Talent beyond MOS/AOC, Upskill & Reskill, and Cross Component Flexibility (See Figure 3).

The advancement of AI, blockchain, the Internet of Things, and workforce analytics will allow large organizations to consolidate human resource management functions, including talent management, into one system. A future system will allow predictive and prescriptive capabilities giving organizations and individuals real-time visibility of talent and opportunities within an organization. Companies such as Adepto, HireVue, and TalentNet are already working on such systems (See Figure 4).

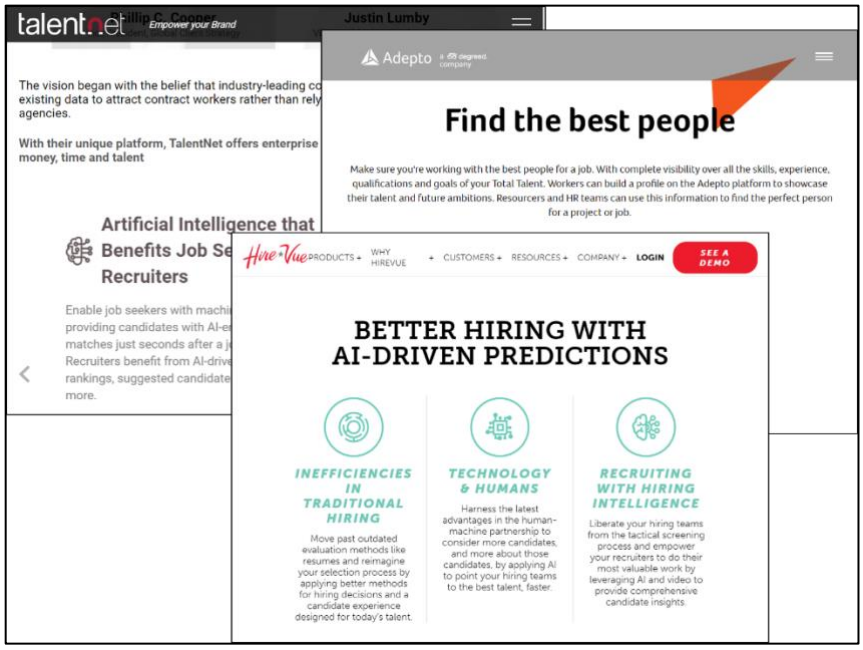


Figure 4. Talent Management Systems
Source: Adepto, HireVue, & TalentNet

The screenshots are examples of leaders within the talent management system industry.

- According to PricewaterhouseCoopers, organizations that are able to upskill their current employees are finding a 2-to-1 return on their investment. Likewise, based on research from the World Economic Forum emerging occupations are estimated to grow from 16% to 27% globally by 2022 and create approximately 133 million new job roles. Research from Brookings shows that nearly 30% of young adults will not graduate from secondary school with the skills they need to hold most jobs and there is an estimated skill gap of 500,000 in many technology positions.

- Worldwide organizations with multi-industry operations like IBM are finding ways to gain visibility of their talent across the organization. Mark Foster, Senior Vice President of IBM Global Business Services states "Organizations are facing an unprecedented convergence of technological, social and regulatory forces. As artificial intelligence, machine learning, automation, internet of things, blockchain, and 5G become pervasive, their combined impact will reshape standard business architectures."

- As emerging technology, automation, robotics, and the use of AI shape the character of the workplace, it is *highly likely* that more than 50% of workers will need to upskill to remain agile, relevant, and adaptable in the workforce.

Essential Element: Expandable Access to Personnel Inventory Across the DOD

It is *highly likely* that **expandable access to personnel inventory across the DOD** is the third most important element in a future talent-based approach to personnel management. Specifically, expandable access to personnel inventory across the DOD helps satisfy 6 of 7 identified essential conditions for the Army including Force Structure Management, Visibility of Talent, Personnel Readiness Requirement, and Timeliness and Army Flexibility.

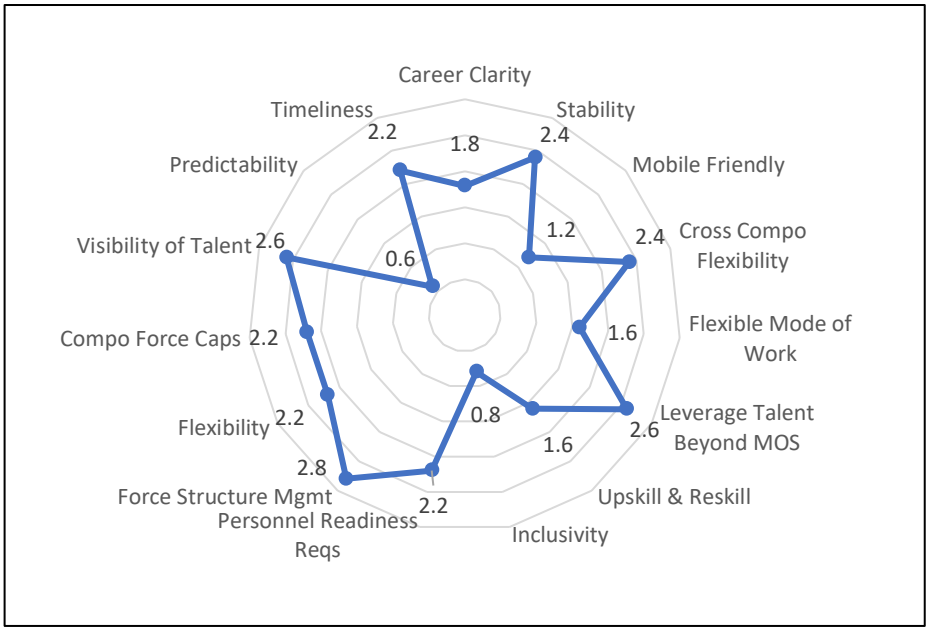


Figure 5: Expandable Access to Personnel Inventory Across the DOD Radar Chart

The figure shows how the element of Expandable Access to Personnel Inventory Across the DOD Radar Chart impacts the essential conditions of the Army and Talent. The closer the number gets to "3" the stronger the connection between the element and the essential condition.

Likewise, it helps satisfy 3 of 8 identified essential conditions for the future workforce including such critical elements of Leverage of Talent beyond MOS/AOC, Stability, and Cross Component Flexibility (See Figure 5).

The Army will need to expand its access to talent pools across the DOD in order to meet emerging personnel requirements.

- Successive Chairmen of the Joint Chiefs have concluded that given the threats of contested norms and persistent disorder, the Joint Force will be challenged as never before, and interoperability is key to the successful execution of military objectives. If we combine the increased competition for eligible recruits across all services, it is *highly likely* that the U.S. Army will look across the DOD for shared use of talent to meet mission requirements.

- According to Forbes, Generation Z is bringing a new view of work and outlook on the world as they enter the workforce. In a 2019 survey conducted by RippleMatch (See Figure 6), further validated by additional research from Ernst and Young, of college students preparing to enter the workforce across 12 global economies, business students ranked high future earnings as the most attractive attribute for an employer (49.1%), followed by professional training and development (43.8%), secure employment (39.1%) and a good reference for their future career (38.8%). Among their career goals were work-life balance (52.8%), to be secure or stable in their job (45.2%) and to be a leader or manager of people (35.5%).

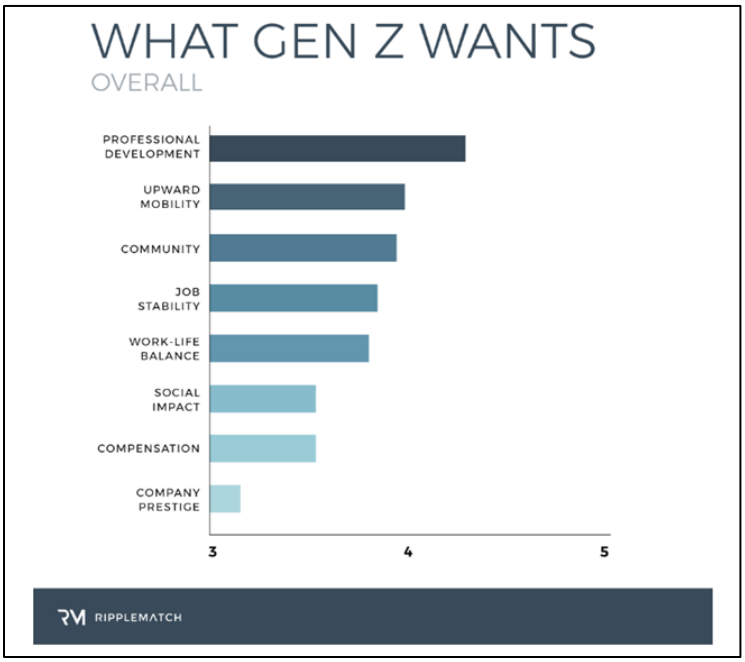


Figure 6: What Gen Z Wants, Ranking of importance 1-5
Source: Ripplematch

- Army recruiting challenges include a declining number of 17-24-year individuals in the U.S. predicted by the year 2035. The current population of the 17-24 year old demographic is 34 million, however, it will drop by 18% to approximately 27.8 million by 2035.

- Reduction in the overall population will be further exacerbated by the expected increase of ineligibility overall from 71% to 74% due to several factors such as decreased fitness, increased obesity, and legal issues. In its research, the American Action Forum projects America to have a 5.6% shortage of bachelor degreed workers by 2029.

What procedural and cultural impediments likely stand in the way of an agile system that allows the Army to adapt to these new demands through acquisition avenues or modification to the development of the Army's existing talent?

Five *likely* procedural and cultural impediments, in addition to what is included in the Talent Management Concept of the Operation for Force 2025 and Beyond, are identified; in priority order they are:

- Mobile Access to Talent Marketplace
- Army Civilian Hiring Practices
- Stability
- Military Compensation
- Physical Requirements

Key Impediment: Mobile Access to Talent Marketplace

Of the five additional impediments, it is *highly likely* that lack of **mobile access to the talent marketplace** stands out as a critical impediment to a future talent-based approach to personnel management. Specifically, mobile access to talent marketplace significantly impacts 7 of 12 elements of a future talent-based approach to personnel management including Collaborate with Industry, Appropriate Access to the System, and Secure System (See Figure 7).

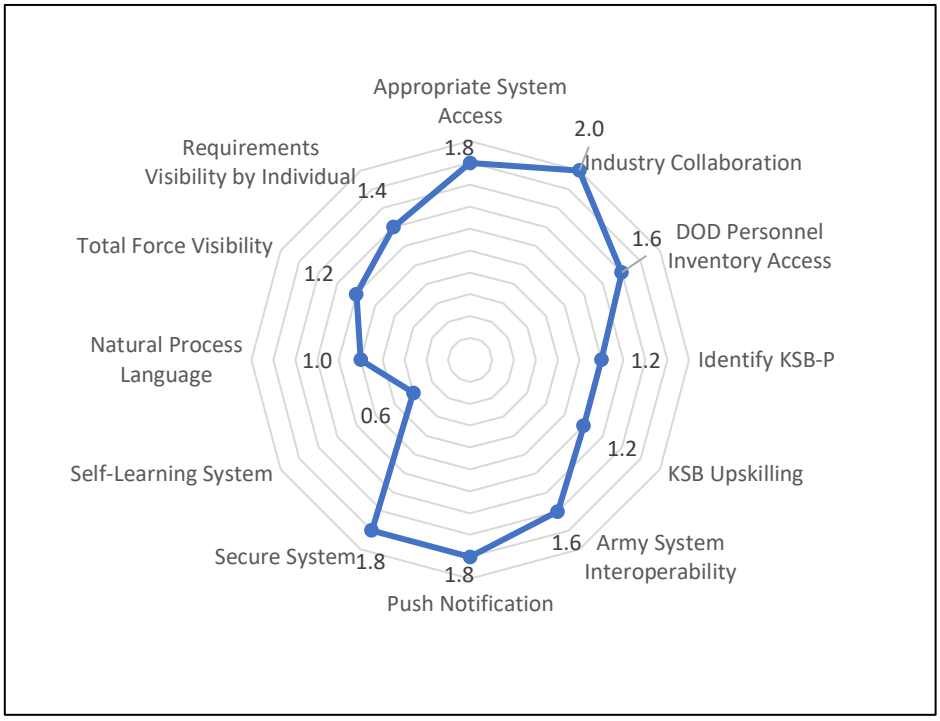


Figure 7. Mobile Access to Talent Marketplace Radar Chart

How Mobile Access to Talent Marketplace impacts the elements of a future talent management system. The closer the number gets to "2" the stronger the connection between impediment and elements.

As a result of mobile applications across industry sectors, it is *highly likely* organizations will leverage mobile applications and notification to capitalize on the technological advancements and the saturation of mobile devices. Advancements in mobile application technology are accelerating with the inclusion of Artificial Intelligence, 5G, and Beacon Technology Process.

- With the pervasive ownership and usage of smartphones, according to Help Net Security, average US users receive 46 app push notifications/day with 40% of those being from the E-commerce or media, publishing, and blogging sectors. A report by Strategy Analyst predicts that the number of connected devices will reach 50 billion by 2030 (See Figure 8).

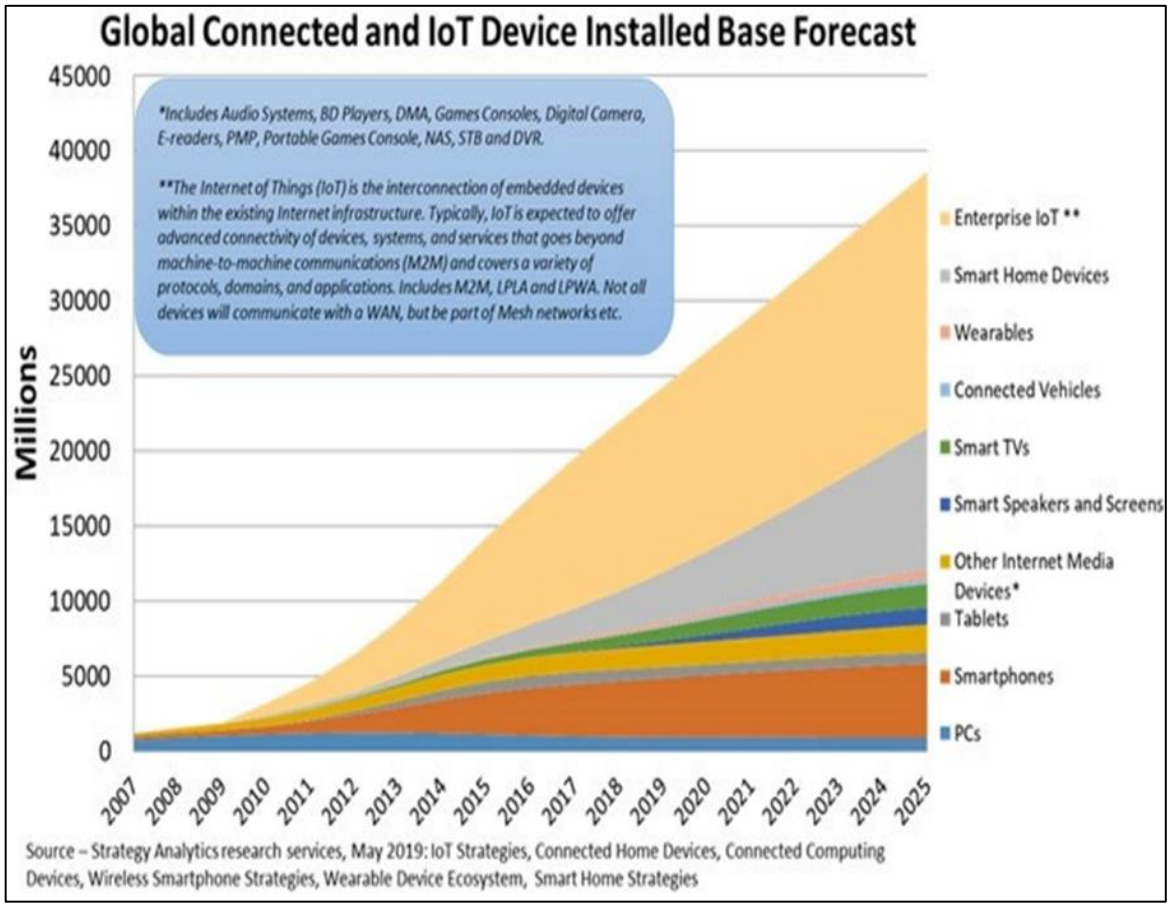


Figure 8. Forecast Global Connectivity Source: HelpNetSecurity

The figure shows the growth in the number of devices connected to the internet, including Enterprise Internet of Things (IoT) devices, smart phones, smart TVs, etc.

- Gen Z, according to research by Cushman & Wakefield, will be between at least 30% and 40% of the workforce in 2035 and are digital natives. Based on recent research by CoinFund they will seek a single source of truth system in their organization's Human Resource Information System.

Relationship of Essential Elements to The Army People Strategy's Lines of Effort (LOEs)

The focus of this study has been on the far future of talent management and has looked almost exclusively at the future needs of the Army and its workforce. However, several places the LOEs from The Army People Strategy might converge with future talent management approaches. To communicate this, we assessed the impact of the 12 essential elements across the four lines of effort of The Army People Strategy (Acquire, Develop, Employ, and Retain). This approach identifies the elements that present potential opportunities to leverage some current programs in support of future needs. An example of the analysis that can be applied using this data is shown below using the three most important essential element from our research. The complete set of data can be found in Appendix B.

> **The Army must place a greater emphasis on acquiring the right people through better screening and assessments allowing us save and reinvest valuable resources by reducing attrition. – Army People Strategy 2020**

Self-Learning System

Self-Learning System correlates strongly with three of the four LOEs from The Army People Strategy. (See Figure 9).

As a future system learns through AI and ML, current and emerging gaps will be identified, allowing the Army to identify people to leverage their skills thus maximizing output. This future system will more efficiently align the force with positions that unleash and individuals' passions and talents.

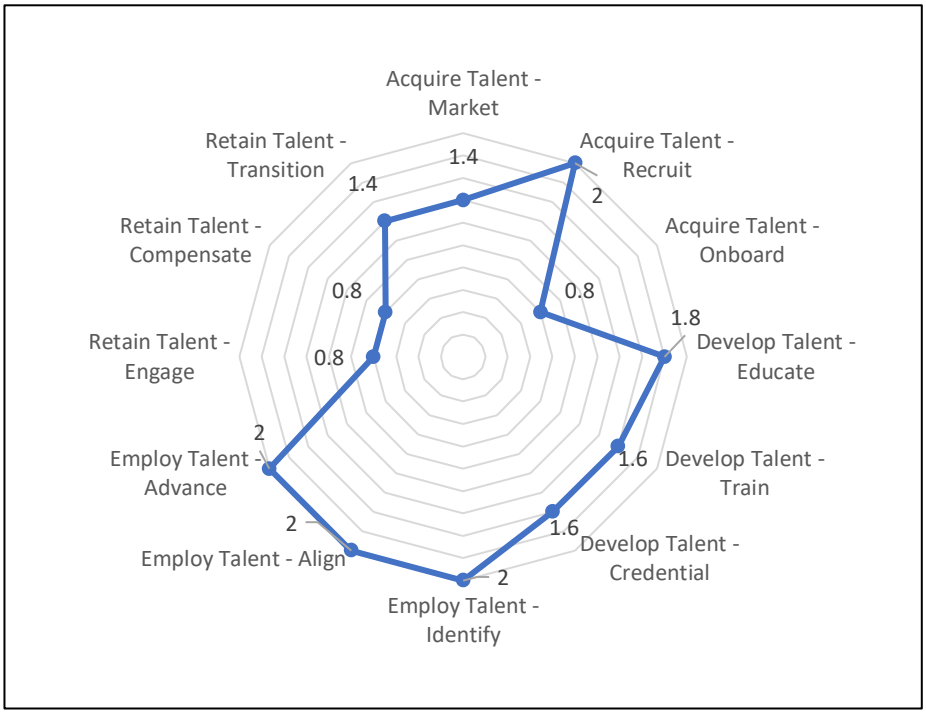


Figure 9. Self-Learning System Radar Chart

How the element of Self-Learning System impacts The Army People Strategy LOEs. The closer the number the gets to "2" the stronger the connection between the element and LOEs.

A future talent-based approach to personnel management may well impact the acquisition of talent through recruiting as marketing efforts identify individuals who are

responsive to marketing efforts. Concurrently a future approach to talent management will identify individuals and opportunities for advancement based on demonstrated capabilities. Ideally, a self-learning system will identify the educational needs of the force in order to develop talent to meet current shortfalls while meeting emerging needs.

Visibility of Total Force

Visibility of the Total Force correlates strongly with all four LOEs from The Army People Strategy. (See Figure 10).

Visibility within a future talent-based approach to talent management effectively allows the Army to identify and assess gaps that can be recruited and filled as needed by a future talent-management system.

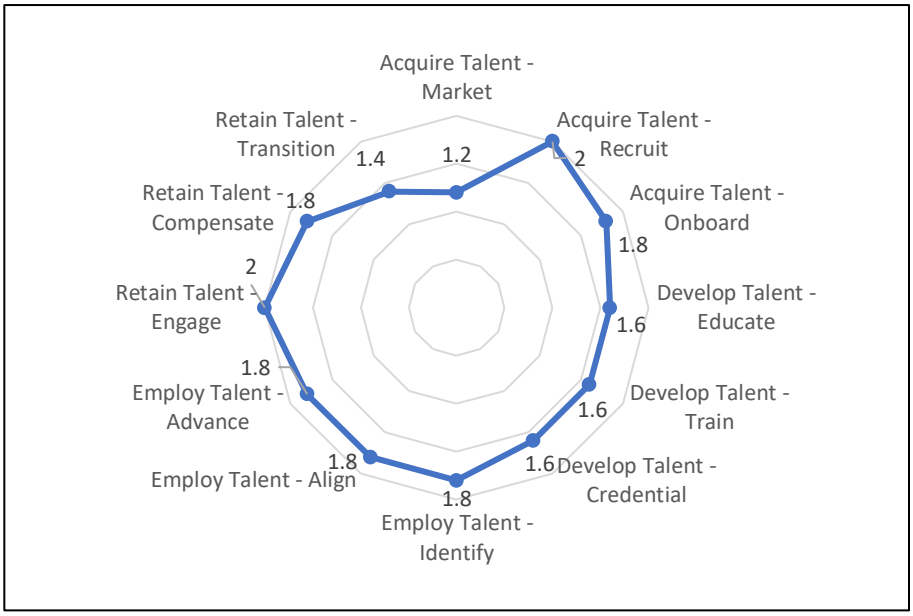


Figure 10. Visibility of Total Force Radar Chart

How the element of Visibility of Total Force impacts The Army People Strategy LOEs. The closer the number the gets to "2" the stronger the connection between the element and LOEs.

Improved visibility impacts the employment of talent equally across all avenues by identifying requirements where talent can then be aligned against.

Expandable Access to Personnel Inventory Across the DOD

Expandable Access to Personnel Inventory Across the DOD most strongly correlate to 1 of 4 of the LOEs within The Army People Strategy (See Figure 11).

Expandable visibility across the DOD will increase talent identification and employment across the Army. Army's access to personnel will include, but is not limited to, the joint force, DA Civilians, select retirees, and personnel currently in the acquisition pipeline who have knowledge, skills, and attributes to meet emerging personnel requirements.

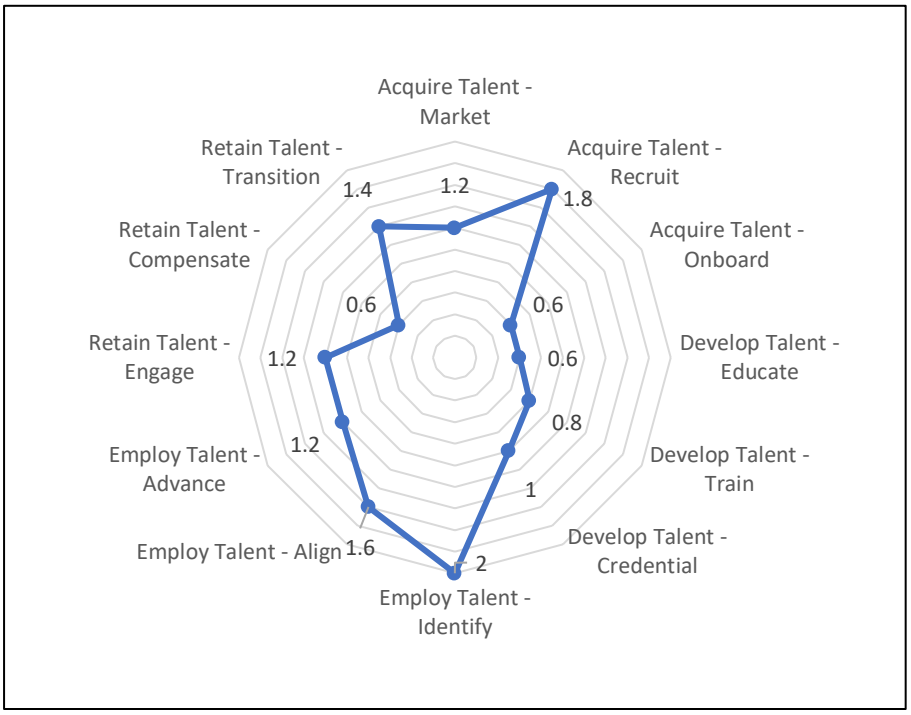


Figure 11. Expandable Access to Personnel Inventory Across the DOD Radar Chart

How the element of Expandable Access to Personnel Inventory Across the DOD impacts The Army People Strategy LOEs. The closer the number the gets to "2" the stronger the connection between the element and LOEs.

Table of Contents

The 12 essential elements of a talent-based approach to Army personnel management system:

Appropriate access to the system: An Army personnel management system requires graduated access and authorities to view and input purposes of the information within the system. Permissions vary across the Army depending on the level of command from Army Staff and Human Resource Command down to the Brigade or Battalion/Squadron S1/Staff. An Army personnel management system should have the appropriate level of access to conduct inquiries of personnel data, information, and KSBs; input requisite data, information, and KSBs for the appropriate level; and view appropriate reports to allow the commander to make decisions.

Collaborate with industry for talent acquisition: The system should collaborate with industry partners to share information on talent required to feed the Army's line of effort to acquire and recruit talent to fill current and future requirements. An Army personnel management system should leverage talent acquisition through collaboration with professional personnel networks such as, but not limited to, LinkedIn, Glassdoor, Adepto, TalentNet, RallyPoint, Opportunity, etc. to help identify potential talent for targeted recruiting and acquisition needs.

Expandable access to personnel inventory across the DOD: Ideally, the system is expandable to identify potential personnel from across the DOD, to include, but not limited to the joint force, DA Civilians, select retirees, and personnel currently in the acquisition pipeline who have the KSB to meet personnel requirements.

Identify Knowledge, Skills, Behaviors, and Preferences (KSB-P): The system requires the means to identify and validate KSB-P to match talent with validated requirements. Ideally, an Army personnel system will provide matches of individuals with KSB-Ps that are above a 65% or greater match to the requirements. The system provides names to units in enough time to allow a leader to interview personnel ensuring the requirement is met in the allocated personnel timeline.

Identify upskilling requirements to test and certify for KSBs: The system will identify requirement shortfalls within critical KSBs, based on current and emerging Army KSB inventories, and recommend appropriate upskilling strategies. Ideally, the system will suggest individuals with similar KSBs who may are potential candidates for upskilling in time to reduce the shortage of those critical KSBs or assist with acquiring personnel to fill Army shortages.

Interoperable with information systems across the Army enterprise: The system requires interoperability across Army enterprise information systems to assist in ensuring decisions are being made using the most recent information across all components, budgetary cycles, force planning and manning systems, operational requirements, training, readiness, personnel, and pay systems.

Push notifications, both to the Army and to the individual: The system will integrate technologies to push notifications appropriately to individuals who meet screened KSB criteria of validated requirements in time to meet Army demands.

Secure system: The system will meet DOD information security standards to protect networks, systems, and data from unauthorized access, use, disclosure, disruption, modification, or destruction. The system will be accessible worldwide across multiple digital platforms to authorized users.

Self-learning system: The system incorporates machine learning (ML) and artificial intelligence (AI) to identify existing and emerging personnel requirements and identify qualified talent to meet requirements. The system will use ML and AI to assist the Army in tasks such as, but not limited to, targeted marketing and recruiting efforts, identifying current and future educational requirements, assisting with force design updates based on known and emerging requirements, and assisting in identifying existing and emerging talent requirements.

Use of natural process language search capabilities: In order to take advantage of machine learning (ML) and artificial intelligence (AI) in the future, the system should integrate natural language process search capabilities. Natural language processing (NLP) processes and analyzes large amounts of natural language data within information systems. The use of NLP will compliment ML and AI in matching current and future Army personnel requirements with personnel databases listing KSB-Ps.

Visibility of total force availability by the Army: The system must have complete visibility of the total force available across all components (AD, ARNG, USAR, IRR) to meet Army validated requirements.

Visibility of total force requirements by the individual: The system must provide visibility of validated requirements across all components (AD, ARNG, USAR) to the individual for visibility of opportunities.

Essential Elements Supporting Research

Essential Element: *Self-Learning System*

Advancements in artificial intelligence and machine learning in self-learning systems make scientific validity, reliability and the ability to predict and prescribe highly probable in talent management systems

Executive Summary

Due to advancements of artificial intelligence (AI) and machine learning (ML) it is *highly probable* an Army of 2035 self-learning HR system will bring scientific validity, reliability and the ability to predict and prescribe. This advancement will transform how the Army manages talent (acquires, develops, employs, and retains) and force structure. Despite the cost, complexity, constraints by small data sets and ethically and socially appropriate use of data concerns, AI and ML will transform the management of talent. With a self-learning system, Soldiers will have the opportunity to utilize and employ their KSB's across the Total Force, be informed and identified for personalized professional development and retained with focused benefits. It is highly *likely* that, without an innovative self-learning system, an industry will lose the competitive advantage in the talent marketplace and against global competitors and adversaries.

Discussion

Combining AI and ML into talent acquisition is transforming how business's recruit new talent. According to Peter Cappelli, Professor and Director of the Center for Human Resources at the Pennsylvania University, "Machine learning models have the potential to find important but previously unconsidered relationships."[H] Both AI and ML provide opportunities that allow businesses to screen applicants with great fidelity and confidence that they will perform and embrace the culture of an organization. Chatbots, natural language processing and skill matching algorithms are technologies that were developed in the last several years. Amber Grewal, Vice President Global Talent Acquisition, IBM says, "Overall, this is a story about data providing you with exponential learning opportunities and better decision-making capabilities. In talent acquisition at IBM, incorporating AI into the recruiting and sourcing functions augments our recruiters' ability to make better decisions that drives more business value."[M]

As appealing as AI and ML is for the acquisition of talent, they are unlikely to replace the human recruiter. As depicted in the attached quad chart, AI (and ML) should be designed to augment, inform and continuously learn from their interaction with humans and the environment. The human recruiter must leverage the information that AI and ML provide but must not acquiesce the decision making to these technologies.

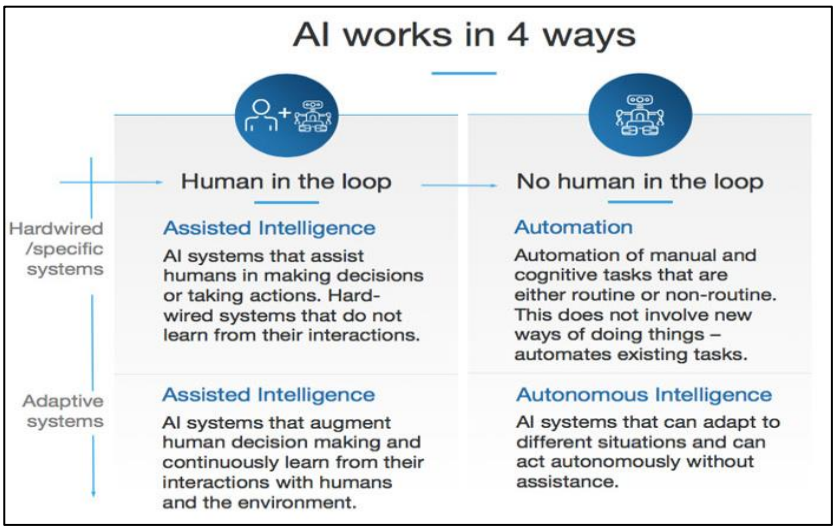


Figure 1: How AI Works. Source: Business.linkedin.com

Currently, according to Andrew Spewak, a senior research associate at the Federal Reserve Bank of St. Louis, "with the unpredictability of people, workforce analytics tends to be more backward-looking than forward-looking. For example, it is easier to understand who is leaving, and why, than to forecast which employees will leave in the future".[H]

The goal of workforce analytics in a self-learning system is to eventually move to predicting and prescribing the acquisition, development, employment and retention of the workforce and inform emerging force design requirements. Figure 2 depicts current workforce analytics with describing and diagnosing. However, in the future the goal with AI, ML and workforce analytics is to move into the predicting (what could happen) and prescribing (what should happen).[H]

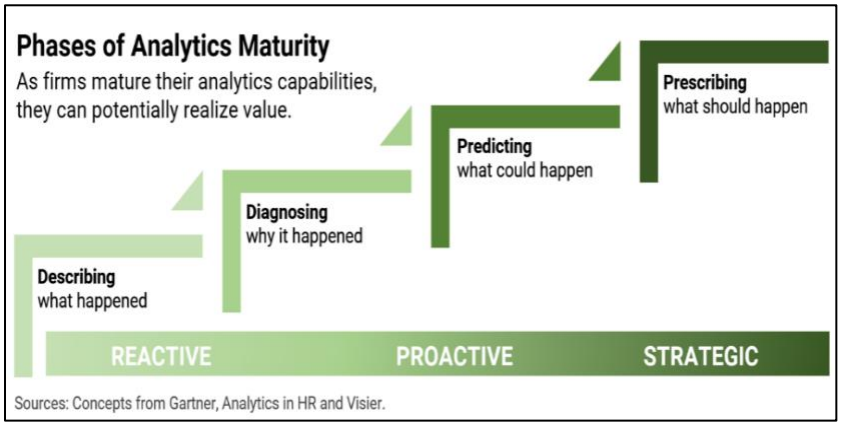


Figure 2: This diagram shows a company's progression in analytics. Stair steps show how firms can mature from using analytics to describe what happened, to diagnosing why something happened, to predicting what could happen in the future, to finally prescribing what ought to happen.

Source: Federal Reserve Bank of St. Louis

An HR study in *The International Arab Journal of Information Technology,* proposed a framework that included an input subsystem, decision making subsystem and output subsystem with ten HR application modules that attempts to "solve HR problems by applying hybrid intelligent techniques such as ML and knowledge-based approach for new knowledge extraction and prediction."[H] See Figure 3 of the study's proposed HR system.

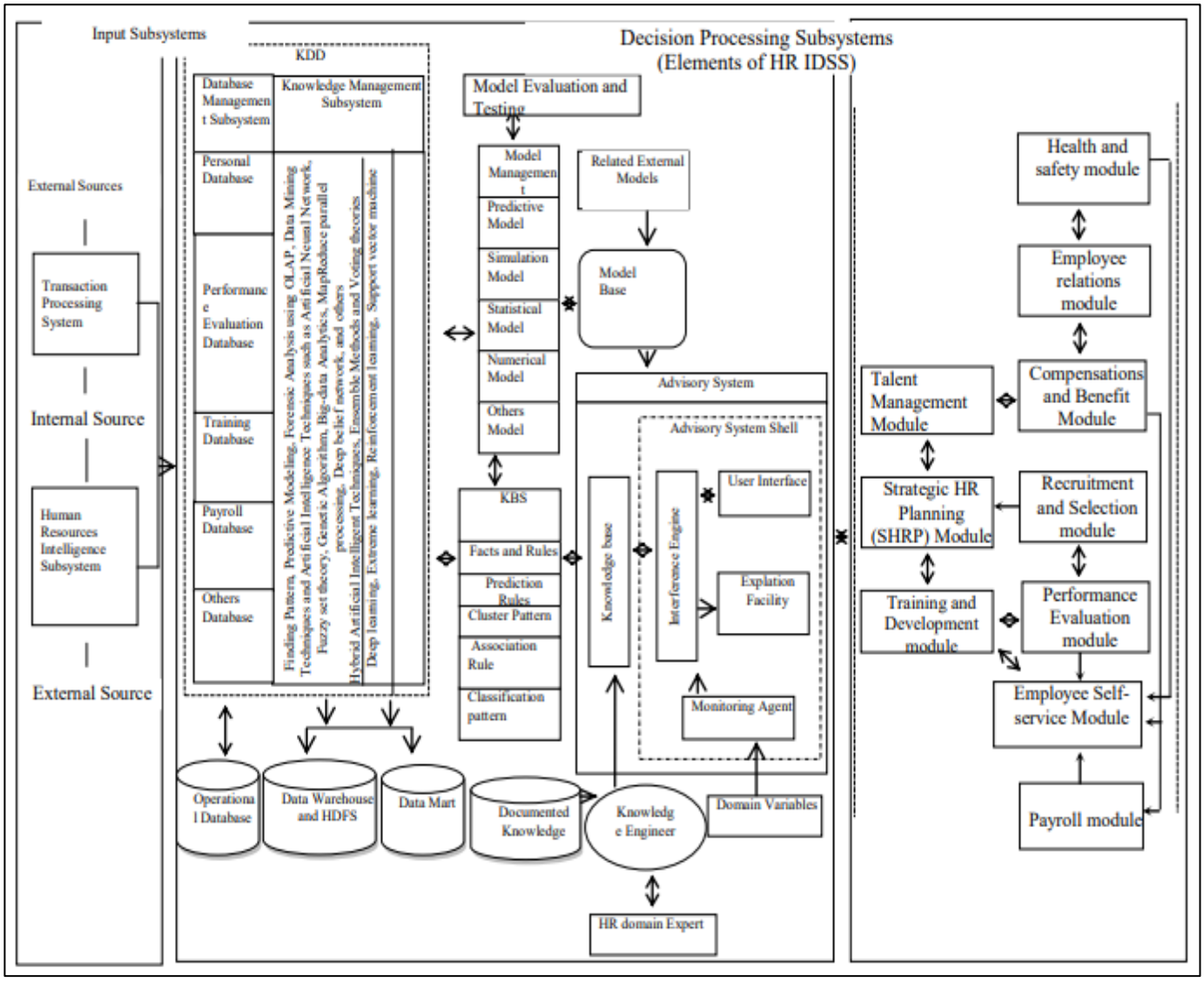


Figure 3: Model of an Intelligence Based Human Resource Intelligence Subsystem
Source: The International Arab Journal of Information Technology

Despite the appealing benefits of a self-learning system there are several concerns:

- The cost of developing a system that informs leaders and decision makers of the type of talent and force structure required is extensive in both dollars and man-hours.
- The complexity of a workforce and force design analytics system that is responsive, accurate, and informs decision making is daunting and requires the right talent and intelligent processing of large amounts of data in creating the system.
- Constraints by small data sets. Earnest data collection is needed immediately in order to set the stage for success in identifying the talent and force design required for the future force.
- Ethically and socially appropriate use of data is a concern, especially the collection of data on people.

Mark A. Huselid is a Distinguished Professor of Workforce Analytics and Director of the Center for Workforce Analytics in the D'Amore-McKim School of Business at Northeastern University states:

> "There is peril in this opportunity. Incorrect, biased, or unethical decisions, once enabled by analytics, may be made not only much more quickly but also become embedded in the organization's processes and routines and become difficult to change. Thus, it is important for workforce metrics and analytics systems to be grounded in the highest-quality social science research methods and statistics."[H]

Analytic Confidence

The analytic confidence for this estimate is high. The reliability of the sources is high. The sources and accompanied analysis all tended to corroborate each other irrespective of location in the world. There was adequate time and the task was not complex.

Author: Martin D. Lepak

Essential Element: *Total Force Visibility*

It is highly likely that large, worldwide multi-industry organizations will employ a predictive and prescriptive, interoperable Human Resource system by 2035

Executive Summary

It is *highly likely* large, worldwide multi-industry organizations will employ an interoperable human resource (HR) system that allows predictive and prescriptive capabilities while the organization and the individual have real time visibility by 2035. The advancement of Artificial Intelligence (AI), blockchain, the Internet of Things (IoT) and workforce analytics will allow organizations to consolidate all human resource requirements, including talent management, into one system to fully leverage HR operations and talent in worldwide, multi-industry organizations. Despite the complexity and cost of a predictive and prescriptive single resource system, current technological advancements project by 2035, worldwide multi-industry organizations will be able to operate with a single human resource system.

Discussion

Worldwide organizations with multi-industry operations are leveraging the advancement of technology to improve human resource systems. Mark Foster, Senior Vice President of IBM Global Business Services says, "A new era of business reinvention is dawning. Organizations are facing an unprecedented convergence of technological, social and regulatory forces. As artificial intelligence (AI), automation, Internet of Things (IoT), blockchain and 5G become pervasive, their combined impact will reshape standard business architectures. The "outside-in" digital transformation of the past decade is giving way to the "inside-out" potential of data exploited with these exponential technologies."[H] (See Figure 1).

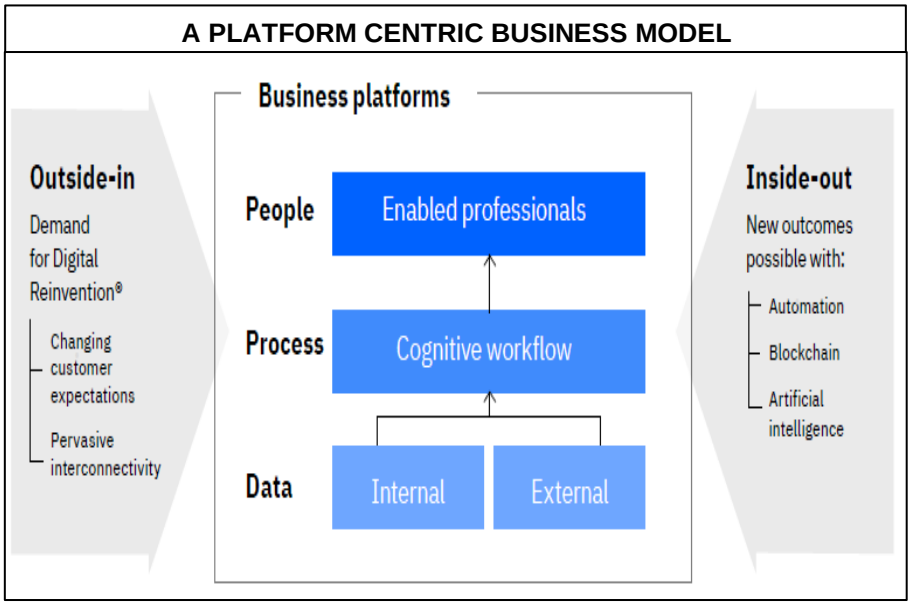


Figure 1: Example of a Platform Business Model. Source: IBM

Currently, the unpredictability of understanding how people act, think and believe drive workforce analytics to be more backward-looking than forward-looking. For example, it is easier to understand who is leaving, and why, than to forecast which employees will leave in the future.[H] The goal with workforce analytics is to eventually move to predicting and prescribing the acquisition, development, employment and retention of the workforce. However, in the future the goal is to move into the predicting (what could happen) and prescribing (what should happen) with AI, ML and workforce analytics. When this occurs, leaders of organizations will have a longer term, dedicated and more talented workforce to meet the operational and company vision and goals.

The emerging field of workforce analytics holds considerable promise for leaders hoping to significantly improve their operational and strategic performance through more effective workforce management. By extension, better data and analytics also have the potential to help employees manage and improve their own careers, through more effective feedback and career pathing systems.[H]

However, the advancement and convergence of AI, ML, IoT and workforce analytics in the private sector human resource arena make for a promising outlook. In a 2020 study by KPGM of over 1300 HR executives around the world, they concluded, "The power of the next generation of HR isn't in pursuing disconnected capabilities; rather, it is in creating a holistic and mutually reinforcing "whole system" approach to building the workforce (and organization) of the future. It lies in an organization's ability to integrate new capabilities, taking a worker-centric view while addressing cultural shifts and embracing an increasingly digital workforce."[H]

Analytic Confidence

The analytic confidence for this estimate is high. The reliability of the sources is high. The sources and accompanied analysis all tended to corroborate each other irrespective of location in the world. There was adequate time and the task was not complex.

Author: Martin D. Lepak

Essential Element: *Expandable Access to Personnel Inventory Across the DOD*

DOD highly likely to increase interoperability of Joint Force to meet global security threats in operating environment of 2035

Executive Summary

Successive Chairmen of the Joint Chiefs have concluded that given the threats of contested norms and persistent disorder, the Joint Force will be challenged as never before, and interoperability is *highly likely* the key to successful execution of military objectives. The Goldwater-Nichols Act of 1986 mandated greater interoperability between services within the Department of Defense. Since the passage of this law, DOD has experienced mixed success at achieving the goals of Goldwater-Nichols. Despite previous history of inter-service rivalries and stovepipe approaches to their contribution to the joint force, the projections for the operating environment of 2035 will *highly likely* require much closer assimilation of the Joint Force beyond the current integration of distinct service doctrine which "melds" doctrine rather than creating true synergy. The DOD budget request for FY 2021 called for spending $705 billion with a focus on modernization, readiness, and increasing the interoperability of the Joint Force.

Discussion

Two distinct sets of challenges can describe the security environment of 2035. (See Figure 1). The first is contested norms, in which increasingly powerful revisionist states and select non-state actors will use all elements of power to establish rules in ways unfavorable to the United States and its interests. The second is persistent disorder, characterized by an array of weak states that become increasingly incapable of maintaining domestic order or good governance. These challenges are *likely* to disrupt or otherwise undermine a security environment that will remain largely favorable to the United States, but less overtly congruent

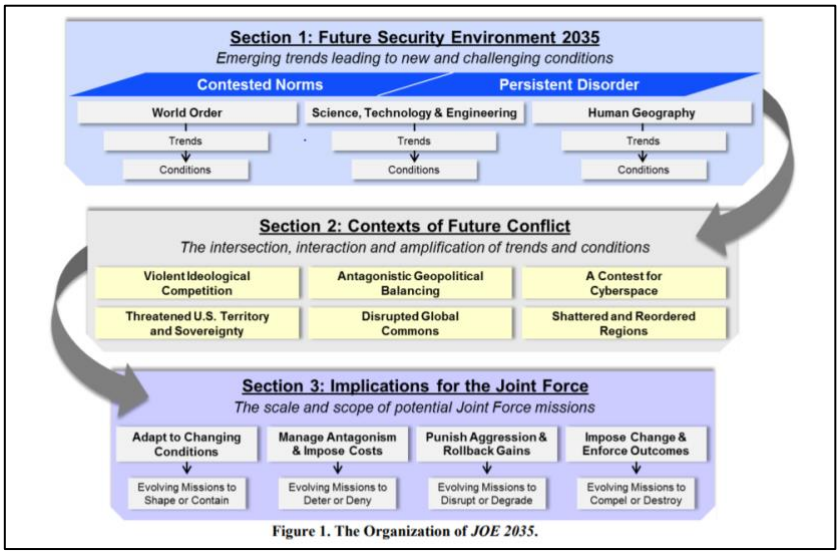


Figure 1: Organization of the Joint Operating Environment 2035. Source: Joint Operating Environment 2035

with U.S. interests. H It is *highly likely* that the United States will increasingly rely on the interoperability of the Joint Force to meet these challenges.

A combination of more capable competitors, more dangerous threats, and greater fiscal uncertainty is *likely* to make unilateral action by the United States more difficult and potentially less effective in 2035. Therefore, the United States will continue to pursue collective security arrangements with a large set of capable and often ideologically or culturally compatible actors. While the strategic importance of these relationships is *likely* to grow, diverse changes will make them more difficult to manage and operate.

A recent study by TRADOC asserts that the joint force should no longer assume continuous superiority in any domain. Potential adversaries are increasing their capabilities and contesting U.S. forces in domains where U.S. dominance has historically been uncontested. H For the past several decades, the Joint Force has experienced freedom of action in the air, land, maritime, space, and cyberspace domains. However, an increase in the number and capability of malign global actors present significant challenges to friendly forces' access to and action within air, maritime, space, and cyberspace domains from extended distances. These adversaries also contest U.S. strategic relationships with allies and partners because of reduced U.S. forward presence. The Multi-Domain Battle Concept was developed to combat these trends and relies on increased joint force interoperability and decrease in the seams between services. H

Another challenge to historic service parochialism is the reality of tighter defense budgets.(See Figure 2) The DOD faces the decision of balancing the need for modernization, maintaining readiness, and increasing end strength. H Given the reality of budgets forecast into the future, achieving greater efficiency and lethality from the Joint Force through greater streamlining of processes and increasing operational interoperability is key to meeting the challenges of the National Defense Strategy. H The Chairman of the Joint Chief of Staff may have to be more directive to ensure efficiencies are maintained to make best use of the DOD's resources.

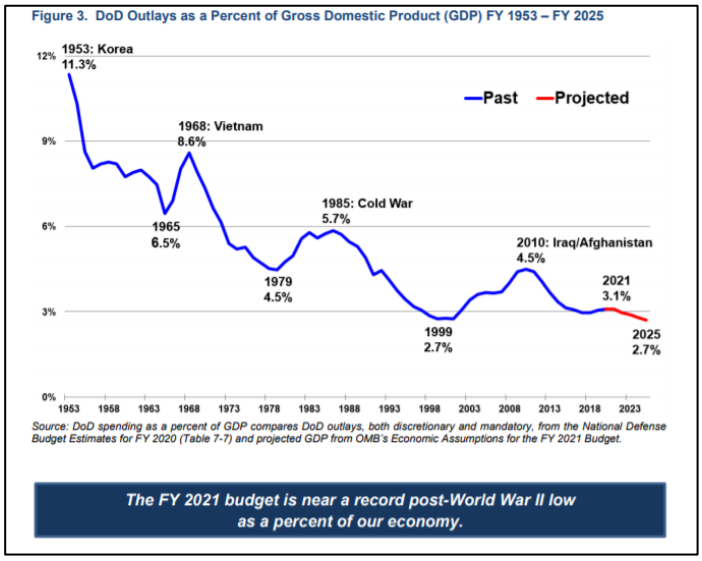


Figure 2. DOD Outlays as % of GDP. Source: DOD Comptroller Budget Overview

Analytic Confidence

The analytic confidence for this estimate is high. The reliability of the sources are high and all tended to corroborate one another. There was adequate time, but the analyst worked alone and did not use a structure method. Changes in future National Defense Strategies and priorities of future Presidential Administrations could impact this analysis.

Author: Vincent A. Amerena Sr.

Essential Element: *Identify Knowledge, Skills, Behaviors, and Preferences (KSB-P)*

Highly probable convergence of Artificial Intelligence and Natural Language Processing in cognitive testing will, by 2025, become the norm when assessing workforce talent's Knowledge, Skills, and Behaviors

Executive Summary

Advancements in AI technology are already in use by industry for evaluation of potential talent. It is *highly probable* that this practice will become the norm by 2025. Furthermore, it is *highly probable* AI will enable timely Knowledge, Skills, and Behaviors (KSB) identification, verification, and upskilling within an organization's existing workforce. Incorporation of Natural Process Language (NPL) will significantly enhance this capability. Increased use of AI will occur despite resistance from HR personnel and human rights proponents on concerns over testing bias.

Discussion

KSBs, also referred to as Knowledge, Skills, and Abilities (KSAs), are a common aspect of the hiring practice throughout the federal government.[H] The Army, with the publication of the People Strategy has begun to "leverage individual's KSBs for the mutual benefit of the Army and the individual."[H] For this practice to be optimally effective, a system will be required to incorporate Artificial Intelligence and Natural Language Processing (NLP).

> "I don't think the young men and women that are coming into the Army want to be managed as interchangeable parts. They want to be managed individually for their talents." – GEN McConville

NLP is a branch of AI that helps computers understand, interpret, and manipulate human language.[H] By aiding in this manner, an organization will be better equipped to assess the KSB/KSAs required of a candidate during a job analysis.[H] Recent developments in deep learning methods, as applied to NLP[H], are significantly expanding NLP's capability to identify human speech (See Figure 1).

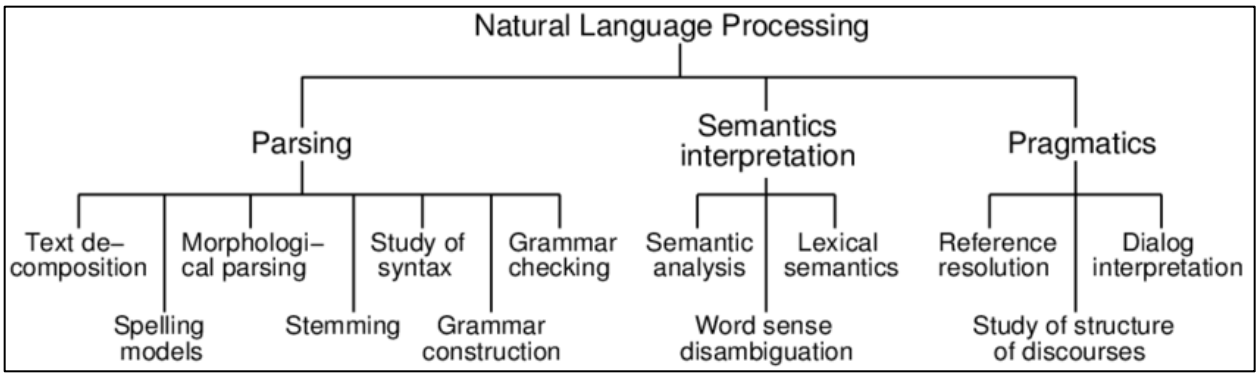


Figure 1: Natural Language Processing. Source: Research Gate

As an AI algorithm uses NLP to perform semantic analysis on a candidate's KSBs it compares those to a job analysis performed on existing or emerging requirement. The output from the NLP model is combined with specific preferential filters such as work location and distance, rate preference vs. job rate proximity, willingness to travel/relocate and resource availability. (See Trip Report – TalentNet). (See Figure 2).

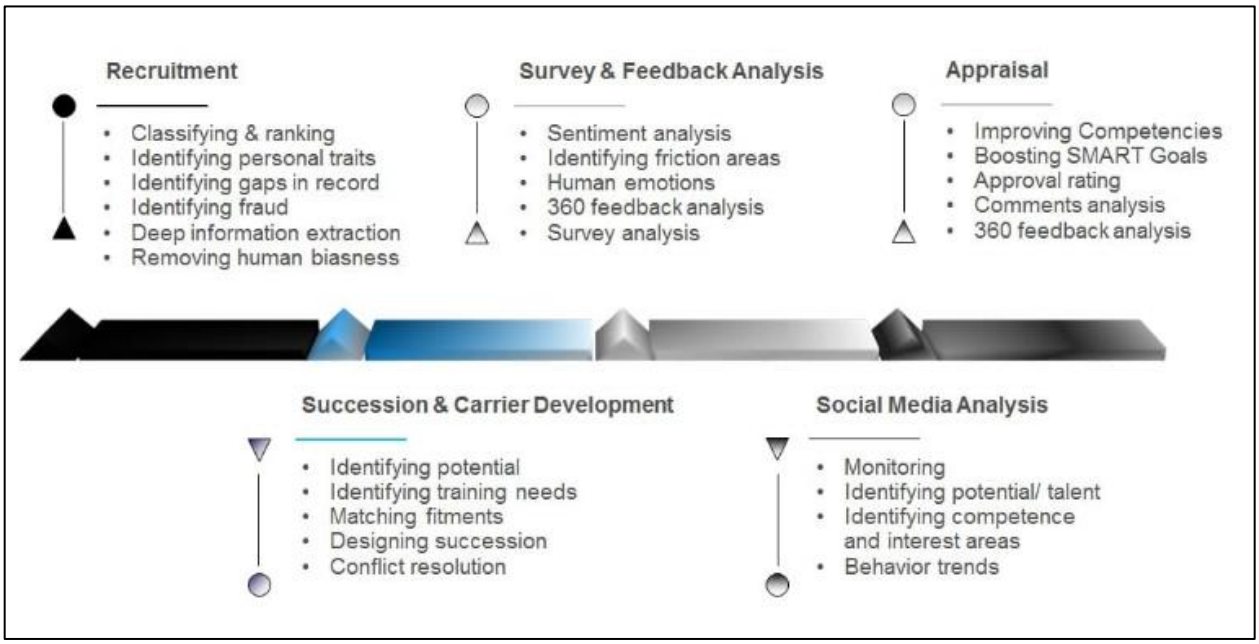


Figure 2: Key application area of Natural Language Process in HR. Source: Analytics in HR

AI application further refine the process as the algorithm 'learns' through its own history of analysis, output, and results. For example, if 'Office Administration' is common 90% of the time on resumes which contain 'filing', the model over time will associate those skills closer in proximity and apply co-dependence. (See Trip Report – TalentNet).

Numerous corporations and start ups across industry are using this technology in their HR practices. This number is expected to grow by over 300% in the next five years. (See Figure 3).

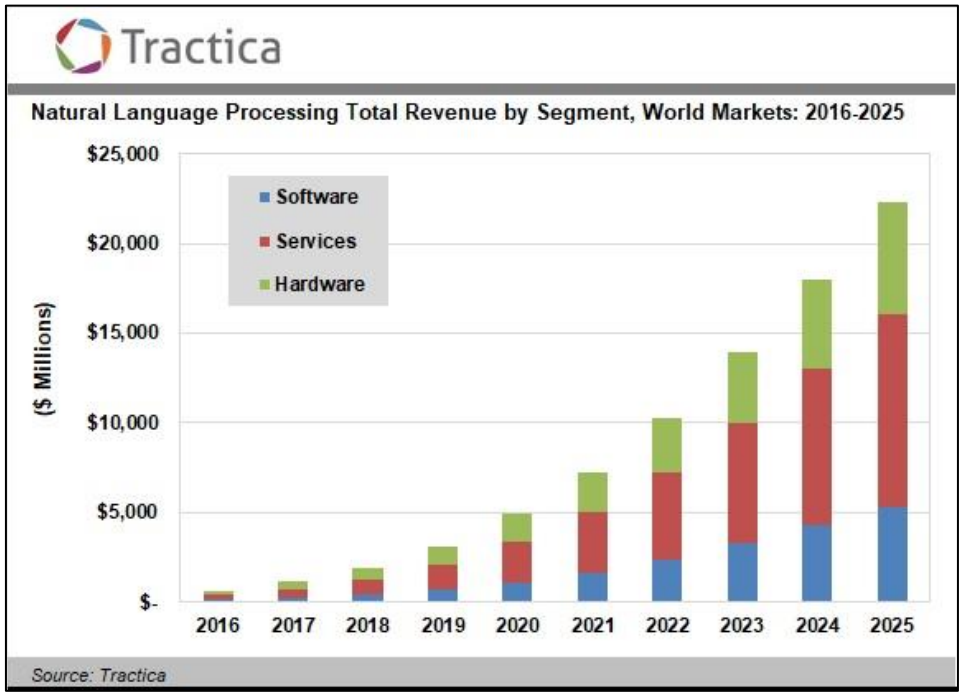


Figure 3: Global software, hardware, and services spending on NLP Estimate. Source: Tractica

The impact of this technology on the Army's ability to identify talent is significant. The capability to use NLP IOT remove limitations of language, jargon, and military specific terminology will allow a more complete view of the available talent pool. Layered with AI, Army talent management will be able to proactively identify qualified personnel for existing and emerging requirements.

This is evolution in HR practices is *highly probable* despite resistance from HR personnel and human rights proponents on concerns over testing bias. For example, Amazon canceled their AI project over concerns that the algorithm, in observing previous hiring patterns, skewed the data to eliminate female applicants.[H] As in current hiring practices,[H] safeguards will have to be put in place to ensure further instances of bias do not occur.

Analytic Confidence

The analytical confidence in this estimate is high. There was adequate time and the task was not overly complex. The reliability of the sources were all medium-to-high. The sources and accompanying analysis all tended to corroborate each other.

Author: Andrew L. Heymann

Essential Element: *Identify Up-Skilling Requirements to Test and Certify for KSB's*

More than 75 million jobs highly likely to be disrupted by automation;50% of workers will need to upskill within next five years in order to meet rapid changes in nature of work

Executive Summary

As emerging technology, automation, robotics, and the use of Artificial Intelligence (AI) shape the character of the workplace, it is *highly likely* that more than 50% of workers will need to upskill to remain agile, relevant, and adaptable in the workforce. These circumstances make it vital that employers create a system of upskilling that converts applicable knowledge into results by identifying those skills that will be most useful in the future. Despite estimates that 46 percent of jobs have at least a 50 percent chance of being lost or greatly changed and 30 percent of young adults will not graduate from secondary school with the skills they need to hold most jobs , today's newly emerging occupations are set to grow from 16% to 27% of the employee base of large firms globally and approximately 133 million new job roles will be created as a result of AI.

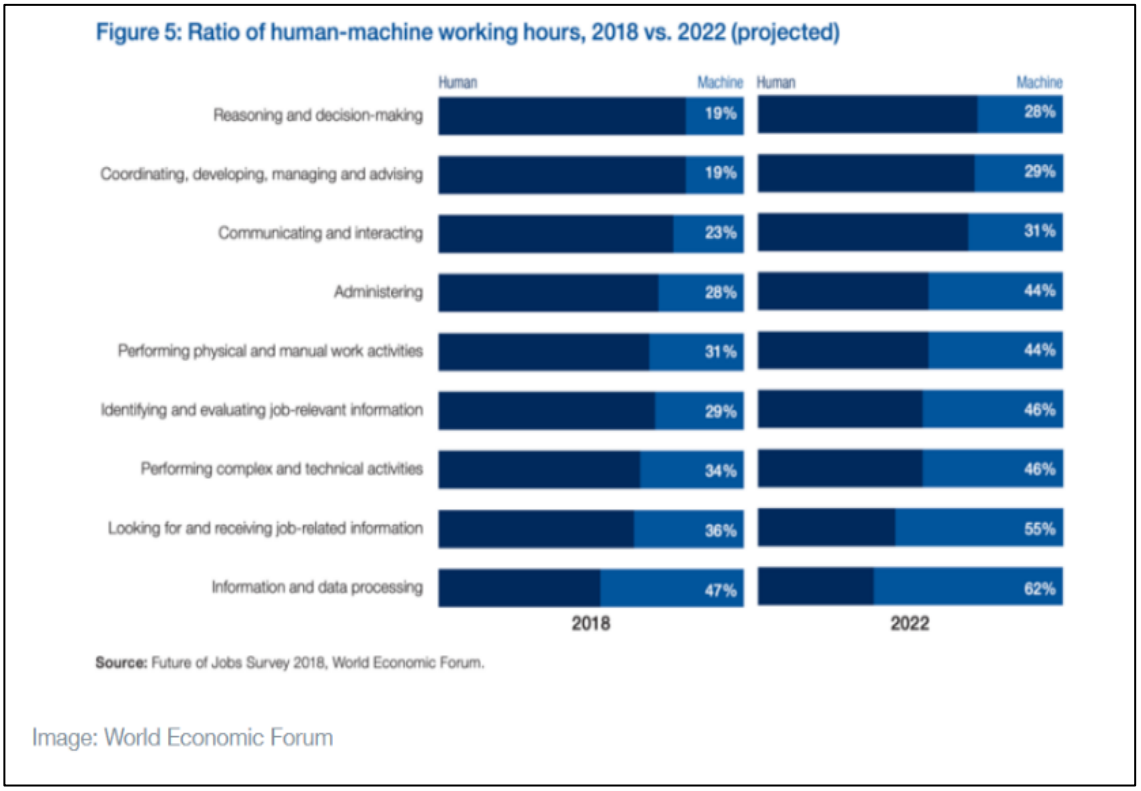


Figure 1: Future of Jobs. Source: The World Economic Forum

Discussion

The workplace is undergoing rapid and dramatic change in the skills and processes it needs due to advances in automation, AI, robotics, and other digital advancements.(See Figure 1). It is *highly likely* that up to 75 million

jobs will be displaced as a result of changes to the division of labor between people and machines, H however, 133 million new roles will be created in those same economies.

These new roles will require a particular set of skills that the current workforce may be lacking. Despite the estimation that 46 percent of all jobs have at least a 50 percent chance of being lost or greatly changed and that 30 percent of young adults will not graduate from secondary school with the skills they need to hold most jobs. H , this gap between the contemporary workforce and the requirements of technology-driven industries can be addressed through upskilling. A strategic upskilling effort involves identifying the skills that will be most valuable in the future, the businesses that will need them, the people who need work and could plausibly gain those skills, and the training and technology-enabled learning that could help them —and then putting all these elements together. H

A survey of CEOs showed that their overwhelming choice of strategies for dealing with the crisis in skills was to invest in the upskilling (See Figure 2) of their current employees. H

Figure 2: CEO Focus on Upskilling
Source: Society of Human Resource Managers

Upskilling is not just a positive for the employee. As the labor market becomes even more competitive, organizations that invest in their employees through upskilling and fitting skills to the right area of productivity will find themselves as employers of choice in the marketplace.

As Generation Z ranks the ability to advance in their job as a high priority, companies that prioritize upskilling see less turnover and the associated costs of onboarding and training a new employee. H The other reality is that new employees with the requisite skills are difficult to find and harder to hire given the extremely competitive job market.

The upskilling process consists of several steps including:

- determining the strategic goals of the program such as a desired retention rate

- an assessment of the current workforce relative to their aptitude to learn the new skills, an analysis of exactly which skills make up the gap and what method of training is most advantageous
- using artificial intelligence and machine learning algorithms to broaden and deepen the talent pool by identifying potential candidates for difficult-to-fill positions who would never otherwise think to join an upskilling initiative. H

Once the upskilling has occurred, the process of matching skills and people to requirements takes place. A key part of that procedure is to adopt a method of certifications and credentialing of employees with their new skills. In some cases, industry recognized certifications are created and made available through recognized organizations that bring consistency and standardization to these credentials. H An example is the IBM digital credential program on Credly's Acclaim platform to increase employee recognition, motivate skill progression and make the IT workforce more inclusive. As of 2018, more than 350,000 individuals have earned a digital credential through the program, and over 1 million digital credentials have been issued. H This innovative system of digital badging allows recognition of skills that don't require a standard four-year degree alternative creating a distributed system for credentialing where you can get recognition for learning of any and all kinds. That recognition is granular, so incremental learning is captured and the learner has a more comprehensive story to tell about her learning experiences. M The process of upskilling certifications through digital badging also allows for the capture of experiential learning and soft skills such as leadership, adaptability, and decision-making that aren't readily apparent in more traditional credentialing platforms.

Analytic Confidence

The analytic confidence for this estimate is high. The reliability of the sources are high and all tended to corroborate one another. There was adequate time, but the analyst worked alone and did not use a structure method.

Author: Vincent A. Amerena Sr.

Essential Element: *Visibility of Total Force Requirements by the Individual*

Generation Z highly likely to drive Army's talent management systems of 2035 with focus on development of Soldier versus Army's needs

Executive Summary

In 2035, Generation Z (Gen Z), those born between 1996-2012, will be the majority generation in the Army. It is *highly likely* Gen Z will drive the future Army talent management system to focus on individual Soldier development versus the Army's needs in order to recruit and retain talent. Despite less emphasis on compensation, Gen Z employees are more interested in employers offering flexibility, learning and development opportunities and the use of digital assistants that will advance their capabilities in the workplace.

Discussion

Although Gen X has embraced the integration of technological advances, the gap between Millennials and Gen Z is significant. Daniel Sanchez Reina, a senior research director at Gartner, said, "Although they are called the 'post-millennial generation', Gen Z'ers have little in common with millennials. CIOs cannot lead them in the same way they lead millennials."[H] While some in prior generations find it intrusive to receive hyper-personalized ads or have a brand know everything about them, Millennials and Gen Z cannot remember a time when that was not the norm. According to Emily He, Oracle's Senior Vice President of the Human Capital Management Cloud Business Group, "the same is true for Gen Z in the workplace--a tailored experience that is focused on their individual goals, work style, and preferences. They expect in the workplace – a tailored experience that is focused on their individual goals, work style, and preferences." [H]

To further the employee centered shift in talent management, in a study from The International Journal of Human Resource Management, authors Wang, Kim, Rafferty and Sanders said a future HR system has to answer the "what" of the content of HR practices through which an employer delivers messages, the "how" recognizes the possibility that the same HR content may lead to divergent outcomes depending on how such practices are framed and received and the "why" looks at the potential discrepancies in the way employees judge the motivations behind their organization's introduction of HR practices. [H]

Research also shows digital assistants linked with workstations and into the HR system bring real-time info and answers that are critical to future employees. According to Ms. He, "Digital assistants can respond to common inquiries instantaneously, satisfying Gen

Z's on-demand expectations while saving valuable HR time to focus on more strategic initiatives. Additionally, with machine learning, digital assistants can apply data from a specific user's profile to form personalized recommendations, delivering more accurate and tailored content with every interaction."[H]

Despite often labelled as self-interested, overconfident, and lacking in the personality, Gen Z has spent much of their childhoods on and influenced by digital. However, according to Dr. Robyn Johns, senior lecturer in human resource management at the University of Technology in Sydney, "Generation Z are good multitaskers and desire constant feedback. They also want clear goals, rewards, and personal challenges to keep them involved in the workplace and their personal lives."[H]

Unlike Millennials and despite having high ambitions for personal growth, Gen Z are not job hoppers — they are role hoppers and natural entrepreneurs. "They favor the idea of developing skills, welcome additional training and are more inclined to build a career at one company, rather than hop from one employer to another," said Mr. Sanchez Reina.[H]

However, analyst Lauren Smith from Gartner Inc, a leading research and analyst company, says "Gen Z actually displays a heightened awareness of their need to constantly upskill to remain relevant in the workforce of the future," Smith said. "They expect almost 40% of the skills they use at work today to expire within three years, surprising, when compared to a mere 30% expiration expectation among millennial and Gen X employees. As a result, Gen Z values learning and development as a key employment attraction driver."[M] Figure 1 is an aspirational video that visualizes a Gen Z a future talent management system.

Figure 1: This video from Deloitte helps visualize what a future talent management could be to acquire and retain Gen Z in the future workforce

Analytic Confidence

The analytic confidence for this estimate is high. The reliability of the sources is high. The sources and accompanied analysis all tended to corroborate each other irrespective of location in the world. There was adequate time and the task was not complex.

Author: Martin D. Lepak

Essential Element: *Interoperable with Information Systems across Army Enterprise*

Interoperability, not compatibility, of Human Resource Information Systems integrated through cloud-based systems highly likely critical by 2035 to meet demands of employers and workforce

Executive Summary

Human resource information systems (HRIS) will *highly likely* need to become increasingly interoperable, not compatible, in integrating talent management, human resource management services (HRMS), and payroll support as they compete for talent in an open market. Generation Z, who will be the majority of the workforce in 2035, are digital natives and will seek a "single source of truth" in their organizations HRIS. The availability to access HRIS via mobile-friendly and cloud-based systems are *highly likely* to be the industry standard despite the security and access challenges associated with protecting personally identifiable information (PII) in online information systems.

Discussion

Interoperability is the ability of different information systems, devices, and applications to access, exchange, integrate, and cooperatively use data in a coordinated manner, within and across organizational, regional, and national boundaries in providing timely and seamless portability of information.[H] Whereas compatibility is when two or more different information systems, devices, and applications operate in the same environment without interfering with other operations.[M] The distinction between the two is extremely valuable when developing and deploying HRIS that meet the demands of talent and employers.

In previous analysis on Generation Z (See Millennials and Gen Z)it described the cultural shifts within the workforce of 2035. Furthermore, Generation Z will make decisions on where to work based on use of technology within the company and believe that automation and technology will make a more equitable workplace environment (See Figure 1), which is important to Gen Z'ers.[M] Interoperable, cloud-based HRIS, that are the "single source of truth" (one system interface that is interoperable across multiple separate systems) will minimizes the costs of errors and facilitates seamless processes across the organization, saving the organization and employee time and money.[M]

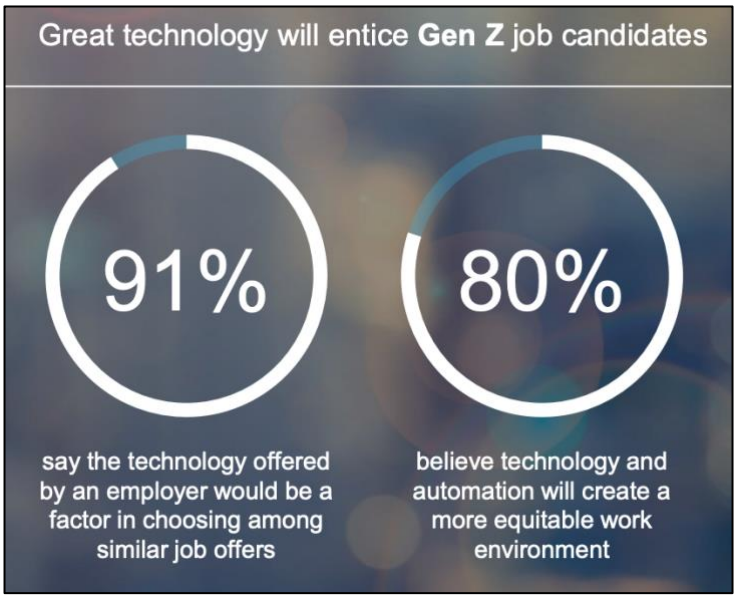


Figure 1: Generation Z – Digital Natives
Source: Dell Technologies

Integrated cloud-based HRIS, similar to those used by the Department of the Interior[H], can provide the Army with a hybrid of application networks that meets the demands of the talent after next. Interoperable HRIS that integrate cloud-based application and data storage help large organizations in breaking down the information silos and becoming a "single source of truth" improving data accuracy and ensuring interoperability across platforms. Improved accuracy is valuable in making talent decisions, aligning processes across the organization, and providing world-wide access to critical HR information.[M]

Interoperable and integrated HRIS are crucial in marrying critical employee personnel information such as recruiting, training, evaluations, and other information with other aspects of their HR records such as salary, payroll, and other benefit-related information (See Figure 2). These interoperable and integrated HRIS provide managers with the specific attributes across the organization's personnel management systems. The system provides an integrated solution to meeting HR functions into a "single source of truth" system.[M] Current HRIS often lack the "single source of truth" for managers and talent required in making HR decisions across the organization.

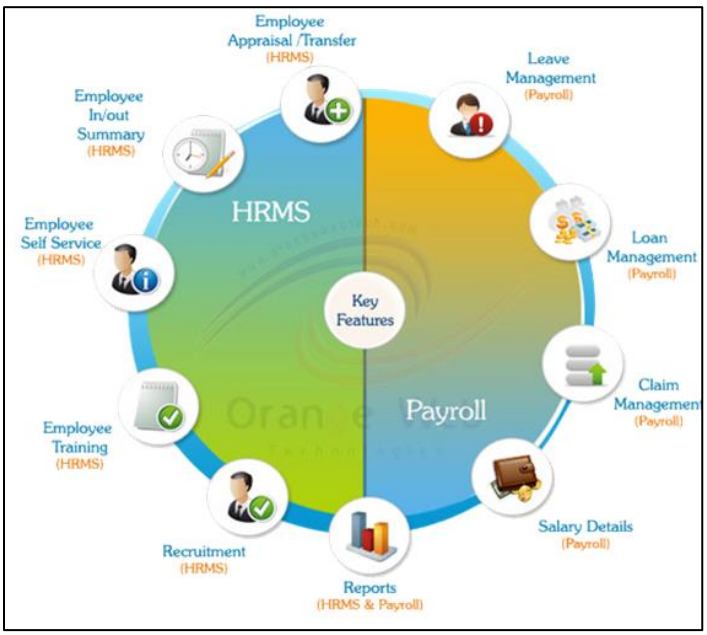


Figure 2. Human Resource Information System Work
Source: HR Daily

The HR field is *likely* to model their services after the healthcare industry in its use of cloud-based and interoperable systems to track and manage patient information. In Mexico, using a single patient record associated with an electronic birth certificate has led to interoperability of medical records for newborns across public and federal organizations. These single-patient records encompass the medical system of clinics, insurers, public hospitals, private hospitals, etc. to manage the newborn's illnesses, vaccinations, accidents, hospitalization, surgery, treatments, allergies and everything related to their health throughout their lives.[M] These improvements in data accuracy leads to better and faster execution of health services.

Cloud-based solutions provide some distinct advantages to centralized, in-house, software or hardware solution. Cost are normally lower with cloud-based vs. in-house servers, databases, and software. Maintenance associated with updating equipment and services is the cloud-serving company's responsibility for the cloud-based systems vs. Cost to the organization using the service. Access to cloud-based information is generally better, more up-to-date, and accurate in providing the information for those who work remotely. [M]

There is a data security risks associated with cloud-based systems (See Secure System Analysis). Many companies and the DOD have experienced data breaches and hacks, the latest incident for the DOD just this year.[H] Despite the challenges associated with data

security, cloud-based solutions provide protection from hardware failures in preventing data loss through multiple redundancies built into the data centers.[M]

As current Army HR systems transition to IPPS-A across all three components using Oracle's PeopleSoft® software over the coming years it is critical to maintain the funding for IPPS-A. Interoperability with other HR systems must be maintained to ensure IPPS-A meets current and future talent management requirements. Interoperable, not just compatible, of Army HRIS is critical in the acquisition, development, employment, and retention of talent across all components while also integrating DAC, Family Members, and select retirees to the Army's talent management system

Analytic Confidence

The analytic confidence for this estimate is moderate. The reliability of the sources is moderate to high and all tended to corroborate one another with some dissenting opinions in terms of strategy for implementation of HRIM systems. There was adequate time, but the analyst worked alone and did not use a structured method. The estimates contained within the sources are good, but given the length of time frame of the estimate, this report is sensitive to changes in technological conditions associated with cloud data security and storage.

Author: Steven M. Clark

Essential Element: *Collaborate with Industry for Talent Acquisition*

Current legacy hiring systems highly likely replaced by 2025 due to advancements in technology, artificial intelligence, and increasingly tight labor market

Executive Summary

Due to advancements in technology, including artificial intelligence, and an increasingly tight labor market, current legacy hiring systems, built around resumes and in-person interviews, are *highly likely* to be inadequate by 2025. The continued increased utilization of online resources for job searches, networking opportunities, and recruitment efforts will highly *likely* drive increased innovation in that sector. Increased competition for qualified candidates due to skilled worker shortages in many sectors is driving the use of artificial intelligence (AI) and online recruiting tools. AI is currently in use to identify best matches and sort through potential candidates. These innovations are *highly likely* to undermine current platforms due to operational inefficiencies coupled with long hiring timelines.

Discussion

Comfort with online platforms is driving the next stage of recruiting integration, using AI to assess and score candidates. (See Figure 1). The majority of major companies, from Allstate to Hylton to Humana are using AI to screen candidates.[H] For example, Unilever recently incorporated AI into it's application process allowing a streamlining effort that scored and sorted applicants that are then quickly pushed forward for a traditional interview. [H]

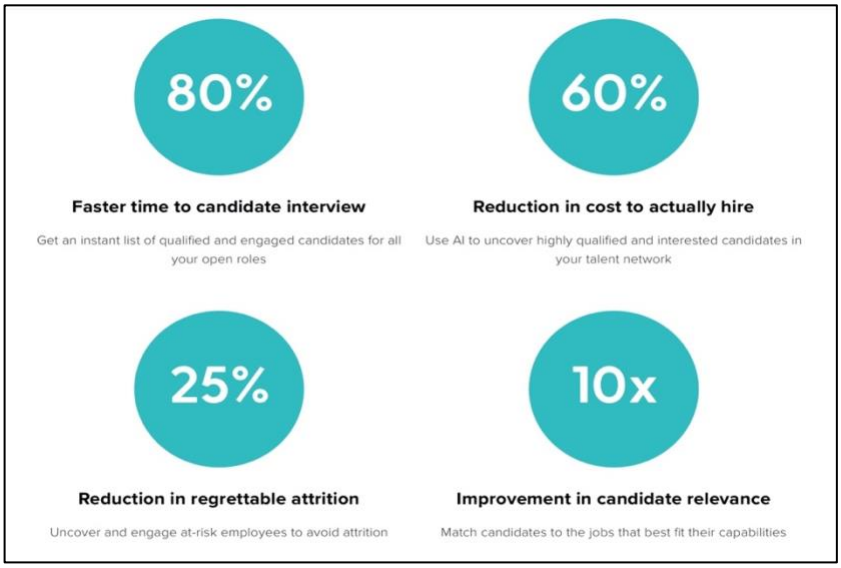


Figure 1: Example of an AI Company Claim of Effectiveness. Source: eightfold

Humana, AT&T and other large companies are combining a variety of technologies such as text messaging, video interviews, and phone interviews in order to quickly and efficiently wade through prospective employees. While almost all companies have some type of face to face interview, the impact of technology is

enabling these firms to be more responsive and reactive to opportunity. [H]

Social networking sites are continuing to grow in reach and effectiveness for online recruiting.[M] Reliance on a job portal that a candidate has to go to and search limits a companies reach and impact. Over the next decade the industry expects more of a shift to social media and mobile platforms for job searches, recruitment efforts, and information sharing.[M] Additionally, utilizing multiple social media sites allow an organization to target multiple talent levels simultaneously, something that is a growing industry trend.[M]

As companies further push platforms for talent acquisition, evidence is coming to show the need for a hub that incorporates all data needs coupled with greater engagement and connectivity. It remains vital to offer information "in a manner which allows job-seekers to rapidly locate what they are looking for, easily understand requirements, and search & apply for the jobs/roles posted."[H]

Multiple studies show consistent trends in hiring shortfalls that all point back to inefficient hiring practices. Found in the top five concerns of both hiring managers and candidates are that of slow and inefficient processes.[M] These inefficiencies result in candidates pursuing different employment opportunities instead of waiting for a company to follow up.[H] As AI improves and organizations can more effectively use analytics and screen candidates, hiring times will further reduce, allowing a company to secure talent more quickly.

While AI and social network platforms will continue to shape recruitment and retention efforts, the human element will continue to be a critical piece of the hiring process. This highlights the continued need to ensure all organizations have talented human resource professionals capable of making swift decisions on hiring actions in order to secure talent in a timely manner.[H]

Analytic Confidence

The analytic confidence for this estimate is moderate. The reliability of the sources are moderate to high and all tended to corroborate one another. There was adequate time, but the analyst worked alone and did not use a structure method.

Author: John A. Urciuoli

Essential Element: *Use of Natural Language Process Search Capabilities*

Highly probable Industry's use of Natural Language Processing (NLP) will increase by over 300% in next 5-7 years

Executive Summary

Advancements in Natural Process Language (NPL) technology are already in use by industry. It is *highly probable* that this practice will continue to increase and will grow by 300% in the next 5-7 years. Incorporation of Natural Process Language (NPL) will significantly enhance this capability. Increased use of AI will *likely* occur despite resistance from HR personnel and human rights proponents on concerns over testing bias.

Discussion

NLP is a branch of Artificial Intelligence (AI) that helps computers understand, interpret, and manipulate human language.[H] By aiding in this manner, an organization will be better equipped to perform across a range of applications.[H] One such example is IBM's "Project Debater" which is billed as the AI system capable of debating humans.[H] Applications such as this could lead to advancements in decision support tools.[H] Numerous corporations and startups across industry in every region are using this technology in their HR practices. This number is expected to grow by over 300% in the next five years. (See Figure 1 and Figure 2)

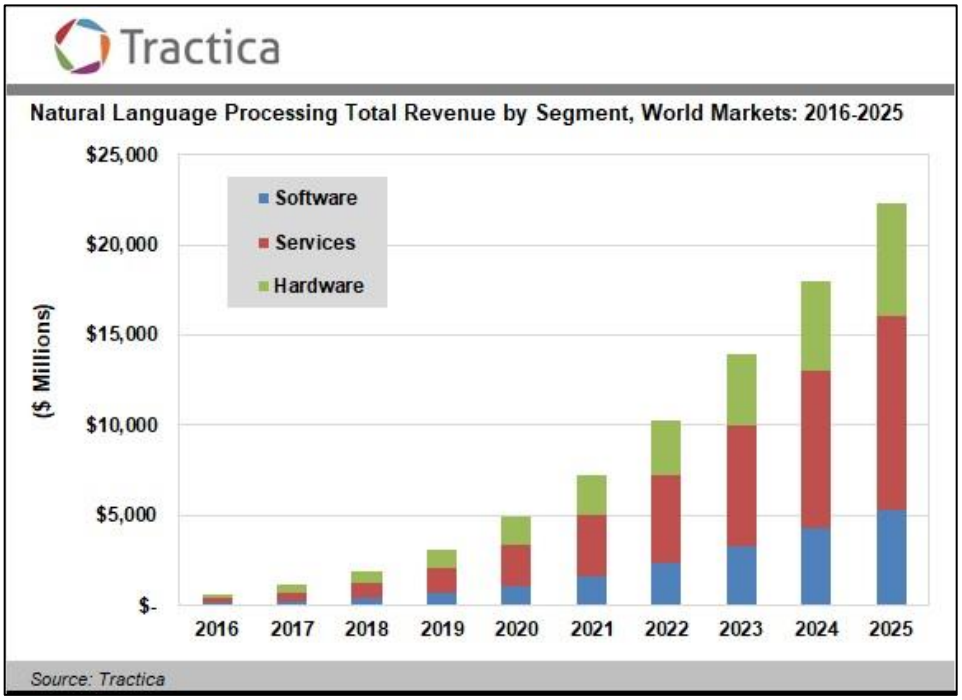


Figure 1: Global software, hardware, and services spending on NLP Estimate
Source: Tractica

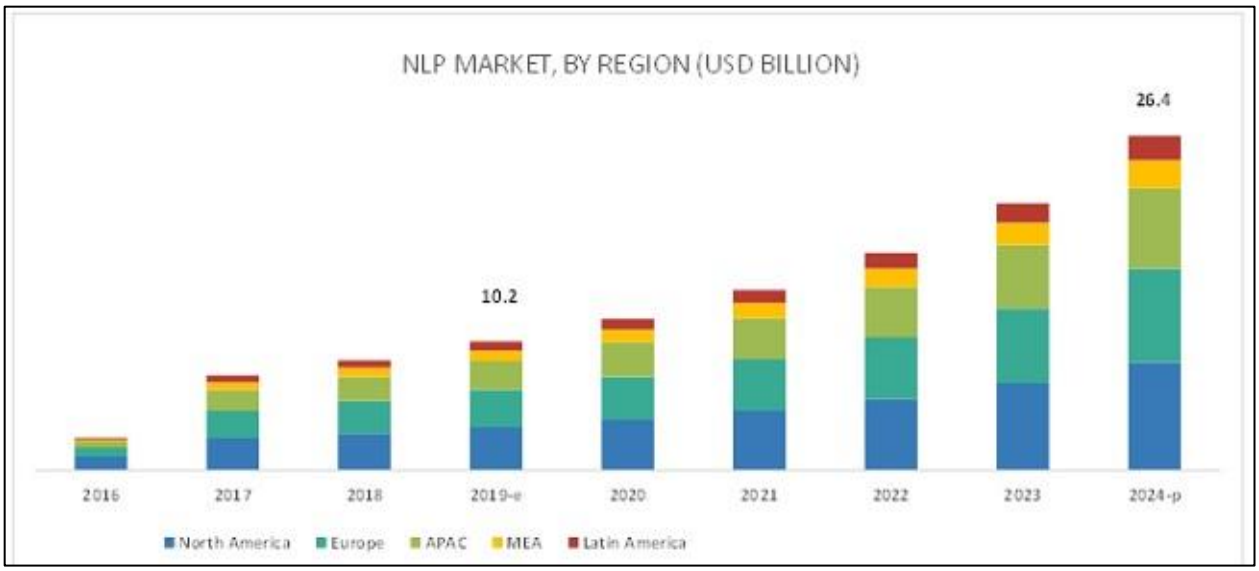


Figure 2: NLP market growth by region, 2016-2024. Source: Markets and Markets

Recent developments in deep learning methods, as applied to NLP[H], are significantly expanding NLP's capability to identify human speech. (See Figure 3).

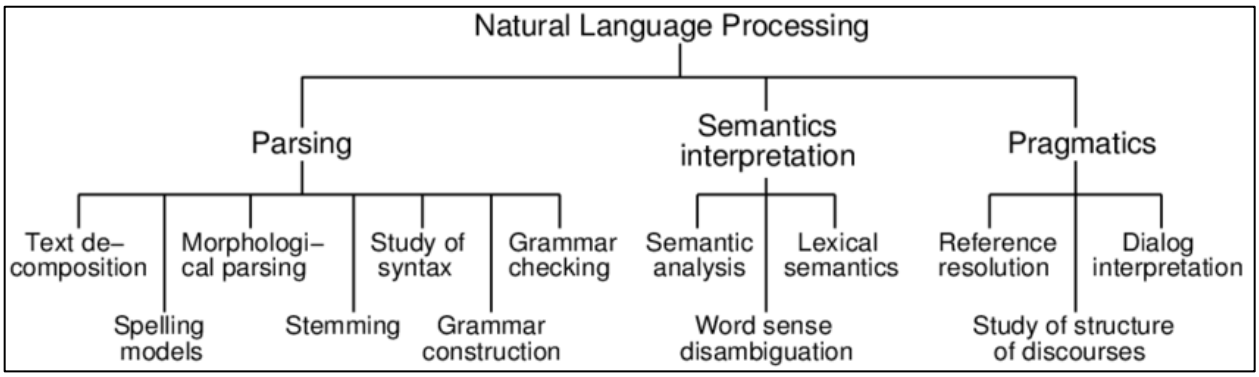


Figure 3: The taxonomy of natural language processing. Source: ***Research Gate***

As an AI algorithm uses NLP to perform semantic analysis on a candidate's KSBs it compares those to a job analysis performed on existing or emerging requirement. The output from the NLP model is combined with specific preferential filters such as work location and distance, rate preference vs. job rate proximity, willingness to travel/relocate and resource availability. (See Trip Report – TalentNet). (See Figure 2)

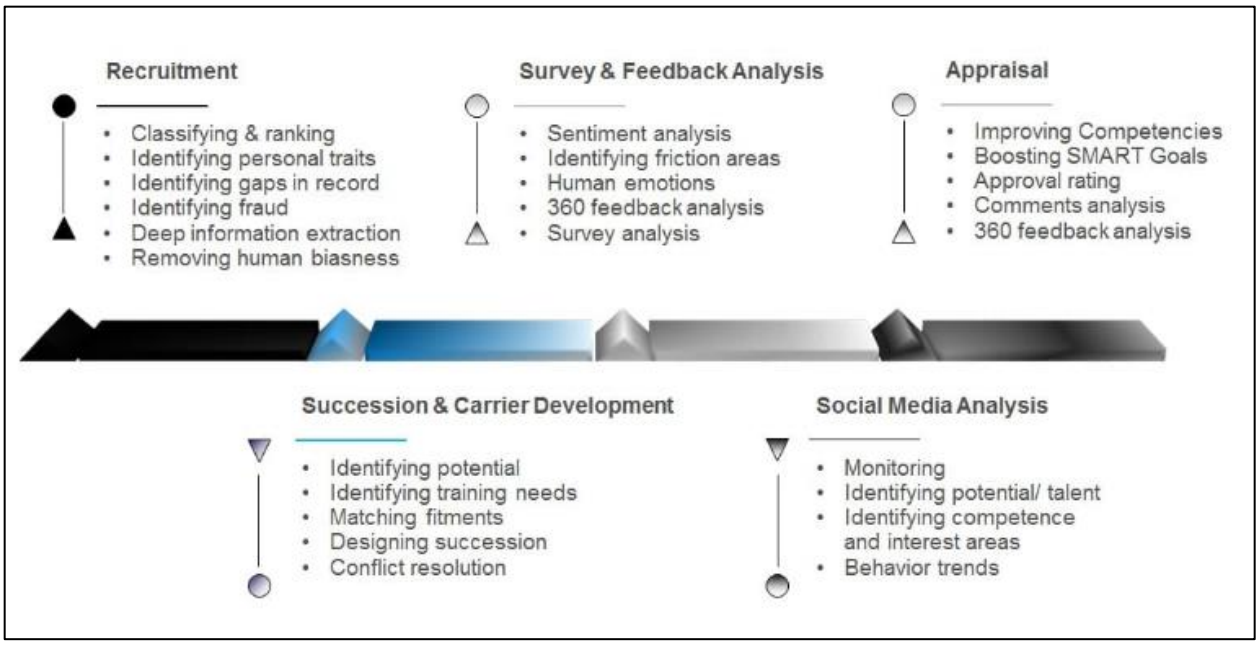


Figure 4: Key application area of Natural Language Process in HR. Source: Analytics in HR

AI application further refine the process as the algorithm 'learns' through its own history of analysis, output, and results. For example, if 'Office Administration' is common 90% of the time on resumes which contain 'filing', the model over time will associate those skills closer in proximity and apply co-dependence.

This growth will occur despite concern that an over reliance upon NLP could lead to "false positive" diagnoses. This is especially true in the medical profession.[H]

Analytic Confidence

The analytical confidence in this estimate is high. There was adequate time and the task was not overly complex. The reliability of the sources were all medium-to-high. The sources and accompanying analysis all tended to corroborate each other.

Author: Andrew L. Heymann

Essential Element: *Appropriate Access to the System*

Distributed ledger technology likely to balance system security with access requirements

Executive Summary

Remote and controlled access to system information, based on individual's roles and responsibilities, is *likely* replaced by distributed ledger technology (DLT), also known as blockchain, in the next 10-years. Appropriate access to information will be controlled by one's position and authorities using technologies associated with credentialed information tied to one's duties. Blockchain and distributed ledger technologies are *likely* to balance security risks associated by the storage of sensitive data online despite the scalability and cost of DLT.

Discussion

Blockchain, a form of DLT, creates a single source of truth system (SSoTSs)"[M] in its distributed method of storing and sharing of human resource (HR) records. In terms of HR departments, from recruiters to senior leadership, it will provide the distributed and controlled access required for the recruiting process, help with accessing talent management information, running background checks, verifying employment history, engaging contracted personnel, maintaining HR records and employees' personal data, etc.[M] Blockchain solves the problem associated with HR data stored in multiple locations and on multiple systems (See Figure 1). Blockchain eliminates the multitude of 3rd party integrations required for normal business operation.[M]

Figure 1: Blockchain Technology in HR. Source: MBA

Emerging technologies, matched with pervasiveness of personnel data are increasing the reliability, visibility, transparency, access, and information sharing across company

boundaries—enabling smarter, more informed decisions and greatly improved operating efficiency.[H]

The following are ways distributed ledger technology, also known as blockchain, can improve HR functions:

- Make it easy to prove identity allowing for independent verification of individuals and can be used to control access to HR information.[H]
- Validate qualifications. With the blockchain technologies, institutions have an easy and less costly way to publish the certificate they issue online. More importantly, third party entities like the government can vouch for the authenticity of the documents.[M]
- Improve privacy and security of personal data. Distributed ledger technology provides more control, privacy and security for data. Once recorded, data becomes immutable.[H]

Across many platforms, blockchain has shown to bring excellent results in boosting operational efficiency and secure data across many industries. For example, in logistics, Maersk uses it to track international cargo, Walmart uses it to track supplies across the supply chain, and Massachusetts Institute of Technology uses blockchain in securing data and has defined itself as 'a permanent and tamper-proof infrastructure of trust.'[M]

There are challenges associated with DLT based on its limited practical application within current HRIM. The scalability, cost, and slow transaction speeds may reduce the near-term application.[M]

Analytic Confidence

The analytic confidence for this estimate is moderate. The reliability of the sources is moderate to high and all tended to corroborate one another with some dissenting opinions. There was adequate time, but the analyst worked alone and did not use a structured method. The estimates contained within the sources are good, but given the length of time frame of the estimate, this report is sensitive to changes in technological conditions associated with emerging technologies.

Author: Steven M. Clark

Essential Element: *Push Notifications, Both to the Army and to the Individual's*

Highly probable incorporating technological innovations in mobile apps, notification processes vital for competitive advantage

Executive Summary

Advancements in mobile application technology are accelerating with the inclusion of Artificial Intelligence, 5G, and Beacon Technology Process. It is *highly probable* that due to these developments, organizations' ability to leverage mobile apps and data notification will need to incorporate technological advancements to maintaining a competitive advantage. This will occur despite the most current data showing that 42% of website visits occurred from desktop computers.

Discussion

Advancements in mobile application technology are accelerating with the inclusion of Artificial Intelligence, 5G, and Beacon Technology Process.[H] Push notifications are one area that will benefit greatly from these innovations. Three types of platforms are in use for push notifications:[H]

- Entry-level web apps – These provide a basic toolkit for sending push notifications.
- Sophisticated management tools – Higher-level management solutions build on the feature-kit offered by entry-level apps and usually include in-depth analytics, AI-driven personalization, and segmentation.
- Monetization platforms – Advertising networks enable brands to reach new audiences via push notifications from third-party apps and sites.

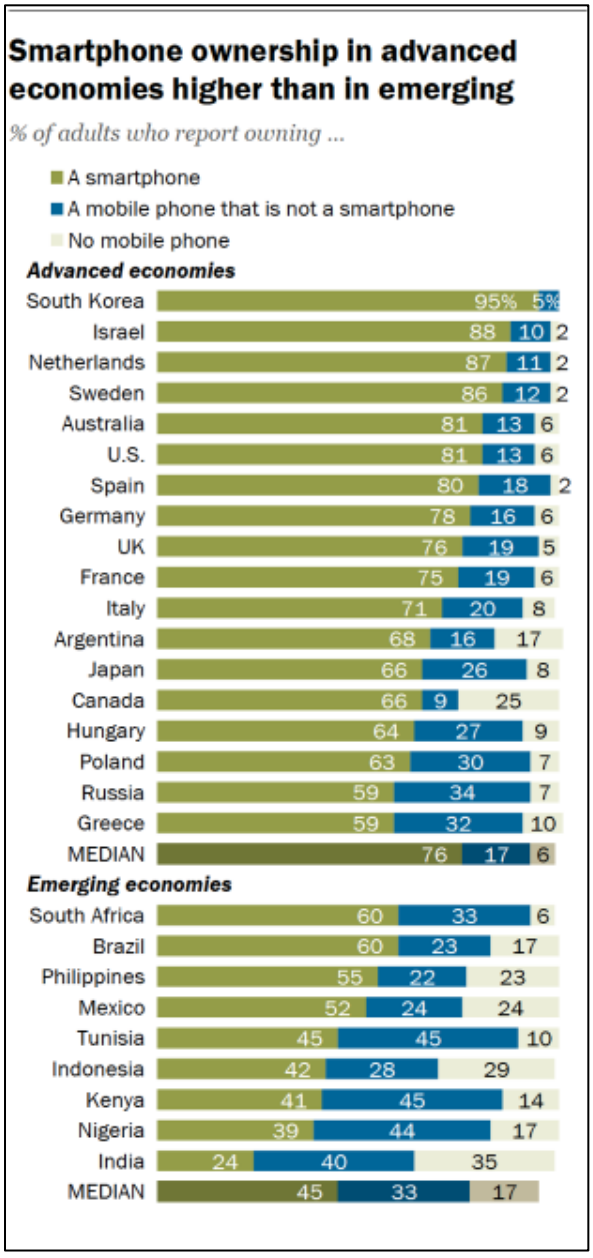


Figure 1: Percent of smartphone ownership. Source: Pew Research

A 2018 PEW Research Center study showed the global popularity of smartphones. (See Figure 1). A 2017 study concluded that mobile consumers were on their devices 2x more than desktops (See Figure 2).

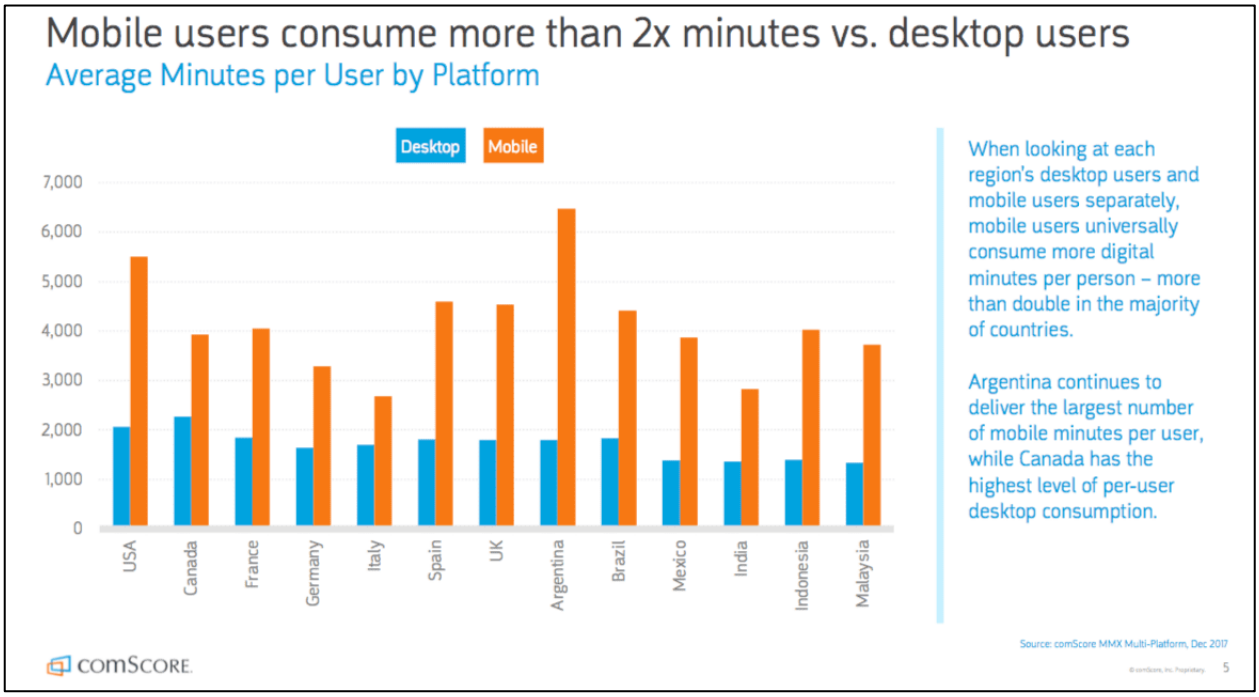


Figure 2: Mobile vs. Desktop usage; average use by platform. Smart Insights

With the ubiquitous ownership and usage of smartphones, Average US users receive 46 app push notifications/day with 40% of those being from the ecommerce or media, publishing & blogging sectors. (See Figure 3).

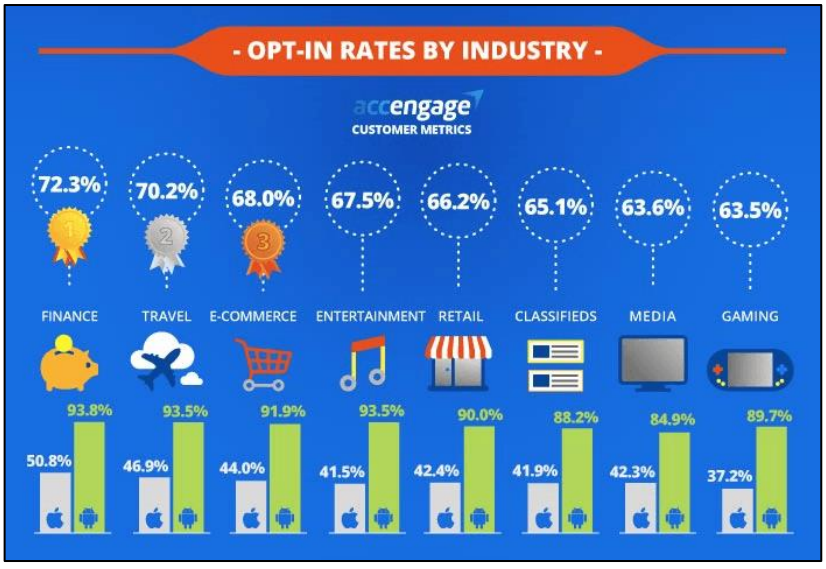


Figure 3: Opt in rates by industry. Source: Accengage

AI can aid organizations in targeting push notification recipients and in personalizing messaging.[H] For beacon-powered mobile apps, whenever an enabled device enters the beacon's zone, that app catches the signal and accordingly shows the device owners fitting notifications.[M] Globally renowned companies like Samsung and Verizon are already working to bring 5G-capable chips in the market. 5G will allow sensors to be built into appliances, security systems, health monitors, door locks, cars

and wearables from smartwatches to dog collars.[H] A report by Strategy Analyst predicts that the number of connected devices will reach 50 billion by 2030 (See Figure 4).

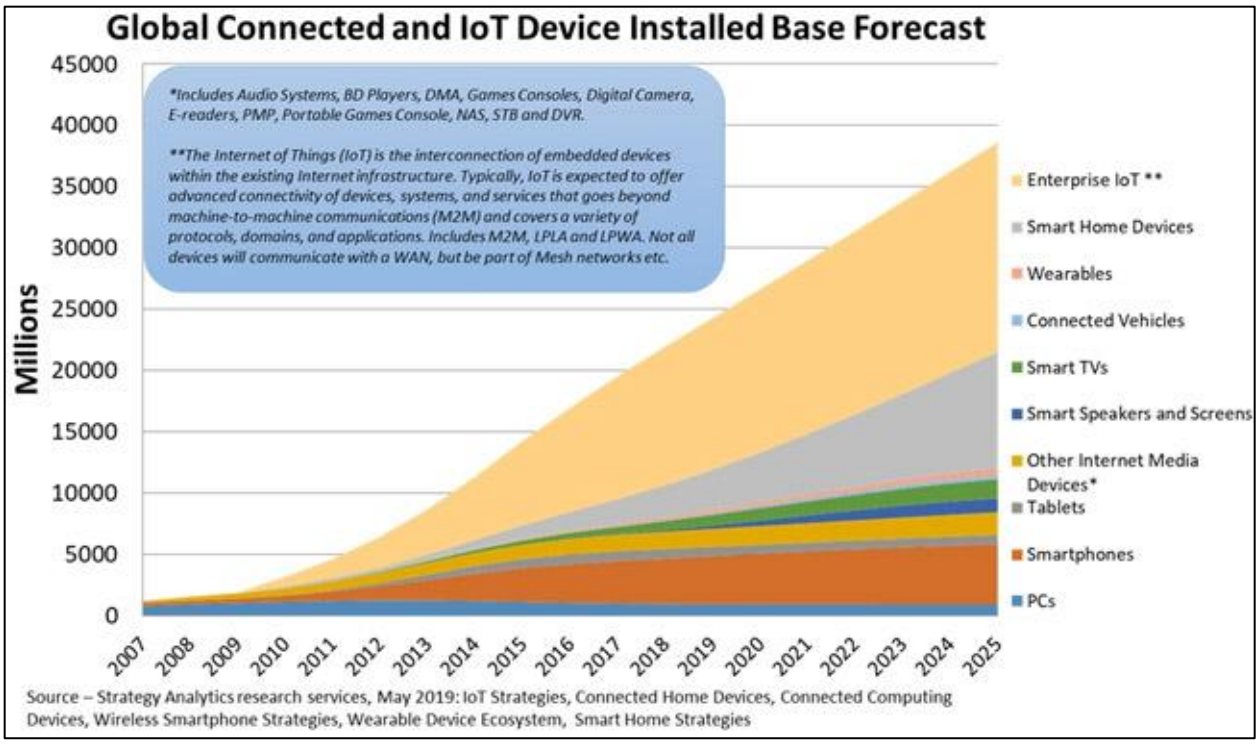


Figure 4: Forecast for growth of globally connected devices. Source: HelpNet Security

Incorporating emerging technologies will enable an organization to optimize notification opt-in rates. The literature agrees that factors such as the timing, language, frequency, visual attractiveness, and personalization of push notifications increase effectiveness and opt-in rates.[HMM]

The increase incorporation of emerging technology for smartphone push notification will occur despite the 2019 data showing that 42% of website visits occurred from desktop computers; a slight increase from 2018.[H] 96% of the US population ages 18-29, the target demographic for the Army of 2035, owned smartphones.[H] This makes it essential that push notifications to mobile devices incorporate emerging technologies.

Analytic Confidence

The analytical confidence in this estimate is high. There was adequate time and the task was not overly complex. The reliability of the sources were all medium-to-high. The sources and accompanying analysis all tended to corroborate each other.

Author: Andrew L. Heymann

Essential Element: *Secure System*

Despite widespread acknowledgement of the importance of safe and secure systems, need for secure but accessible talent management system highly probable to success of talent management and recruitment

Executive Summary

It is *highly probable* that talent management systems of the future must incorporate network security with access ability for the end user on mobile platforms. This will drive increased tension across the network as corporations attempt to protect themselves while also attempting to recruit and retain talent. Recent reports highlighted that 95% of breached records typically come from three industries – government, retail, and technology. The government is targeted not necessarily due to vulnerability, but due to the high volume of personally identifiable information it possesses. With cyber-attacks coming every 39 seconds, costs of a data breach at $150 million each, and half billion personal records stolen in 2018 alone, the need for a secure system has never been stronger.

Discussion

Secure systems of the future require added complexity and will *likely* rely on artificial intelligence (AI) in order to monitor and identify threats across the network. (See Figure 1) As the number of devices connected to a network grows, the ability of any IT system to monitor and analyze for threats becomes increasingly complex. Maintaining a safe and secure network involves gathering, organizing, and cross-checking data from every device that connects to it.[H]

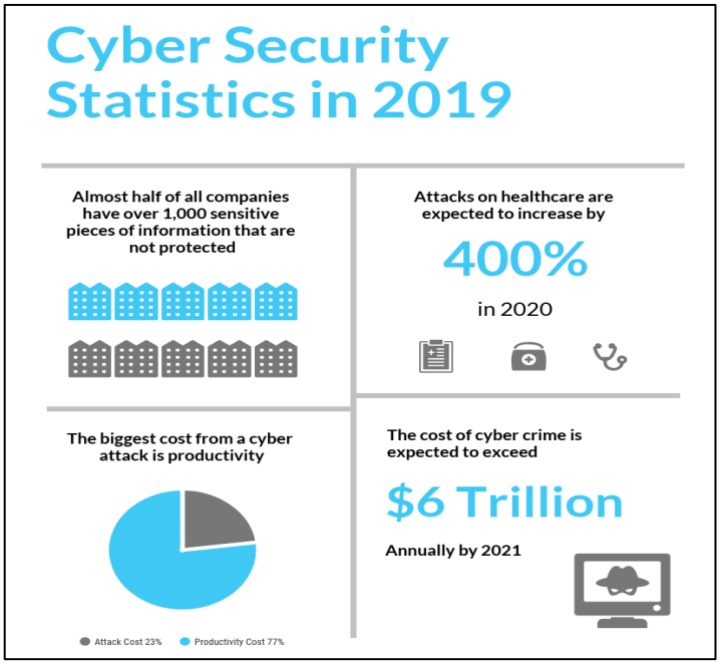


Figure 1: Cyber Security Trends. Source: Reliable Inc

Network security is an inherit tension as the need to secure the network conflicts constantly with the ability to build value. The fundamental strategies to network security have been to limit access to resources and to minimize network connectivity.[M]

These are contrary to development of value in networks. Typically, the more people or devices that can access the resource, the greater the value of the resource.

Metcalfe's Law asserts that the value of a telecommunications network is proportional to the square of the connected users of the system which highlights the exponential capability of any system.M Consequently, the more people and devices a network connects, the greater the value of the network.M

Technological barriers, personal motivation, and business case analysis has limited large scale efforts at network security. As technological advances continue into the next decade, those barriers will erode, allowing for increasingly complex network security.M Personal motivation in the past has limited constraints placed upon individuals to drive security; however, recent ransomware attacks have highlighted the need for improved measures even if that means decreased convenience.M Finally, the business case analysis, which previously may have shown security to be not worth the investment, will erode as costs of emerging technologies decrease along with societal changes. Most recently, COVID-19 pandemic has highlighted the need to conduct effective telework while maintaining a secure network.H These changes in business operations will allow the organizations invested in security to continue to operate at the highest level during the greatest times of challenge.

As the Army enters an ever-tightening market for talent, the need for a responsive, accessible talent management interface is *highly probable* for success.H Current Army systems restrict access and have no real mobile phone interface capability while limiting mobile access to Common Access Cards due to security protocols.

As companies further push platforms for talent acquisition, evidence is coming to show the need for a hub that incorporates all data needs coupled with greater engagement and connectivity. It remains vital to offer information "in a manner which allows job-seekers to rapidly locate what they are looking for, easily understand requirements, and search & apply for the jobs/roles posted,"H which is currently a key Army capability shortfall.

Analytic Confidence

The analytic confidence for this estimate is high. There was adequate time and the topic was not particularly complex. The reliability of the sources available on this topic were medium to high. The sources corroborated each other and collaboration between sources were strong.

Author: John A. Urciuoli

Process Visualization

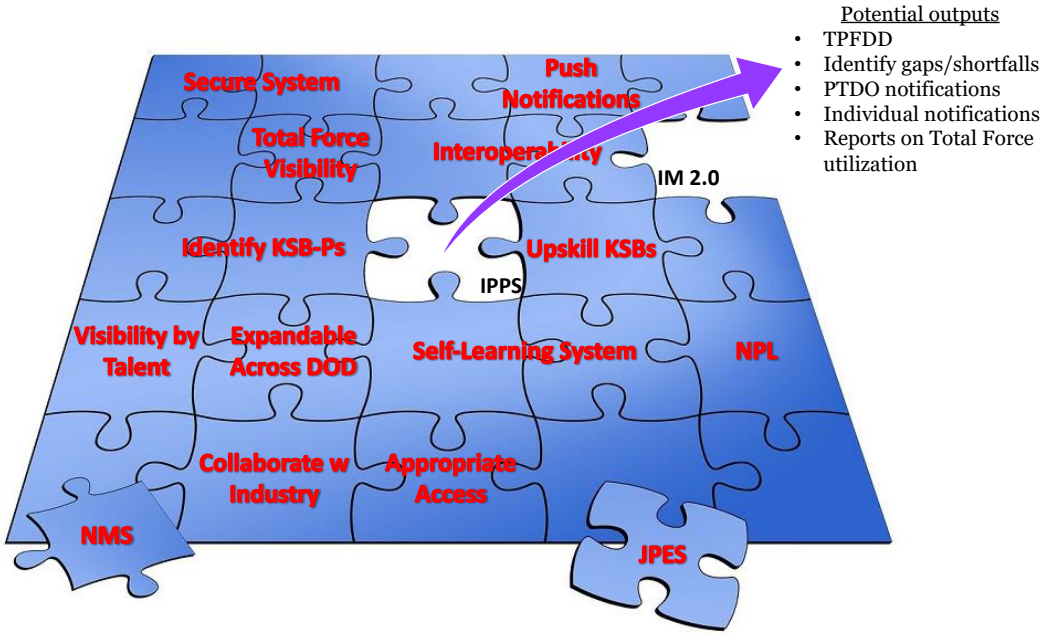


Figure 1: A graphic representation of the Talent Management After Next (TMAN).

Every essential element identified fits together to create a future **Self-Learning** and **Secure System** capable of the agility and adaptability necessary to meet Army requirements in real-time. As the Army evolves from the current system, the Talent Management After Next (TMAN) which is enabled by **Interoperability with other Systems** will provide a holistic view of the available workforce to include **Total Force Visibility**, **DOD Expansion**, and **Collaboration with Industry.**

Natural Process Language (NPL) allows for a more complete **Identification of knowledge, skills, behaviors, and preferences (KSB-Ps)** and provides a means for **Upskilling KSBs.**

The result is a comprehensive identification of requirements which is **Visible by Talent**. With **Appropriate Access to the System**, organizations use **Push Notifications** to alert talent to the requirement and the acquisition process can begin.

Integration with strategic guidance parameters (NSS, NMS, CCPs, etc.), policy, and planning architecture (JOPES, JPES, etc.) provides the potential for TMAN to significantly aid in operational planning.

One potential future application is as the DOD identifies an emerging AOR, TMAN is used to assess the situation and produce a TPFDD based upon AI and ML enhanced findings. For example, TMAN is capable of mining social media, news reporting, and other open-source resources to provide detailed analysis and a recommended MTOE. Comparing current MTOEs against the AOR analysis, TMAN identifies gaps in manning and tabulates a list of qualified candidates based upon military and civilian KSBs.

Definitions of the Impediments

The 13 impediments of a talent-based approach to Army personnel management system are listed below. Our research identified 5 impediments, in addition to the 8 "Enduring obstacles to change" as identified in the Talent Management Concept of Operations for Force 2025 and Beyond. Those 8 are marked with an "*".

Mobile Access to Talent Marketplace: The ability of current and prospective employees to access the talent marketplace for a variety of purposes impacts recruitment, marketing, and effectiveness of the force. Research shows the industry trends toward mobile access to streamline talent management to meet both industry and talent requirements.

Stability: Reduction to fluctuations in changing circumstances; financial, emotional physical, and interpersonal stability are means of achieving balance. Predictable operational tempo (OPTEMPO) provides stability to an individual and their family.

Army Civilian Hiring Practices: The current civilian hiring process is not sufficiently agile to meet current and emerging Army requirements or compete with corporate hiring practices. This includes its effect on spousal employment; an issue identified in the 2019 Blue Star Survey.

Military Compensation: In highly competitive fields pay lags the corporate sector for skills in high demand. While bonuses and incentives can offset a portion of compensation, the continued perception of degradation of military benefits (retirement and medical) will *likely* serve as an increased barrier.

Physical Requirements: The physical standards and requirements of the Army are *likely* to limit the appeal to the general public over time. Additionally, requirements of physical standards will continue to limit the eligible population as demographics change over time.

Culture*: The Army is an institution whose roots of tradition run deep. Changes that affect promotions, pay, assignments, leadership succession, and evaluations impact the careers of everyone and have significant implications for organizational culture. Furthermore, the department generally views talent management capabilities as a cost in a resource-constrained environment instead of an investment in human capital necessary to sustain a smaller Army.

Immediate Needs of the Army*: The demand to fill existing force structure and meet current readiness requirements generates natural tension between short-term

necessity and long-term goals. This impacts the Army's ability to properly balance broadening and developmental career opportunities for individuals with the effective employment of their existing talents.

Existing Statute*: The Defense Officer Personnel Management Act of 1980 (DOPMA), as revised in 1990 and again in 1996, provides Service Secretaries some flexibility regarding the management of promotion zones (Title 10 U.S. Code 623) but they are constrained by time in grade requirements that limit tenure in billets (Title 10 U.S. Code 619).

Big Data Strategy*: The Army lacks a comprehensive data usage and disclosure strategy for personally identifiable information related to individual talents and medical data related to physical readiness.

Information Equilibrium*: The level of granularity and detail applied to information regarding talent requirements must match the data available on talent inventory. Maintaining this equilibrium requires data collection on individual KSBs to keep pace with the development of KSB based job descriptions. It further requires unified information technology (IT) solutions using a common lexicon.

Agility and Scale*: The Army Total Force consists of over a million people and Army end-strength expands and contracts based on variables the department cannot control. Therefore, talent management functional solutions must be scalable and workforce planning strategies must include flexibility. Additionally, the inherent nature of warfare demands that numbers – not just talent – remain part of the human capital equation. This perpetuates the natural tension between quantity (personnel inventory requirements) and accuracy (precision talent matching).

Bureaucracy*: Current processes, acquisition law, Department of Defense (DoD) regulations, and service parochialism hinder responsive DOTMLPF-P solution development and integration. Technology change is outpacing the ability of the DoD.

Unity of Effort*: The Army currently lacks a central, integrating authority for the various functions of talent management. Only an executive agent with the necessary resources and authority can coordinate the required actions of multiple stake-owning organizations, synchronize efforts, and generate sustainable reform.

Impediments Supporting Research

Impediment: *Mobile Access to Talent Marketplace*

Highly probable incorporating technological innovations in mobile apps, notification processes vital for competitive advantage

Executive Summary

Advancements in mobile application technology are accelerating with the inclusion of Artificial Intelligence, 5G, and Beacon Technology Process. It is *highly probable* that due to these developments, organizations' ability to leverage mobile apps and data notification will need to incorporate technological advancements to maintaining a competitive advantage. This will occur despite the most current data showing that 42% of website visits occurred from desktop computers.

Discussion

Advancements in mobile application technology are accelerating with the inclusion of Artificial Intelligence, 5G, and Beacon Technology Process.[H] Push notifications are one area that will benefit greatly from these innovations. Three types of platforms are in use for push notifications:[H]

- Entry-level web apps – These provide a basic toolkit for sending push notifications.
- Sophisticated management tools – Higher-level management solutions build on the feature-kit offered by entry-level apps and usually include in-depth analytics, AI-driven personalization, and segmentation.
- Monetization platforms – Advertising networks enable brands to reach new audiences via push notifications from third-party apps and sites.

A 2018 PEW Research Center study showed the global popularity of smartphones. (See Figure 1).

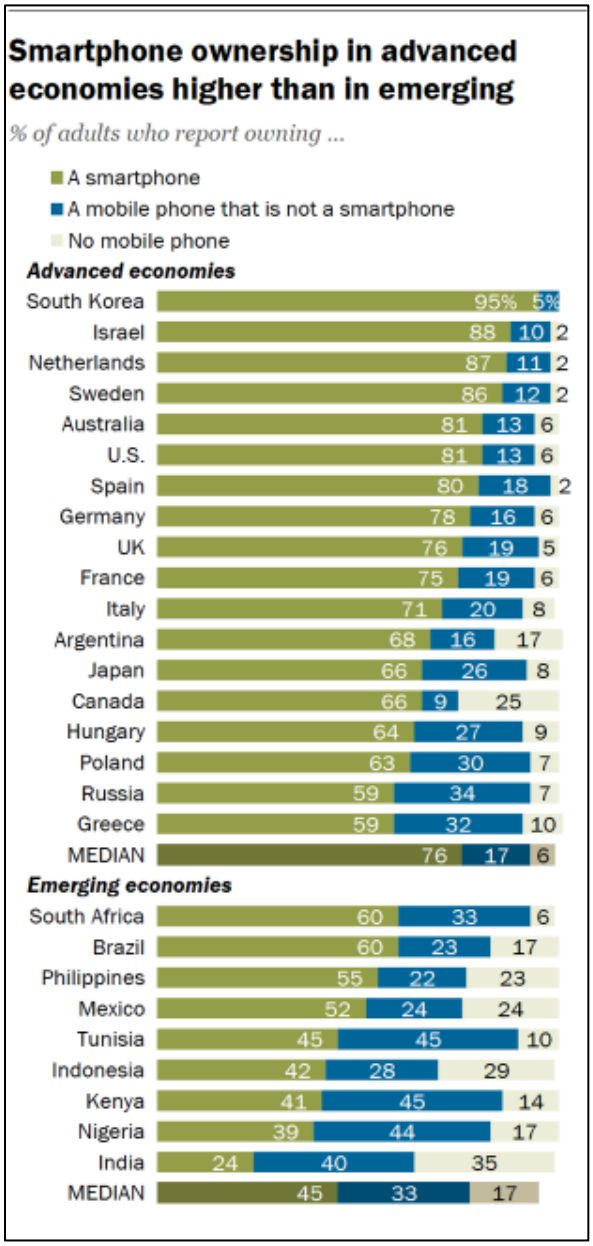


Figure 1: Percent of smartphone ownership. Source: Pew Research

A 2017 study concluded that mobile consumers were on their devices 2x more than desktops. (See Figure 2).

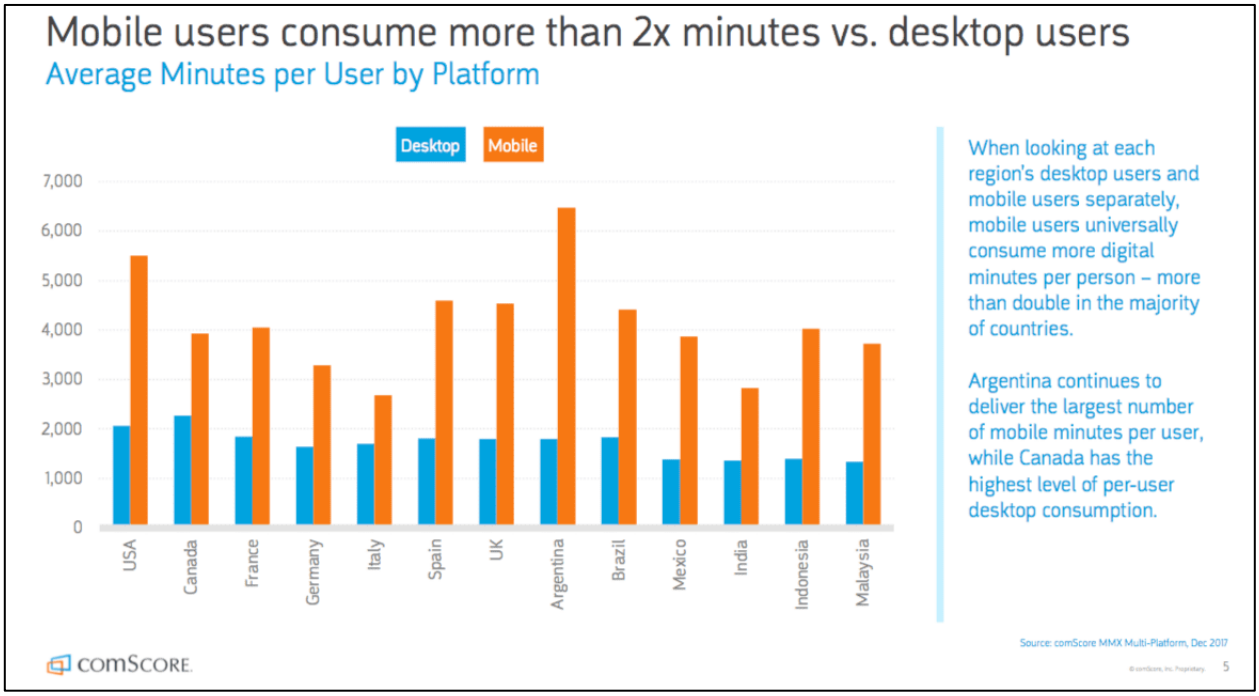


Figure 2: Mobile vs. Desktop usage; average use by platform. Smart Insights

AI can aid organizations in targeting push notification recipients and in personalizing messaging.[H] For beacon-powered mobile apps, whenever an enabled device enters the beacon's zone, that app catches the signal and accordingly shows the device owners fitting notifications.[M] Globally renowned companies like Samsung and Verizon are already working to bring 5G-capable chips in the market. 5G will allow sensors to be built into appliances, security systems, health monitors, door locks, cars and wearables from smartwatches to dog collars.[H] A report by Strategy Analyst predicts that the number of connected devices will reach 50 billion by 2030. (See Figure 4).

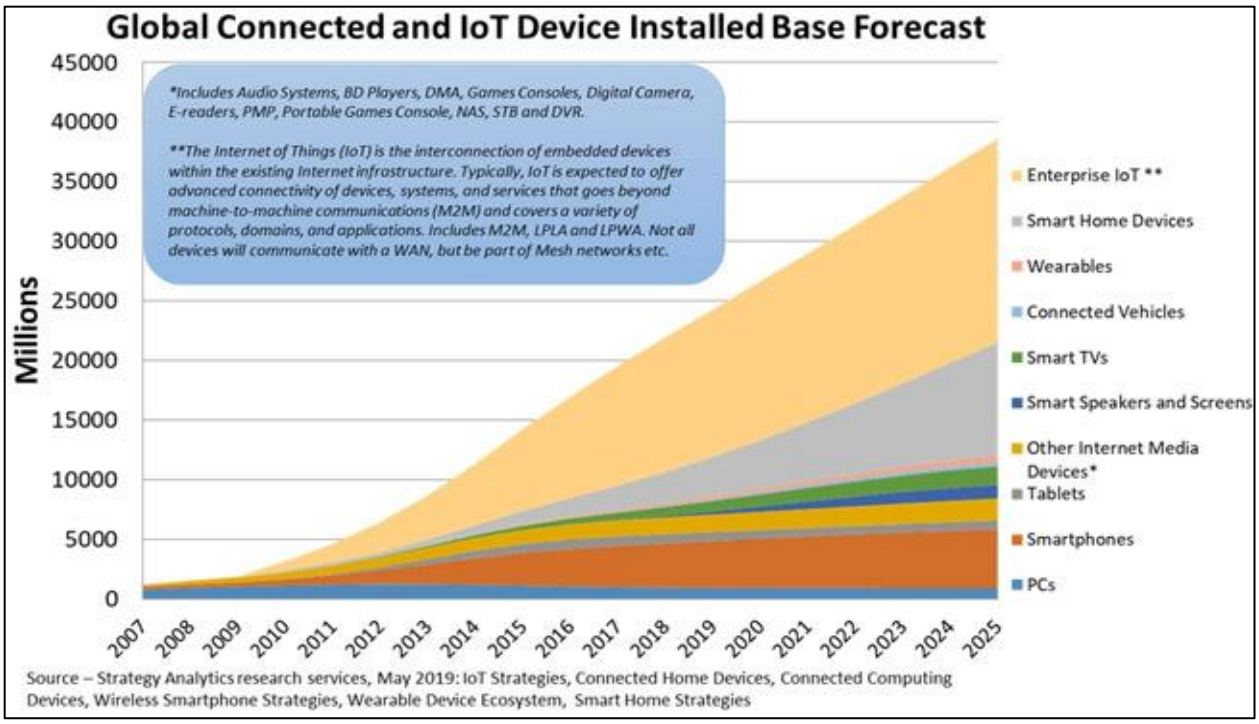


Figure 3: Forecast for growth of globally connected devices. Source: HelpNet Security

Incorporating emerging technologies will enable an organization to optimize notification opt-in rates. The literature agrees that factors such as the timing, language, frequency, visual attractiveness, and personalization of push notifications increase effectiveness and opt-in rates.H,M, and M

Businesses that do not invest in these capabilities risk a competitive imbalance. A 2020 Tech Times report showed that over 80% employees and customers use their mobile devices to search and receive for information. Benefits to industry include:M

• **Business Exposure.** Smart phone users spend at least 162 minutes daily on a couple of apps on his/her smart phones.

• **Customers Loyalty.** Businesses communicate directly with their customers via In-app purchases, ads, promotions, and notifications sent to customers' phone via apps.

• **A Viable Marketing Tool.** Customers are made aware of promotional offers by push notifications.

• **Increases Sales.** Mobile apps have been used to increase sales; UK's Domino's Pizza increased their sales by 28 percent after the release of its mobile app.

• **Excellent Customer Service.** Mobile apps offer consumers quality customer service experience available all round the clock, at no extra cost.

● **Creating Brand Awareness.** In-app offers and promotions through mobile apps can keep a customer engaged and inclined to patronize such business.

● **Increases Accessibility to Customers.** Mobile apps increase a business accessibility to potential customers, as more than a billion of the world population are mobile smart phone users.

● **Source of Data and Information.** Businesses can make use of mobile apps to source for information about customers preferences and behavioral patterns.

The increase incorporation of emerging technology for smartphone push notification will occur despite the 2019 data showing that 42% of website visits occurred from desktop computers; a slight increase from 2018.[H] 96% of the US population ages 18-29, the target demographic for the Army of 2035, owned smartphones.[H] This makes it essential that push notifications to mobile devices incorporate emerging technologies.

Analytic Confidence

The analytical confidence in this estimate is high. There was adequate time and the task was not overly complex. The reliability of the sources were all medium-to-high. The sources and accompanying analysis all tended to corroborate each other.

Author: Andrew L. Heymann

Impediment: *Army Civilian Hiring Practices*

Improved Civilian hiring process highly likely a critical component of recruitment and retention of talent by 2025 due to ever increasing competition for talent across the marketplace

Executive Summary

As technological advancements over the next five years continue to strain the market for skilled labor, a streamlined Army Civilian hiring process is *highly likely* critical in recruitment efforts. Job seekers apply to multiple job openings simultaneously which often results in receipt of multiple offers. While the corporate hiring timeline generally averages under 45 days, the Army struggles to hire in under 100 days. A secondary challenge is word of mouth due to poor experience with the hiring process. In this increasingly connected environment, referrals and recommendations from others carries a greater value.

Discussion

The increased use of social networks and online marketing for recruiting coupled with a tightening market for skilled talent over the past few years has driven a need for improved recruitment experience.[H] In order to recruit and hire top talent, speed and quality of the hiring process are two important factors impacting the talent pool. To accomplish this delicate balance between speed and quality it is important to ensure that you have an efficient hiring process in place across your organization.[H] Organizations that do not enable seamless communication with candidates throughout the hiring process are missing opportunities to influence the candidate in a positive manner.[M]

The average time to hire across the civilian sector is under 45 days.[M] This timeline results in the need to communicate effectively and quickly with potential hires in order to keep them informed of the status of their application. Timely feedback to candidates can be tailored to the individual via mobile applications allowing for multiple candidate touch-points from application to interview and offer stages.[M] Timely feedback can also ensure that candidates are not lost to faster competitors.[M]

In a recent study 80% of job seekers stated that they would not reapply to a company that did not notify them of their application status.(Figure 1) This dissatisfaction has second and third order effects due to word of mouth from affected candidates.[H] As the Army continues to fight for talent that is hard to recruit and retain, the increase use of timely feedback to candidates will be critical.

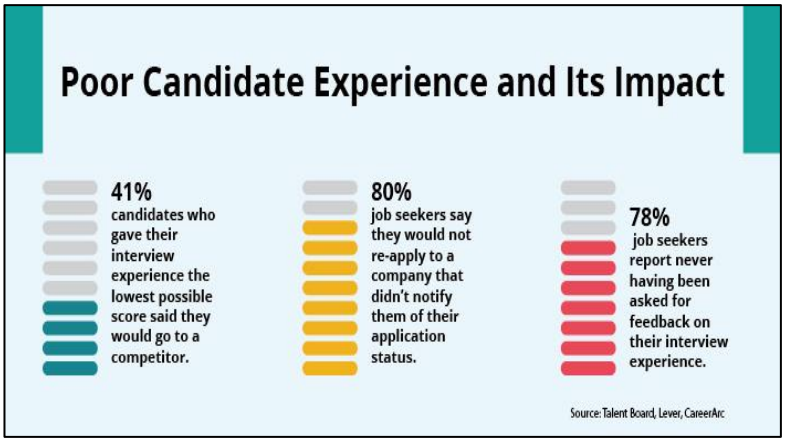


Figure 1: Impact of candidate experience. Source: Talent Now

The current DoD hiring system, USAJobs is neither timely nor efficient. Over the past decade, the DoD has struggled to keep hiring timelines under 100 days, often exceeding that number. In 2018, the time-to-hire was at 106 days, much improved over 2009's 122-day average.[H] While that's a move in the right direction, it's a disappointment considering agencies once brought on new employees within an average of 87 days back in fiscal 2012.[H] The DoD averages are at best double, and at worst triple, the civilian sector, clearly the war for talent will be a critical element in the future. "What we're doing is not achieving the results that we think we need," Heitkamp said. "It's frustrating, and it's only going to get worse as the job market gets more competitive. We are not in a spot where we are a preferred employer anymore. The days of my dad saying, 'It [would be] great, you get a government job.' No one says that anymore, that I know of."[H]

Unfortunately, the very framework of USAJobs undermines efficiency while unable to assist in identifying the best talent. In 2018, then Secretary of the Army, Mark Esper said, "I think any system where you have to go on a website and assert that you're an expert in anything forces people to be dishonest," he said. "If the tricks of the trade are to read the job description and then mimic it back, it's a fundamentally flawed system."[H] A 2016 Forbes article revealed the average federal resume at 5-7 pages, however it's not uncommon for them to be quite longer depending on complexity of the job posting.[H] With civilian sector resumes typically in the 1-2 page range,[M] immediately the government sector is operating at a disadvantage.

Further complicating the hiring process in USAJobs is that Generation Z employees, which will by most of the workforce in the next 10-15 years, (see analysis on Gen Z – Cultural Shift) do not want a lengthy hiring process. Old hiring practices will not work

for newer generational applicants. “An application process that’s too time-consuming or requires a large amount of paperwork will cause Gen Z applicants to bail.”[M] Hiring processes that allow for simpler applications that are mobile friendly will attract the talent needed to remain competitive and improve the speed of hiring. A recent study showed that 81% of candidates expect the hiring process to take less than 2-weeks.[M] One recent study revealed that 38% of candidates receive multiple job offers when looking for work. Of those that received multiple offers, 63% accepted another offer because it took too long for them to hear back on their preferred role.[H] (Figure 2)

Office of Personnel Management (OPM) policy also serves as a barrier in certain markets.[H] One example resides in the long standing policy of not hiring certain specialities without a year or more of job experience. Unfortunately as current Civilian staff acquire additional training and education and are certified at the next level, they are forced to leave the government system in order to start working using their new skills. This practice goes against research on up-skilling (Upskilling Requirement) and serves as another opportunity for improvement to Army Civilian hiring.

The focus, however, cannot be simply on the candidates that the organization wants to hire or retain. In the area of recruitment, word of mouth is critical as one recent Nielsen study revealed that 92% of consumers around the world say they trust earned media, such as word-of-mouth or recommendations from friends and family, above all other forms of advertising.[H] A lack of timely feedback, inefficient hiring processes and systems that fail to consider candidate needs hurt word of mouth leading to decreased organizational trust.

Figure 2: Risk of Delayed Recruitment. Source: TalentLyft

Analytic Confidence

The analytic confidence for this estimate is high. Sources were reliable and all tended to corroborate one another. There was adequate time and the task was not overly complex.

Author: John A. Urciuoli

Impediment: *Stability*

Gen Z, 30% of U.S. workforce in 10 years, likely driving employers to provide a tech-focused but stable workplace to attract top talent

Executive Summary

Gen z workers *likely* look for employers who are on the cutting edge of technology and offer room for professional growth, while providing a stable and enjoyable workplace. As of 2020, there are 9 million Gen Zers in the U.S. workforce and that number is expected grow reaching a third of all employees by 2030. This shift in demographics presents challenges to employers as they compete for top talent amid rapidly changing technology and shifting skill requirements. Gen Z's predecessors, the millennials, valued portability, flexibility, and for a variety of economic and demographic reasons, the ability to move between employers or even industries.

Discussion

According to the Pew Research Center, Gen Z babies came into the world from the late 1990s to 2010. They now range in age from tweens to early twenties and are the largest generation in the world right now. [H] According to Forbes, Generation Z is bringing a new view of work and outlook on the world as they enter the workforce. In a 2019 survey of college students across 12 global economies, business students ranked high future earnings as the most attractive attribute for an employer (49.1%), followed by professional training and development (43.8%), secure employment (39.1%) and a good reference for their future career (38.8%). Among their career goals were work-life balance (52.8%), to be secure or stable in their job (45.2%) and to be a leader or manager of people (35.5%). [M]

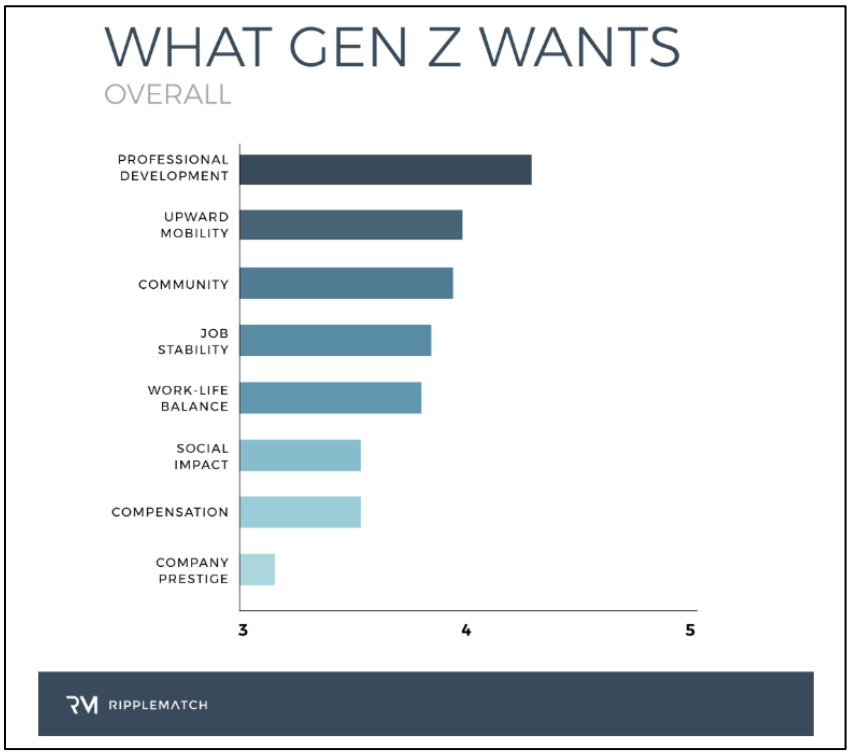


Figure 1: GenZ Work desires. Source: Ripplematch

Unlike Millennials, who typically buck tradition in the workplace and appear to be driving the flexible work revolution, Gen Z craves something very different. Stability. "It's fascinating to see that most adults think I would prioritize such things as being able to work from home," says Tara Ellwood-Mielewski, 17, a senior at Rudolf Steiner High School of Ann Arbor, Michigan. "No one is more shocked than my mother when I say that I want a stable, 9-to-5 job." H GenZ grew up dealing with the fallout of the 2008 economic crisis which has greatly influenced what they consider important in a career. Despite a recent strong economy, Gen Z still faces a sense of instability in the world as demonstrated by the COVID-19 pandemic as well as across a spectrum of issues such as climate change, government, diversity, and protection of the environment. H

According to the Harvard Business Review, "Most organizations struggle to find the right balance between stability and change, which in turn affects individual contributors. But in the race for innovation and digital transformation, the idea of stability has been somewhat lost in the mix, and there are strong indications that we should revisit its merits. If you want to develop an environment where contributors thrive, your workforce must be able to count on some basic things — such as role clarity, timely feedback, adequate resource allocation, and attention to how our work is structured." H

The importance of stability in the workplace goes beyond just the Gen Z workforce. Military families cite instability in the service member's career as a significant source of stress which can affect retention. The 2019 Blue Star Family Survey shows that concerns over stability was a combination of factors. These factors include lack of access to adequate and affordable childcare, military career complicates spouse ability to maintain employment, significant underemployment of spouses who do work, and the stress of permanent change of station moves on the family and children's education. H

Although employers are wise to begin addressing some of the factors that affect stability in the workforce in preparation for the large influx of Gen Z, they should be agile enough to continue some of the flexible work options currently seen as desirable by the millennials. As Gen Z ages and begins having children of their own their needs and essential work conditions may change.

Analytic Confidence

The analytic confidence for this estimate is high. The reliability of the sources are high and all tended to corroborate one another. There was adequate time, but the analyst worked alone and did not use a structure method.

Author: Vincent A. Amerena Sr.

Impediment: *Military Compensation*

The Army of 2035 is highly likely to see demand and require additional compensation for science, technology, engineer and mathematical fields will grow compared to other fields

Executive Summary

Due to changing skill requirements in the marketplace, it is *highly likely* the demand and compensation for science, technology, engineer and mathematical (STEM) skills will continue to grow compared to other fields. Despite studies showing a 50 percent decline in the disparity of compensation between STEM and non-STEM occupations after ten years of employment, it is *highly likely* the demand for STEM skills will require higher compensation in the Army of 2035 to meet talent acquisition and retention requirements as compared to non-STEM fields.

Discussion

STEM skills are in increasingly short supply in the US marketplace and are critical to economic growth and U.S. competitiveness in the world. Employment in nearly all major occupational groups is projected to increase from 2018 to 2028. (Figure 1 next page) The fastest growing groups include computer and mathematical occupations (12.7 percent) and healthcare practitioners and technical occupations (11.9 percent).[H] As depicted in the Figure 1 on the next page, the wage discrepancy between the STEM occupations (circled in red) and most others is substantial.

Employment by Major Occupational Group, 2018 and Projected 2028 (Numbers in thousands)

2018 National Employment Matrix title and code		Employment		Change, 2018–28		Median annual wage, 2018(1)
		2018	2028	Number	Percent	
Total, all occupations	00-0000	161,037.7	169,435.9	8,398.1	5.2	$38,640
Management occupations	11-0000	10,193.3	10,900.2	706.9	6.9	$104,240
Business and financial operations occupations	13-0000	8,589.5	9,181.3	591.8	6.9	$68,350
Computer and mathematical occupations	15-0000	4,674.4	5,268.3	593.9	12.7	$86,340
Architecture and engineering occupations	17-0000	2,699.1	2,812.4	113.3	4.2	$80,170
Life, physical, and social science occupations	19-0000	1,322.7	1,420.2	97.4	7.4	$66,070
Community and social service occupations	21-0000	2,730.1	3,036.4	306.2	11.2	$44,960
Legal occupations	23-0000	1,346.0	1,439.3	93.3	6.9	$80,810
Education, training, and library occupations	25-0000	9,647.4	10,160.3	512.9	5.3	$49,700
Arts, design, entertainment, sports, and media occupations	27-0000	2,899.8	2,996.6	96.8	3.3	$49,290
Healthcare practitioners and technical occupations	29-0000	9,107.8	10,190.4	1,082.6	11.9	$66,440
Healthcare support occupations	31-0000	4,515.6	5,100.8	585.2	13.0	$29,740
Protective service occupations	33-0000	3,560.9	3,656.0	95.2	2.7	$40,640
Food preparation and serving related occupations	35-0000	13,664.0	15,152.2	1,488.3	10.9	$23,070
Building and grounds cleaning and maintenance occupations	37-0000	5,756.9	6,047.7	290.8	5.1	$26,840
Personal care and service occupations	39-0000	7,117.2	8,354.8	1,237.6	17.4	$24,420
Sales and related occupations	41-0000	15,728.6	15,648.8	-79.8	-0.5	$28,180
Office and administrative support occupations	43-0000	22,973.6	22,365.5	-608.1	-2.6	$35,760
Farming, fishing, and forestry occupations	45-0000	1,096.9	1,100.0	3.2	0.3	$25,380
Construction and extraction occupations	47-0000	7,212.5	7,916.5	704.0	9.8	$46,010
Installation, maintenance, and repair occupations	49-0000	6,108.1	6,341.3	233.2	3.8	$45,540
Production occupations	51-0000	9,452.4	9,022.9	-429.5	-4.5	$35,070
Transportation and material moving occupations	53-0000	10,841.0	11,324.1	483.1	4.5	$32,730

Footnotes:
(1) Data are from the Occupational Employment Statistics program, U.S. Bureau of Labor Statistics. Wage data cover non-farm wage and salary workers and do not cover the self-employed, owners and partners in unincorporated firms, or household workers.
Source: Employment Projections program, U.S. Bureau of Labor Statistics

Figure 1: Employment by Occupation Projections. Source: Bureau of Labor Statistics

Computer and mathematical occupations account for 6 of the 30 fastest growing occupations. Increasing use of mobile devices will drive demand for software developers, which is projected to experience employment growth of 25.6 percent. The need for robust online security will also rise as more connected devices enter homes and workplaces. This increased need for cybersecurity will drive demand for information security analysts, employment of which is projected to grow by 31.6 percent.[H]

STEM graduates in applied subjects such as engineering and computer science earn higher wages initially, because they learn job-relevant skills in school. Yet over time, new technologies replace the skills and tasks originally learned by older graduates, causing them to experience flatter wage growth and eventually exit the STEM workforce. Faster technological progress creates a greater sense of shortage, but *it is the new STEM skills that are scarce, not the workers themselves*.[H] Upskilling workers with emerging and evolving STEM skills is projected to be essential in an ever-advancing technological age. Marta Michicot, Chief People Officer at Telifonica recently said, "We have identified the need for new skills around big data, artificial intelligence, and cybersecurity, among others, to accommodate the changes taking place in the business around the workforce."[H]

Despite this scarcity of skills, earnings premium for STEM majors is highest at labor market entry and declines more than 50 percent in the first decade of work life. This pattern holds for "applied" STEM majors such as engineering and computer science, but not for "pure" STEM majors such as biology, chemistry, physics and mathematics.[H]

According to the May 2019, Congressional Research Study on Military Pay:

> "Some have suggested that the emphasis on a pay gap, whether real or not, is an inappropriate guide to arriving at sound policy. They argue that the key issue is, or should be, not comparability of military and civilian compensation, but the competitiveness of the former. Absent a draft, the Armed Forces must compete in the labor market for new enlisted and officer personnel. The career force by definition has always been a "volunteer force," and thus has always had to compete with civilian opportunities, real or perceived. Despite these facts, some ask what difference does it make whether military pay is much lower, the same, or higher than that of civilians? If the services are having recruiting difficulties, then pay increases might be appropriate, even if the existing "gap" favors the military. Conversely, if military compensation is lower than equivalent civilian pay, and if the services are doing well in recruiting and retaining sufficient numbers of qualified personnel, then there might be no reason to raise military pay."[H]

With the dearth of undergraduate degrees required for the U.S. economy in 2029[H] it is *highly likely* the Army will need additional compensation of low density and critical STEM fields to retain and remain competitive in the US marketplace for talent.

Analytic Confidence

The analytic confidence for this estimate is high. The reliability of the sources is high. The sources and accompanied analysis all tended to corroborate each other irrespective of location in the world. There was adequate time and the task was not complex.

Author: Martin D. Lepak

Impediment: *Physical Requirements*

Army highly likely to face recruiting shortfall in the next 10-15 years due to increasing impact of obesity, lack of exercise, and declining eligibility

Executive Summary

Overall decline in the cohort of 17-24 year old Americans by the year 2035 coupled with rising obesity rates and low exercise rates is *highly likely* to undermine Army recruiting programs. Expected increase in rates of the ineligible population will further erode potential candidate pool while flat or declining immigration rates will fail to provide any relief.

Discussion

Army recruiting challenges include declining number of 17-24 year olds predicted by the year 2035. Current population of that demographic is 34 million,[H] however it will drop by 18% to approximately 27.8 million by 2035.[H] Reduction in overall population will be further exasperated by the expected increase of ineligibility overall from 71% to 74%.[M]

Increase in obesity will largely drive this increase of ineligibility. (Figure #1) Current obesity rates across the nation are at 39%, with predictions of 50% by 2030.[M] Further amplifying the impact is over reliance on the southeast for recruitment. The southeast currently provides 44% of new accessions into the military while also being among the most obese states in the nation.[H] Adding to recruiting challenges is that "rates of diabetes, heart disease, and certain cancers are much greater in the South than they are in the rest of the country" according to a 2018 Citadel report.[H] Efforts to shift recruitment to other states and regions may prove effective, however increase in eligibility is negligible.

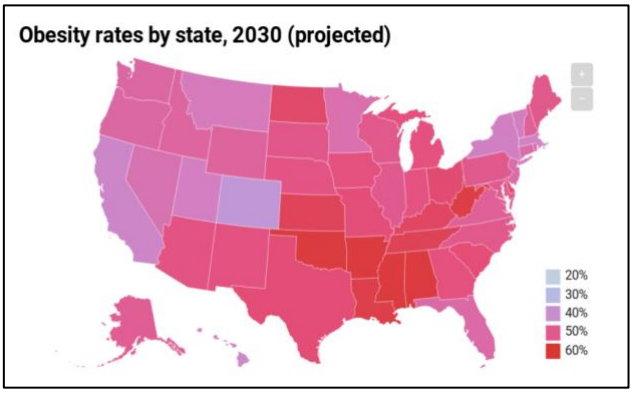


Figure 1: Projected Obesity Rates. Source: Time

Obesity are not only higher in the south but rates of physical inactivity in the southeast are among the worst in the nation.[H] According to a recent CDC report, only 23% of U.S. adults get the recommended amount of exercise per week.[H] Mirroring the national report on obesity, the southeast region of the United States ranks among the worst states in the country for exercise, coming in significantly below the recommended

amount. (Figure #2) A variety of factors are believed to drive this data, from poverty rates to lower education levels.[H]

Adding complexity is that recruits from the south have been reported to be the most unfit and injury prone.[M] This slows training and graduation rates while incurring increased costs to the government and undermining unit readiness. Southern states also currently have the highest percentages of ineligibility for accession as well as the highest rates of self-reported physical inactivity. These combining factors will continue to impact recruitment efforts in the years ahead.

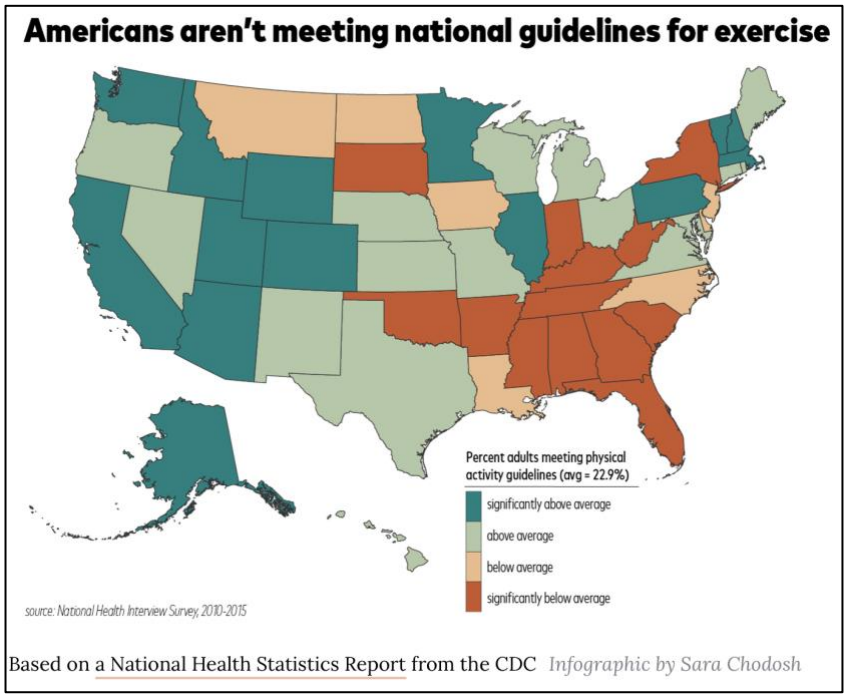


Figure 2 : Exercise Report. Source: Popular Science

A past positive impact to recruitment included immigration, however immigration rates are declining. In 2019, immigration rates were at their lowest rates over the past decade.[H] This decline will *likely* result in a negligible increase in available 17-24 years olds by the year 2035.

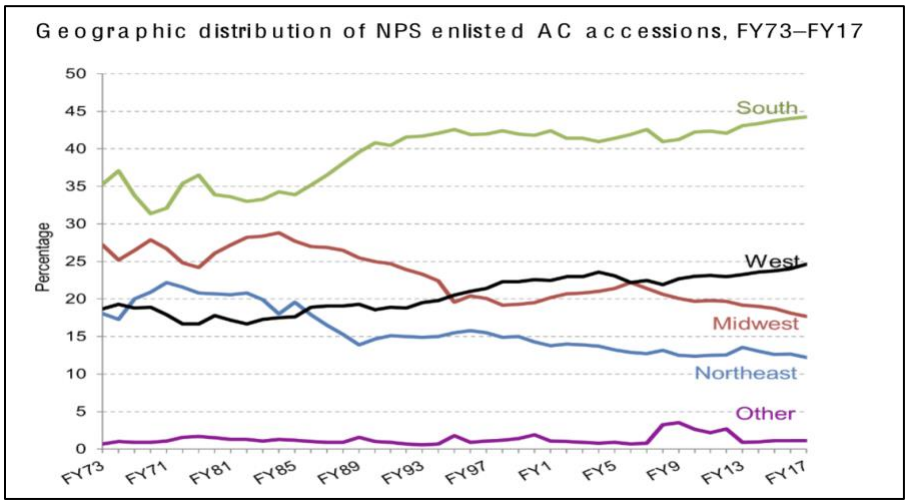


Figure 3: Accessions Regions. Source: New York Times

Analytic Confidence

The analytic confidence for this estimate is moderate. Sources were generally reliable, and all tended to corroborate one another. There was adequate time, but the analyst worked alone and did not use a structure method. Furthermore, given the length of time frame of the estimate, this report is sensitive to change as national and state programs attempt to influence change.

Author: John A. Urciuoli

Additional Research

Artificial Intelligence in recruitment likely to grow 50% in next 3 years due to focus on predictors of future success, increased efficiencies, and improved experience

Executive Summary

The use of Artificial Intelligence in recruitment is *likely* to grow 50% by 2023 due to employers' focus on predictors of future success coupled with desire for improved efficiencies in the hiring process. Those two factors will drive an improved experience for potential candidates and assist a company in hiring the right candidate. Previous analysis (Link to Analysis) revealed increasing competition is ongoing for qualified candidates due to skilled worker shortages in many sectors. Among the critical shortages are workers with soft skills which is resulting in the increased use of artificial intelligence (AI) in recruitment. AI has already been in use to cull through resumes; however, many major industries are now using AI to analyze soft skills, compare results with current employee base, and predict future performance of potential despite the fact that many employees prefer past performance assessment.

Discussion

A candidate's potential, more than their past success, is *likely* to drive the future of recruiting. Current recruiting efforts across industries rely heavily on past success while taking in little account of potential.[H] The most effective way to test for soft skills is to utilize some type of behavioral test or questions (Figure #1) in the interview process, yet hiring managers have traditionally tended to focus on past experience and success instead. Yet studies show that 89% of bad hires lack these soft skills.[H] This finding highlights one of the underlying reasons that many industries have adjusted hiring and interview practices through the use of AI.[M]

Figure 1: Assessing Soft Skills.
Source: Global Talent Trends

One recent study by Mercer indicated that 59% of U.S. companies plan to increase their use of automation in HR this year.[H] Additionally, another study showed 31% of firms

primary HR automation use is AI. Among the remainder of respondents, 58% placed AI in their top three programs used in the hiring process.[H]
Disruptive technologies and the increased capabilities of robotics will reduce many traditional human functions in the next decade.[M] As companies shift to the skills of the future, reliance on past success and the traditional resume will be reduced. Current industry estimates highlight many jobs of 2035 and beyond do not yet exist which indicates a fast developing and shifting job market.[H] This quickly shifting market will reduce the half-life of hard skills while increasing the importance of soft skills, especially the ability to adapt and learn.[H] The ability to adapt and learn, hard to gauge utilizing traditional interview methods becomes increasingly apparent utilizing AI functionality.

Technology is already in use to analyze candidates for a variety of skills in order to better predict adaptability. One such skill is Learning Quotient (LQ) which examines an applicant's ability to come into a new situation, learn, and adapt. It helps to identify the ability of the applicant to learn, unlearn, and relearn all without missing a step.[H] The increase of AI in the recruitment process will enable employers to assess this aspect of candidates better than ever before.

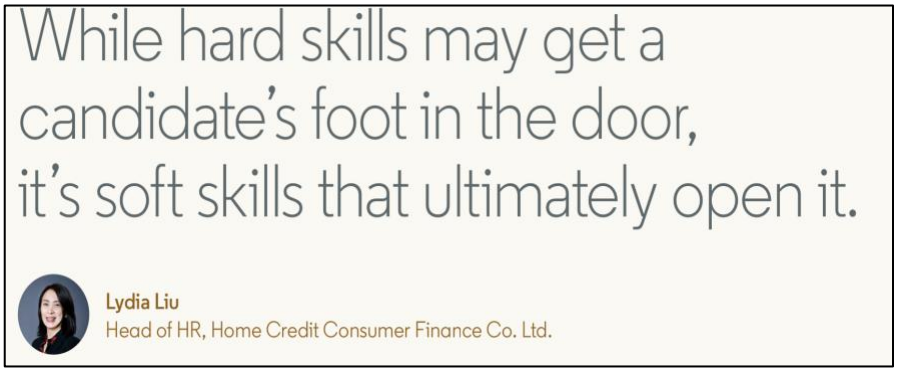


Figure 2: Soft Skills. Source: Global Talent Trends

Employees with higher LQ are traditionally also willing to learn and grow on the job in order to stay relevant in the marketplace.[H] Many organizations are currently offering up skill programs to employees in order to help them move laterally or up through an organization to fill gaps.[H]

Industry leaders such as Kraft Heinz, Unilever and JP Morgan Chase are using an online AI program that has potential employees play a half hour video game that assesses their risk taking and decision-making skills. Other games measure memory and concentration, asking players to remember and repeat increasingly long sequences of numbers; while other games registered how generous and trusting applicants might be.[H] These results were then used to assess candidates against over 250 known performers at Kraft Heinz to compare known performance against potential performance. Use of AI also provides the ability to refine the talent search and type of individuals hired. In recent years, 70% of new hires to Kraft Heinz were engineers. Through the results of AI implementation that number is now around 40% while performance is better than expected across the board. [H]

Analytic Confidence

The analytic confidence for this estimate is moderate. The reliability of the sources are moderate to high and all tended to corroborate one another. There was adequate time, but the analyst worked alone and did not use a structure method. Current cost of AI implementation could impact this analysis.

Author: John A. Urciuoli

Increasing retention shortfalls in the next 8-12 years due to changing demographics, spouse employment challenges and shifting family dynamics

Executive Summary

Despite current initiatives and ongoing successes, the Army is *likely* to face increasing retention shortfalls in the next 8-12 years due to changing demographics, spouse employment challenges, and shifting family dynamics. Increased average marrying ages, for example, leads to younger children at home. This has a dual impact of limiting spouse employment opportunities and negatively impacting family earnings potential. Increasing number of pre-school aged children is *likely* to impact in 8-12 years as the effects of deployments are seen in the teen years. While current retention programs alleviate some of the financial concerns, they are unable to affect deployment impacts which can weigh heavily on military families' retention decisions.

Discussion

Army retention success in recent years highlights positive impacts of current programs. Over the past four years, the Army has met or exceeded retention goals with programs focused on retention bonuses, installation of choice, and stabilization.[H]

Shifting demographics are *likely* to negatively impact this success in the next decade as the Army attempts to address family needs amidst the changing environment. Over the past 30 years the average age of marriage has increased from 22-23 to 28.[H] (Figure #1) In 2017, women in their 30's outpaced women in their 20's as having the most children.[M] This downward shift in children's age challenges families' desire for continued service.

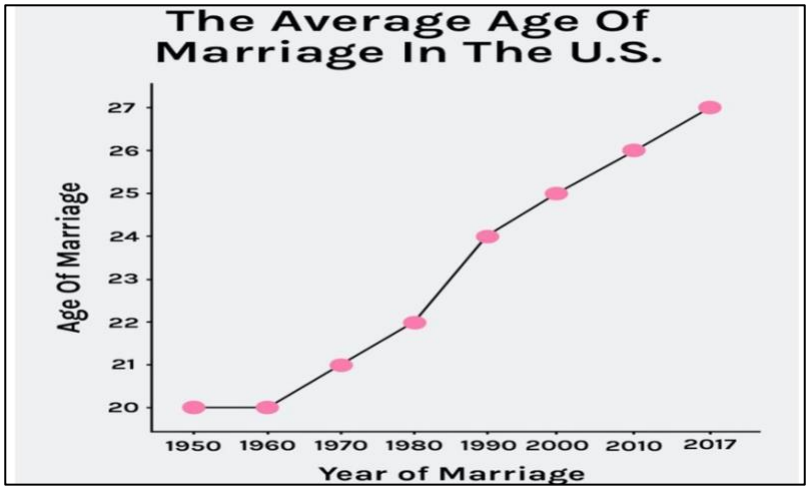


Figure 1: Shifting Demographics of Average Age of Marriage in US
Source: Women's Health

One study showed a significant shift in spouse talent and employment over the last decade. Prior to 2010, only 25% of unemployed spouses were actively seeking work, since 2010 that number has more than doubled to 58%.[M] Continued frustration of military spouses with the inability to apply skills and certifications within the job market

are *likely* to discourage support of continued service. Additionally, multiple reports show the impact of pre-school age children and the lack of affordable childcare availability as major barriers to employment.H

Millennial respondents (70%) were significantly more *likely* to report having two incomes as more vital to their family's well-being than older respondents (63%), regardless of rank. Military families report higher rates of difficulty making ends meet in comparison to civilian families (13% vs. 7%), indicating the need for two incomes as not just an expectation but a necessity for financial security.H

Of the top five concerns to military families as outlined in the Blue Star Family Life Survey, four deal with the impact of deployments and training, employment, and pay.H Deployments and rotations related to the operations tempo will continue to negatively impact children's connection to the service member. A 2014 study revealed that children

TOP ISSUES	Military Spouses	Service Members	Veterans
Military spouse employment	**48%**	27%	13%
Amount of time away from family	**45%**	**50%**	27%
Dependent children's education	**44%**	**33%**	16%
Military family stability	**42%**	**44%**	19%
Lack of military career control	**34%**	**41%**	15%
Military pay	33%	**33%**	29%
Access to VA/military health care	18%	22%	**49%**
Understanding of military/veterans	14%	12%	**38%**
Military benefits	16%	19%	**37%**
PTSD/combat stress/TBI	11%	7%	**30%**
Veteran employment	8%	12%	**30%**

Figure 2: Top Military Family Concerns. Source:2019 Blue Star Family Report

in military families have significantly more mental health problems including anxiety, depression, externalizing behavior problems, suicidal ideation, and substance use.H Deployments have an increased impact between birth and five years of age. Between 2005 and 2018, military children in that demographic increased from 32%H to 41%H a significant shift *likely* to impact retention as those children enter into adolescence.

Analytic Confidence

The analytic confidence for this estimate is moderate. Sources were reliable and all tended to corroborate one another. There was adequate time, but the analyst worked alone and did not use a structure method. Furthermore, given the length of time frame of the estimate, this report is sensitive to change as multiple current initiatives have not had time to be assessed for effectiveness.

Author: John A. Urciuoli

Millennials and Gen Z likely to demand workplace culture that emphasizes inclusive values, flexible career paths, growth opportunities, stability

Executive Summary

Generational changes in the workforce by 2035 will *likely* be a driver for cultural change within the Army. By 2035, Baby Boomers (born 1946-1964) and almost all Generation X (born 1965-1980) will have retired, Millennials (born 1981-1996) will be filling upper management or approaching retirement, and Gen Z will fill most of the entry and middle-management positions across the Army (See Figure 1). These generational factors are *likely* drivers of Army cultural adjustments with a greater emphasis on inclusive values, career flexibility, growth opportunities, and stable benefits. These changes are *likely* despite the uncertainty of how immigration policy and economic factors will influence competition.

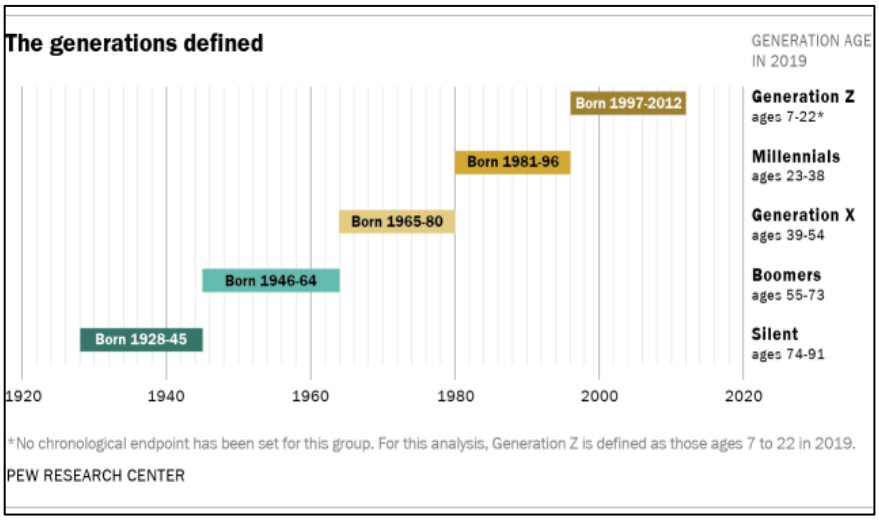


Figure 2: By 2029, all Baby Boomers will be 65 or older.
Source: Pew Research Center

Discussion

Generation Z, the largest of all generations, makes up about 26% of the world population at just under two billion people, 60 million native-born Americans, and defines individuals generally born between 1997 and roughly 2015 (Figure 2).[H] By 2035, Generation Z will make up the population the Army must recruit and retain. Millennials who make up 40% of the workforce between 2020 and 2030 will be aging and *likely* close to Army retirement age.[H]

Current studies show that Millennials and Gen Z share a great number of values and attributes including flexible work schedules, workplace preferences for modern and open office environments, and attachment to technology within the workplace.[H] Culture is increasingly becoming important to Generation Z as they search for jobs and careers that align with their values. Generation Z, though three times more *likely* to change job than the Baby Boomers , are staying at their jobs longer because they enjoy the work,

they value the relationships with their coworkers, they have opportunities to learn and grow, and they desire stable and secure career over just high-paying salaries.[M]

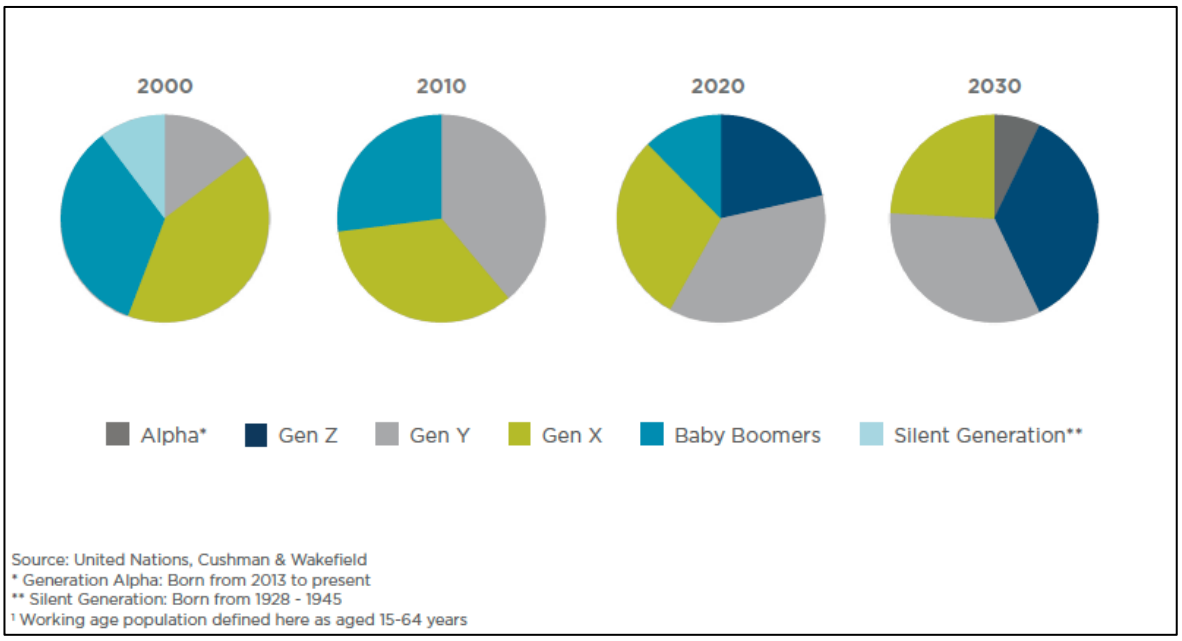


Figure 2: Proportion of Working Age Population, 2000-2030.
Source: United Nations, Cushman & Wakefield

Recruiting and retaining Gen Z will require the Army to brand itself more in line with values associated with Gen Z. Research shows that Gen Z are digital natives and reliant on technology; more diverse and inclusion within the workplace and society; have fewer issues with "blurry" lines associated with work/life balance, marriage, and family that may be non-traditional; and in defining ones identity through both individualism and group identity. [M]

Despite the research associated with Gen Z, they are a young and inexperienced generation within the job market that has experienced steady growth in the economy. Recessionary times, decreases in the job market, or competition within the workforce will *likely* adjust the relative weight this generation places on any one value.[M]

Analytical Confidence

The analytic confidence in this estimate is *moderate*. The reliability of the sources available on this topic were above average with many high-quality sources available for the estimate. The sources available did tend to corroborate each other and analyst collaboration was very strong. The estimates contained within the sources are good, but given the length of time frame of the estimate, this report is sensitive to changes in market and economic conditions.

Author: Steven M. Clark

Increasing private sector competition and demand for high wages requiring a bachelor's degree or higher will probably result in a 5-6% acquisition and retention shortfall of Army officer end strength in next 10-15 years

Executive Summary

Due to increasing competition and demand for high wage jobs requiring a bachelor's degree or higher it is *probable* Army officer acquisition and retention rates will have a 5-6% shortfall in the next 10-15 years. Despite the intrinsic desire of officers to serve their country in an organization with strong values, the competition for undergraduate degrees or higher in the U.S. are a threat to the Army acquiring and maintaining its officer end strength and competitive advantage.

Discussion

In advanced economies, occupations currently require only a secondary education or less see a net decline from automation, while those occupations requiring college degrees and higher grow. [M] Workers of the future will spend more time on activities that machines are less capable of, such as managing people, applying expertise, and communicating with others. They will spend less time on predictable physical activities and on collecting and processing data, where machines already exceed human performance. The skills and capabilities required will also shift, requiring more social and emotional skills and more advanced cognitive capabilities, such as logical reasoning and creativity. [H]

Despite the Army officer corps already requiring cognitive reasoning and creative skills along with a strong intrinsic desire to serve, the trend of greater competition for high wage, high skilled personnel point towards an increasing competitive environment for the Army to acquire and

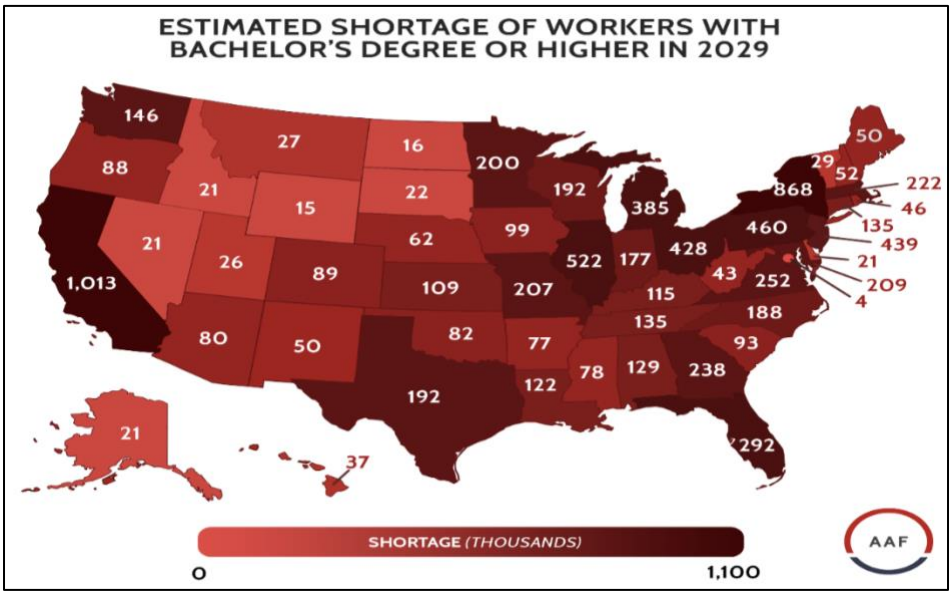


Figure 1: Estimated Shortage of Workers with Bachelor's Degrees
Source: American Action Forum

retain its officers. In its research, the American Action Forum (Figure #1) projects America to have a 5.6% shortage of bachelor degreed workers by 2029.[H] Increasing the probability of lower Army retention rates, bachelor's degree shortage rates exist in states where large Army bases exist (WA, TX, LA, GA, NC, NY, MO, KS, CO) and officers typically leave active duty. See the chart above on estimated shortage of bachelor's degree in 2029.[H]

According to the "New Talent Landscape: Recruiting Difficulty and Skills Shortages" report by the Society for Human Resource Management (SHRM), about two out of every three human resources (HR) professionals surveyed had a hard time hiring for full-time jobs in 2016—up from 50 percent since a similar report in 2013.[H] President and CEO Hank Jackson says this is largely due to a lack of skills and required work experience. According to the SHRM research, 84 percent of HR professionals reported seeing applied skills shortages in job applicants over the last 12 months.[H]

Research is showing a trend of shrinking middle-wage jobs. As a result, it is *probable* the share of high-wage and high-skill jobs will rise by 3.8 percentage points, reaching 34.2 percent of the labor force. This trend will require upskilling, training and education to meet the demand of the workforce (Figure #2).[H]

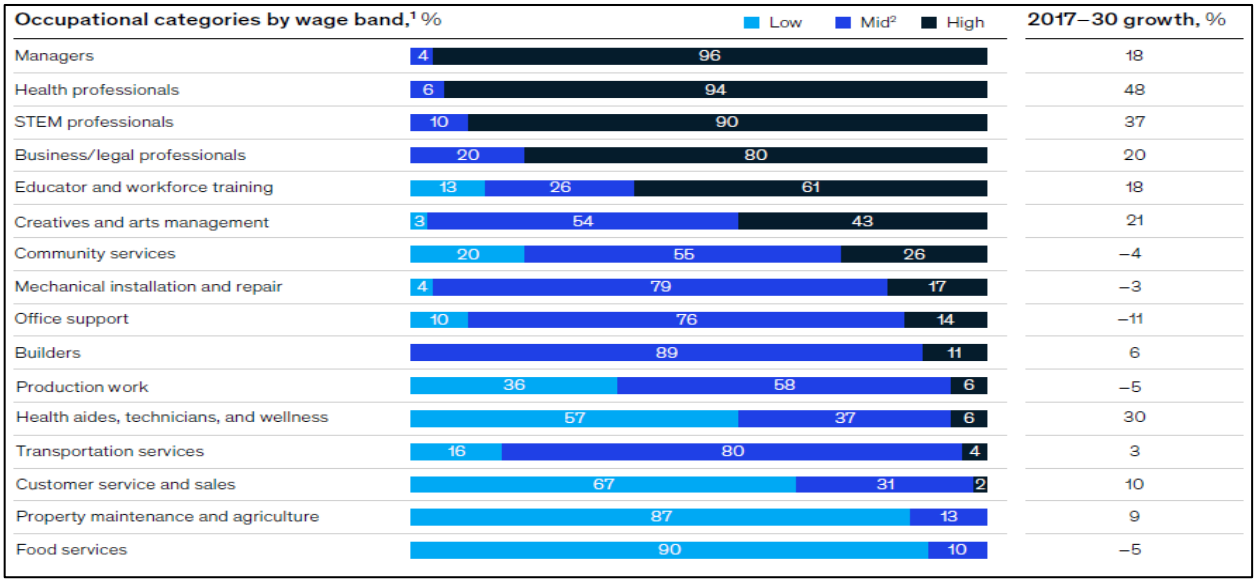


Figure 2: Occupations by wage and forecasted growth through 2030. Source: McKinsey Global Institute

Analytic Confidence

The analytic confidence for this estimate is high. The reliability of the sources is high. The sources and accompanied analysis all tended to corroborate each other irrespective of location in the world. There was adequate time and the task was not complex.

Author: Martin D. Lepak

Soft skills shortages highly likely to increase by 20-30% by 2030 due to technological impacts coupled with generational changes

Executive Summary

Despite headlines touting technical skill shortages, soft skills shortages, in areas such as collaboration and communication, are *highly likely* to increase by 20-30% by 2030 due to technological impacts coupled with generational changes. The impact of automation and technology will further reduce manual labor tasks which currently mask employee soft skill gaps, while increasing technological advancements increasingly expose employee soft skill gaps. As the workforce shifts to increasing numbers of Millennials and Generation Z members, gaps in the soft skills arena are already becoming evident.

Discussion

Between now and 2030 skills gaps across all industries are predicted to increase by 29% in the United States.[H] These gaps have always existed – in smaller numbers – in many industries. In 2010, each worker lacked approximately 1.2 skills needed in any job. Employers used a combination of formal training, encouragement for self-learning, or on the job training to bridge those gaps. As we start a new decade, that number has risen to almost 2 skills missing per employee, with estimates of 2.5 or higher missing skills by 2030.[H]

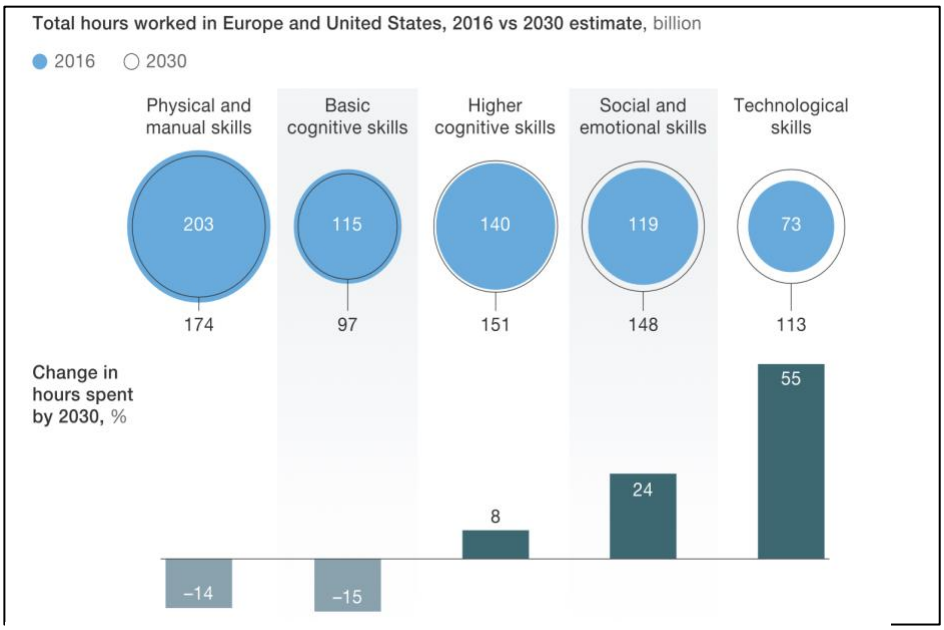


Figure 1: Decline of Manual Labor and Growth of Soft Skills
Source: McKinsey & Company

A large percentage of expected skills gap growth is in soft skills. Soft skills, also referred to as skills of the heart, are essential skills required for workplace success. Skills such as collaboration, critical thinking, work ethic, vision, and communication abilities are what many employers would term as essential. Although agreement exists of their importance, current hiring practices typically lack the ability to test for these skills.[H]

Even Google discovered this issue, not through technology, but through manually culling through thousands of evaluations to determine why some supervisors were failing. What they found was that those supervisors, while technically excellent, lacked soft skills in areas of how to communicate the vision, how to help others with their career, or how to set the example in work ethic. [H] One Google Vice President reflected on Google's initial expectation that an effective manager needed to be as good or better technically than their staff. What research at Google revealed was, in fact, that technical prowess was least important of their skills and their employees instead valued a supervisor who was accessible and able to connect with them.[H]

A recent study highlighting the top reasons Millennials got fired provides further evidence of the importance of soft skills. Lack of vision, miscommunication, and lack of confidence came out as the top three trends from business managers on why Millennials are struggling in today's jobs.[H] In the area of vision it was not just vision for growth, whether personal development or of their team, but is the ability to see their employers perspective on issues. This includes an inability to have a strategic mindset and their role in the bigger picture [H]

Miscommunication issues abound among a cohort raised on technology and not reliant on face to face communication skills. Already an issue among Millennials, expectation for increased impact in the future generations is a key concern. Generation Z members grew up on their parents' digital devices and often lack some aspects of face-to-face communication skills as a result. One study revealed they would rather text than talk in person. [M]

As technological developments of the next decade further reduce jobs with physical and manual skills, as well as those with basic cognitive skills, the offset in work will be partly in areas of social and emotional skills.[H] As these shifts occur, organizations need to be prepared to retrain and redeploy the workforce into new areas of work. Proactively setting up training programs and monitoring gaps in skills will be critical to being able to react to the shift in a timely manner. [H]

Analytic Confidence

The analytic confidence for this estimate is high. There was adequate time and the topic was not particularly complex. The reliability of the sources available on this topic were medium to high. The sources corroborated each other and collaboration between sources were strong.

Author: John A. Urciuoli

Remote work likely to grow to 55% of eligible population by 2035 due to technology improvements, reduced costs, and greater retention of talent

Executive Summary

Remote work, of at least one-day per week, is *likely* to increase from 49% to 55% of eligible employees by 2035. Improvements in technologies have increased security of access to employers' data and will continue to improve as technology-native employees enter the workforce. Additional benefits of increased retention rates among employees and reduced overhead costs will continue to allow for remote work when possible. The increase in remote work, of at least one-day per week, is despite increased concerns over data security and decreased face-to-face collaboration among workers.

Discussion

Increasingly employees want to work from home and technology is allowing more secure means to allow employees to access important files and information using corporate-owned hardware and virtual private network (VPN) or secure virtual desktop infrastructure (VDI).[H] Use of VPN and VDI allow for access to organizational data anywhere with a connection, provides greater security of data while using public connections, maintains privacy, and allows safe download of content.[M] Use of 'cloud' storage for remote workers continues to provide additional resources for access and further increases security, safe storage of data, and greater collaboration.[M]

Remote work has become increasingly popular among younger workforce who want greater flexibility to meet workforce requirements.[M] Remote work benefits employees in saving time and money through fewer commutes, increased productivity, and flexibility to meet family obligations (Figure 1).

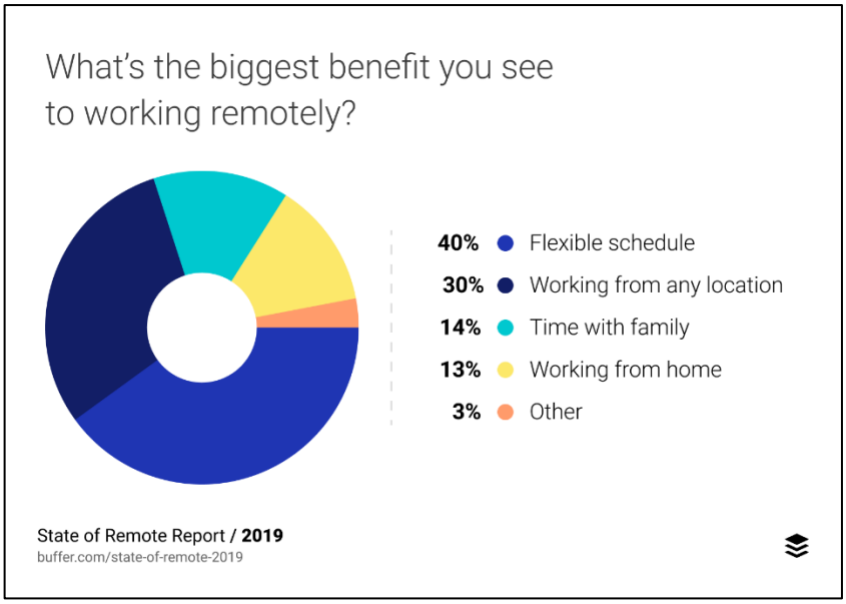


Figure 1: Benefits of Remote Work. Source: Buffer

Additionally, remote work has benefits for employers through reduced overhead costs, attracting and retaining talent, boosting employee morale and productivity, and improving company culture.[H] Employers have found that technology is breaking down borders and allowing companies to hire the best team members, wherever they live. [M] As talent within the workforce is becoming increasingly competitive, companies are finding that allowing employees to work remotely will help recruiting or retaining talent.[M]

The federal government continues to make progress in remote work opportunities. A recent report to Congress reports considerable progress in meeting telework participation goals, with 64% of Federal agencies meeting at least one participation goal set for fiscal year 2017, an increase of over 4% from 2016. [H] The federal government continues to see improved employee attitude, better emergency preparedness, higher recruiting, greater retention, improved employee performance, and reduced real estate costs among the benefits of increased remote work opportunities. [H]

In some instances, companies are seeing decreased collaboration among employees and decreased innovation among remote workforces. This has caused a trend in reducing remote work opportunities for some employees. Reports have shown that though 80% - 90% of the US workforce say they would like to telework at least part-time (1-2 days per week) many employers are requiring 1-2 days at the office to balance the growing need for collaborative work and face-to-face communication.[H]

Analytic Confidence

The analytic confidence for this estimate is moderate. The reliability of the sources is moderate to high and all tended to corroborate one another with some dissenting opinions. There was adequate time, but the analyst worked alone and did not use a structured method. The estimates contained within the sources are good, but given the length of time frame of the estimate, this report is sensitive to changes in technological conditions and changes in legislation associated with the workforce.

Author: Steven M. Clark

Highly probable technological advancements in artificial intelligence, machine learning will bring scientific validity, reliability to recruiting

Executive Summary

Due to technological advancements in artificial intelligence (AI) and machine learning (ML), it is *highly probable* that valid and reliable self-learning systems will transform how organizations acquire talent. Despite the cost, complexity, constraints of small data sets, and concerns regarding the ethically and socially appropriate use of data, recruiters in large organizations will *likely* use AI and ML to reliably identify and recruit qualified candidates.

Discussion

AI and ML technology are changing the landscape of business including human resources. "In the talent industry, AI has already become more common with the use of soft skill assessment tools and chatbots. And, according to Przemek Berendt, VP of Global Marketing at technology service provider, Luxoft, there's a lot more to come."[M]

Combining AI and ML into talent acquisition is transforming how businesses recruit new talent. According to Peter Cappelli, "Machine learning models have the potential to find important but previously unconsidered relationships."[M] Both AI and ML provide opportunities that allow businesses to screen applicants with great fidelity and confidence that the recruits will perform and embrace the culture of an organization. Chatbots, natural language processing and skill matching algorithms are technologies that have been developed in the last several years. IBM is incorporating these technologies into their recruiting. According to Amber Grewal, Vice President Global Talent Acquisition, "Overall, this is a story about data providing you with exponential learning opportunities and better decision-making capabilities. In talent acquisition at IBM, incorporating AI into the recruiting and sourcing functions augments our recruiters' ability to make better decisions that drives more business value."[M]

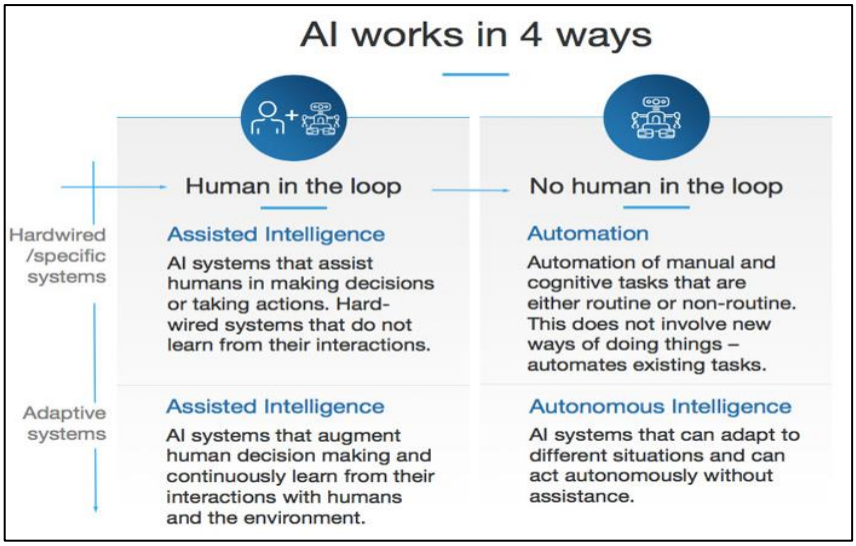


Figure 1. How AI Works Source: LinkedIn

As appealing as AI and ML is for the acquisition of talent, they will not replace the human recruiter. As depicted in the attached quad chart, (Figure 1) AI (and ML) should be designed to augment, inform and continuously learn from their interaction with humans and the environment. The human recruiter must leverage information that AI and ML provide but must not acquiesce the talent acquisition decision to these technologies.

Despite the appealing benefits of AI and ML there are several concerns informing the acquisition of talent: 1) The cost of developing a system that informs recruiters of the type of talent required for the Army of 2035 will be daunting in dollars and in man-hours. 2) The complexity of the system to identify what truly makes a good cyber versus a good engineer Soldier is inherently complex and will take years of compiling data to inform both the broad and subtle differences. Which leads to the next issue; 3) Constraints by small data sets. To be effective, the incorporation of AI and ML into an acquisition system requires substantial amounts of data over several years. 4) The final concern is the appropriate ethical and social use of data. What, how, where and the method of collecting data have ethical and social concerns. The drive for efficiency and concerns about fairness do not always align. [H]

Analytic Confidence

The analytic confidence for this estimate is high. The reliability of the sources is high. The sources and accompanied analysis all tended to corroborate each other irrespective of location in the world. There was adequate time and the task was not complex.

Author: Martin D. Lepak

Appendices

Appendix A: Terms of Reference

Terms of Reference:
Skills Matching and Required Talent Management System (SMaRTS)

For:

Honorable E. Casey Wardynski
Assistant Secretary of Army for Manpower and Reserve Affairs

By:

USAWC Futures - People

22 November 2019

Terms of Reference:
Skills Matching and Required Talent Management System (SMaRTS)

Requirement:

What will a system that informs and enables the acquisition, development, retention, and employment of the right talent and skills to meet Army personnel requirements in 2035 likely look like? Specifically what are the likely elements of a talent based approach that will both reveal market[1] requirements while meeting Army demands in relative real-time and provide feedback through a self-learning system.

Additionally, what legislative, procedural and cultural impediments likely stand in the way of an agile system that allows the Army to adapt to these new demands through acquisition avenues or modification to the development of current Army's existing talent?

Methodology:

In general, the team will conduct extensive research into the future of work within the government and private sector. Through comparative case study examinations, we will determine how leading-edge corporations are developing their talent management systems to meet human capital requirements. In conjunction with that effort, we intend to identify the attributes of a personnel system to match knowledge, skills, behaviors, and preferences with personnel requirements driven by key stakeholders within the future force. Research conducted through multiple means to include, but not limited to, data collection from open source outlets, interviews with senior Army leaders, industry human resource professionals, and commercial sector leaders, and examination of academic studies and research.

Step 1: Data collection (October-December 2019). We will explore what the future environment might look like within the personnel enterprise from multiple open source outlets and associated interviews to answer the overarching questions. Examples might include research of the future of work as it relates to government and civilian employment, best and emerging practices within human resourcing, drivers of education and training sectors to meet demands, etc.

- Evaluate the expected environment that will drive the innovation required to match personnel skills with employment requirements within private and governmental careers/jobs.
- Evaluate existing skill matching resources (Fiverr, LinkedIn, Indeed, The Ladders, Glassdoor, etc.) to see how effective their algorithms are at matching skills sought within the civilian sector to developing personnel requirements.

[1] By 'market requirements/demands' we mean an approach which both knows what the Army needs at any particular time as well as understands what the demand for that same skill is in the broader economy.

- Assess the potential future of conflict and the environment in which the Army expects to “deploy, fight, and win”.
- Evaluate other All Volunteer Forces talent management systems to see if there are any lessons learned that may drive personnel or skill requirements.

Step 2: Synthesize (January – February 2020). We will evaluate and collate the information discovered in an attempt to reveal how the future environment may affect the Army’s personnel enterprise.

- Evaluate research findings for environmental, personnel, resource, or bureaucracy trends that provide greater insight to future KSB-P requirements for the Army of the future.
- Determine which potential technologies, personnel policies, or manning solutions could work within the construct of the US Army.
- Identify and evaluate cultural barriers within the Army to adoption of the requirements matching process and provide recommendations on how to overcome those barriers.

Step 3: Compile concepts and prepare report (March 2020)

- Examine and evaluate predictions within the operating environment as it pertains to the people enterprise in creating a roadmap to catalog and measure the skills required for the US Army of the future.
- Examine and evaluate what methods the Army should implement, within the Army’s culture, to inform the acquisition, development, retention, and employment of the right talent and skills to meet Army personnel requirements.
- Compile a comprehensive report that includes the team’s finding, outcomes, barriers, and recommendations for implementation to the Army’s Future People Strategy.

Step 4: Outbrief to Dr. Wardynski and his team (April 2020)

Challenges:

- The timeline and scope of this project is large given the other Army War College requirements for the team given the uncharted territory of this project within the People Enterprise.
- Acquisition of funding for any travel for in-person research or interviews of subject matter experts presents challenges with gathering of information. The team will use commercial telephonic and video-telephonic interviews as much as possible to mitigate any funding limitations.
- Currently unknown amount of information on this topic as we explore the future environment and potential requirements for the next generation of workers.

- Cognitive biases of career military Army Officers, across multiple components, may influence our ability to identify alternative solutions.
- Limited expertise on the development of statistical models associated with the People Enterprise; we will attempt to leverage other resources to overcome any limitations.
- Unknowable future may lead to unknowable requirements; we will attempt to get the Army “closer” to solving the problem of matching requirements with the knowledge and skills required to meet future unknown requirements.

Resources:

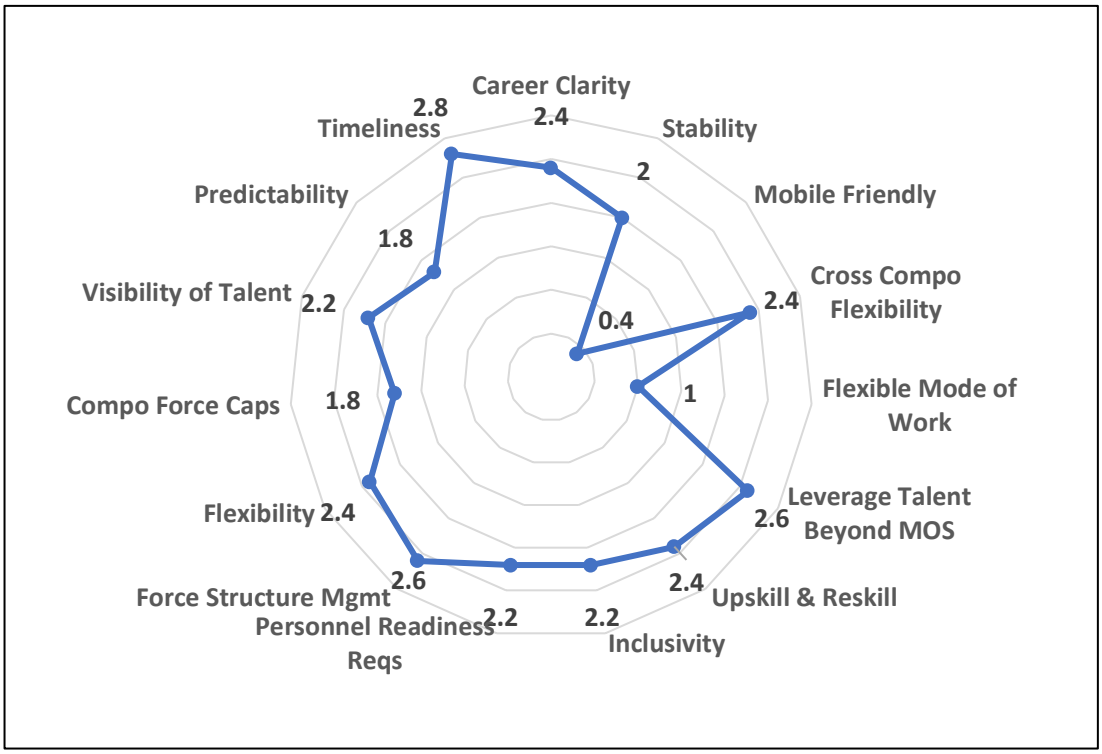
- The team will utilize United States Army War College databases and resources along with other commercially and educational resources available.
- The team will identify and seek out subject matter experts within the Department of Defense and private sector for interviews, best practices, and environmental factors that can provide insight into future personnel requirements.
- The team will work with the current Army Talent Management team to identify overlapping areas of interest, current and future policies and procedures, and constraints or limitations to future manning skills and requirements.
- The team will utilize open source media to gather insight into the future environment.
- The team will leverage personal and professional relationships in the pursuit of information.
- The team is comprised of multi-component Army officers with unique and varied background and made of five members:
  - Active Army Medical Service Corps Officer with a background in medical logistics, hospital administration, and supply chain management.
  - Georgia Army National Guard Infantry Officer with a background in operations, plans, DSCA, and CBRNe Response Enterprise.
  - Active Army Military Police officer with previous experience in all three components (active, ARNG, and USAR)
  - USAR AGR Engineer Officer with construction and deconstruction project management experience, operations, plans (Company to Corps level) and ROTC recruiting, instructing and leading (both APMS and PMS).
  - Active Army Multi-Functional Logistics Officer with experience in operational planning and execution (division and below), leader development, project management, Army Capability Development, collective training development and management, higher and post-secondary education, and ROTC recruiting, instruction, leading, and operations as a Professor of Military Science.

Administration:

- Final product submission to Dr. Wardynski and his team in Spring 2020 (late-March/early-April)
- The Talent Management for 2035 team's, central point of contact is:
  - John Urciuoli, john.urciuoli@armywarcollege.edu; 910-286-4270
- Alternate Points of contact are:
  - Vincent Amerena, vincent.amerena@armywarcollege.edu; 781-420-4892
  - Steven Clark, steven.clark@armywarcollege.edu; 760-887-7424
  - Andrew Heymann, andrew.heymann@armywarcollege.edu ; 770-820-8302
  - Marty Lepak, martin.lepak@armywarcollege.edu; 517-256-5285

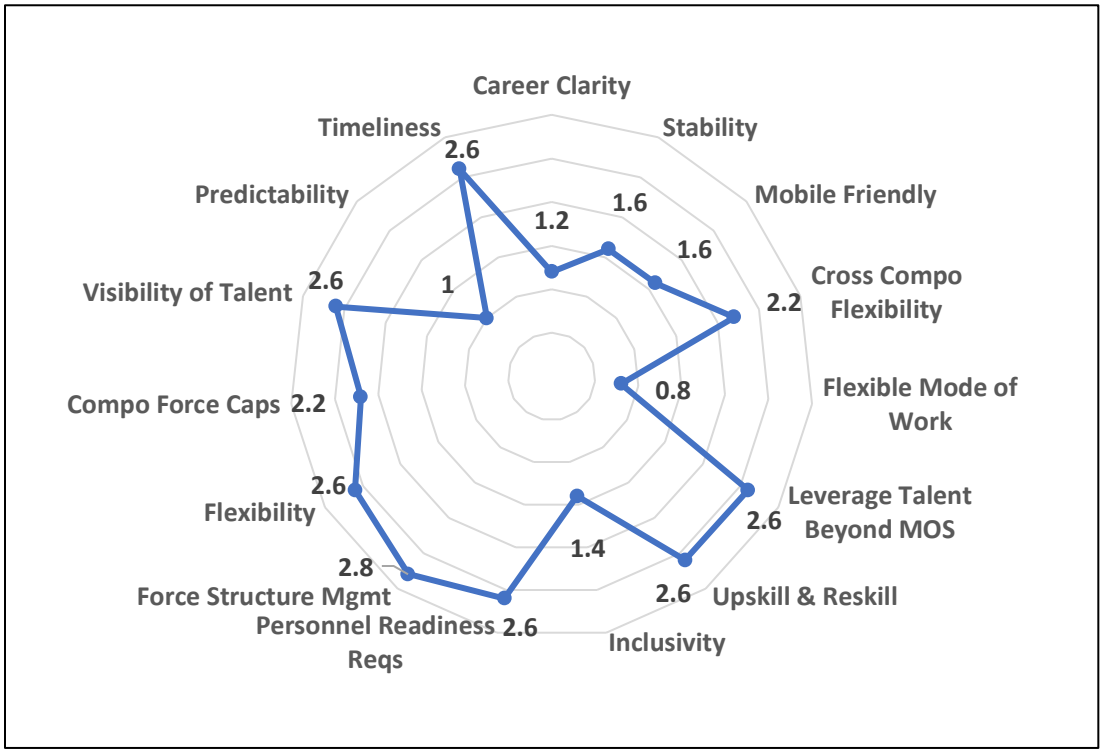
Appendix B: Supporting Research Radar Charts

Self-Learning System: Impact on the Essential Conditions of the Army and Talent



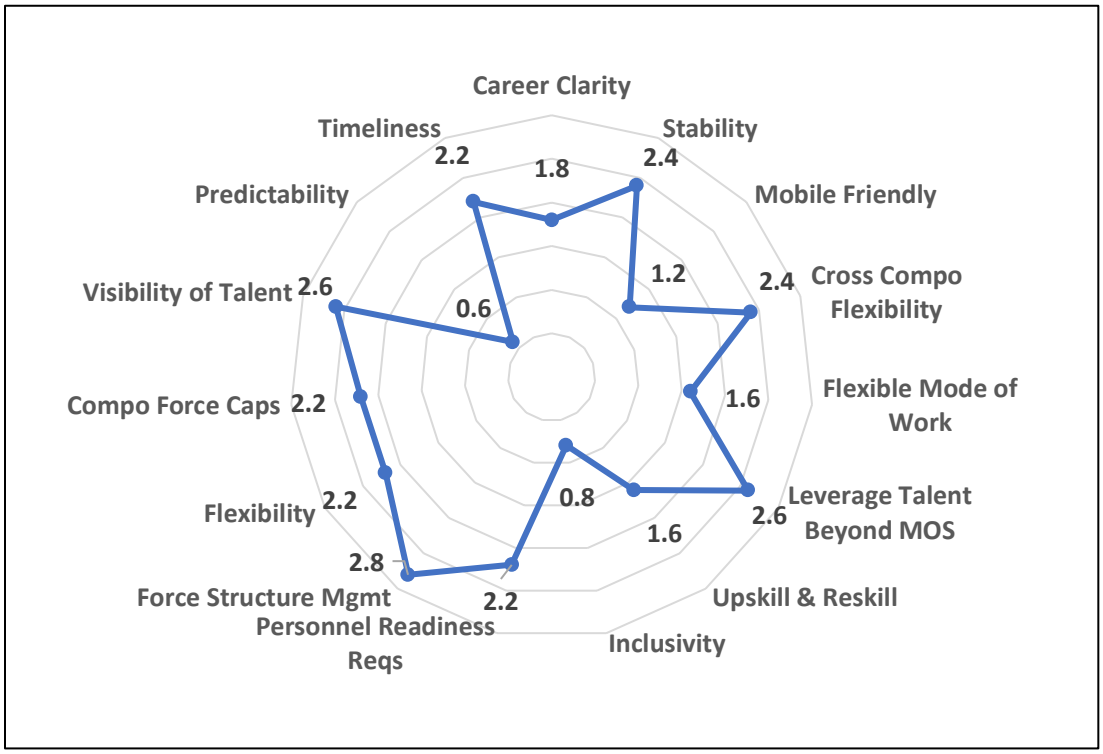
Essential Condition	Score
Timeliness	2.8
Leverage Talent Beyond MOS	2.6
Force Structure Mgmt	2.6
Career Clarity	2.4
Cross Compo Flexibility	2.4
Upskill & Reskill	2.4
Flexibility	2.4
Inclusivity	2.2
Personnel Readiness Reqs	2.2
Visibility of Talent	2.2
Stability	2
Compo Force Caps	1.8
Predictability	1.8
Flexible Mode of Work	1
Mobile Friendly	0.4

Total Force Visibility: Impact on the Essential Conditions of the Army and Talent



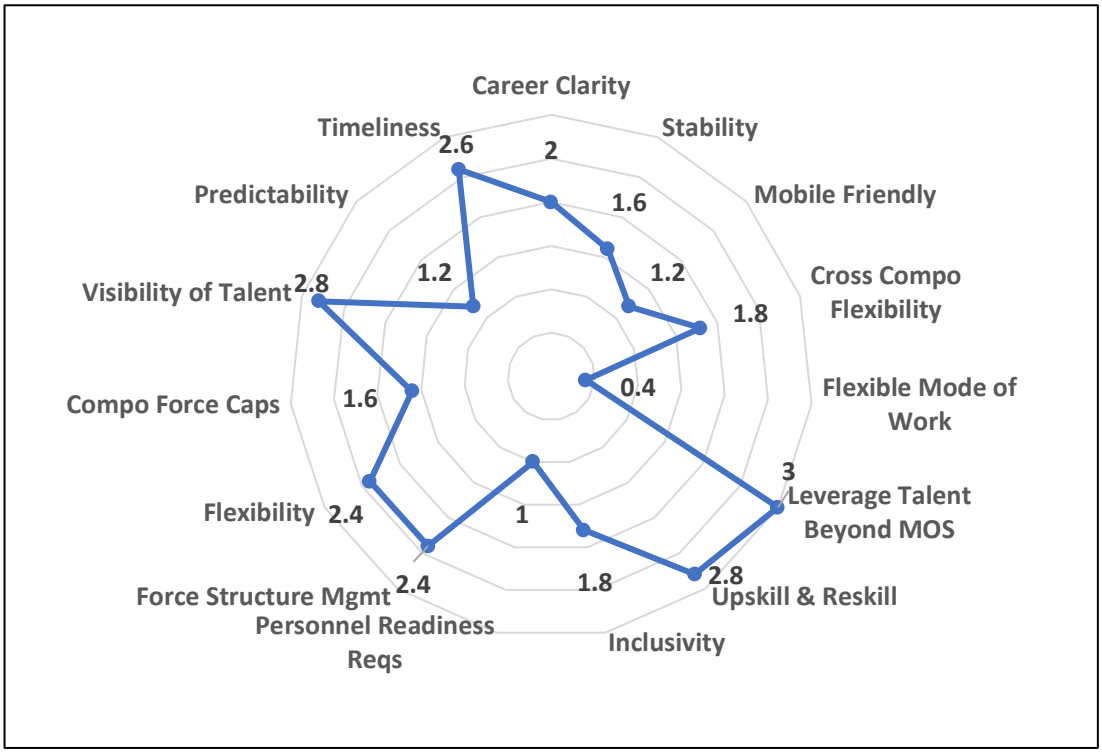
Essential Condition	Score
Force Structure Mgmt	2.8
Leverage Talent Beyond MOS	2.6
Upskill & Reskill	2.6
Personnel Readiness Reqs	2.6
Flexibility	2.6
Visibility of Talent	2.6
Timeliness	2.6
Cross Compo Flexibility	2.2
Compo Force Caps	2.2
Stability	1.6
Mobile Friendly	1.6
Inclusivity	1.4
Career Clarity	1.2
Predictability	1
Flexible Mode of Work	0.8

Expandable Access to Personnel Inventory Across the DOD: Impact on the Essential Conditions of the Army and Talent



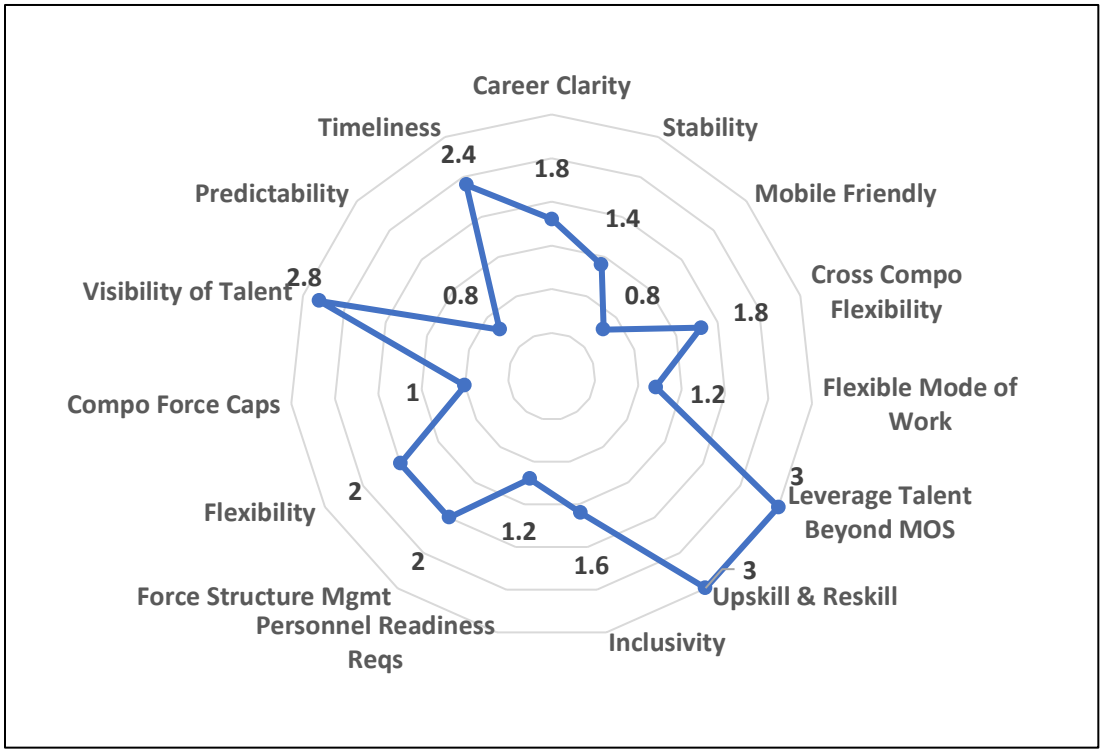
Essential Condition	Score
Force Structure Mgmt	2.8
Leverage Talent Beyond MOS	2.6
Visibility of Talent	2.6
Stability	2.4
Cross Compo Flexibility	2.4
Personnel Readiness Reqs	2.2
Flexibility	2.2
Compo Force Caps	2.2
Timeliness	2.2
Career Clarity	1.8
Flexible Mode of Work	1.6
Upskill & Reskill	1.6
Mobile Friendly	1.2
Inclusivity	0.8
Predictability	0.6

Identify Knowledge, Skills, Behaviors, and Preferences (KSB-P): Impact on the Essential Conditions of the Army and Talent



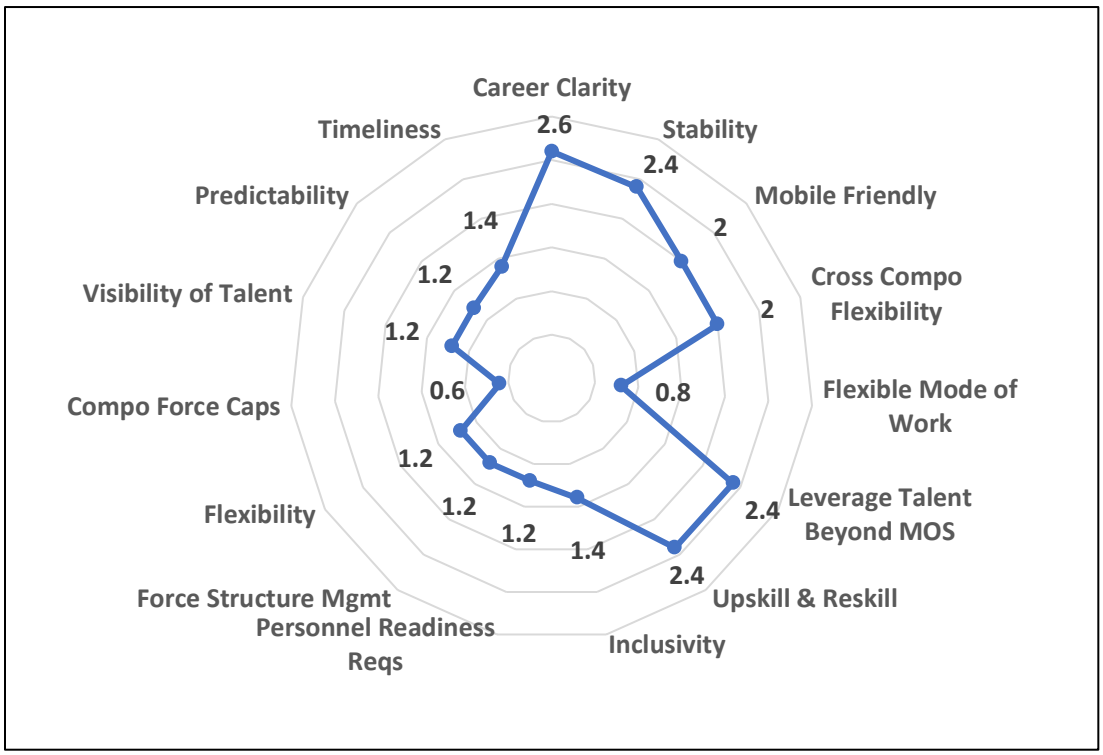
Essential Condition	Score
Leverage Talent Beyond MOS	3
Upskill & Reskill	2.8
Visibility of Talent	2.8
Timeliness	2.6
Force Structure Mgmt	2.4
Flexibility	2.4
Career Clarity	2
Cross Compo Flexibility	1.8
Inclusivity	1.8
Stability	1.6
Compo Force Caps	1.6
Mobile Friendly	1.2
Predictability	1.2
Personnel Readiness Reqs	1
Flexible Mode of Work	0.4

Identify Up-Skilling Requirements to Test and Certify for KSB's: Impact on the Essential Conditions of the Army and Talent



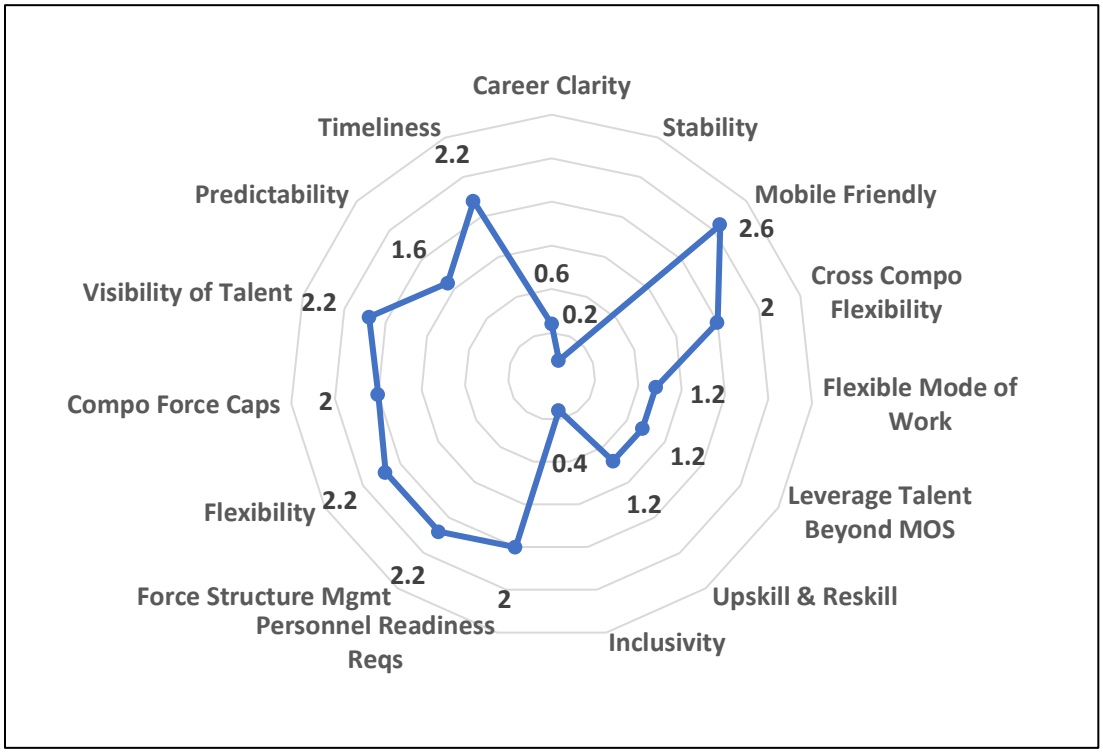
Essential Condition	Score
Leverage Talent Beyond MOS	3
Upskill & Reskill	3
Visibility of Talent	2.8
Timeliness	2.4
Force Structure Mgmt	2
Flexibility	2
Career Clarity	1.8
Cross Compo Flexibility	1.8
Inclusivity	1.6
Stability	1.4
Flexible Mode of Work	1.2
Personnel Readiness Reqs	1.2
Compo Force Caps	1
Mobile Friendly	0.8
Predictability	0.8

Visibility of Total Force Requirements by the Individual: Impact on the Essential Conditions of the Army and Talent



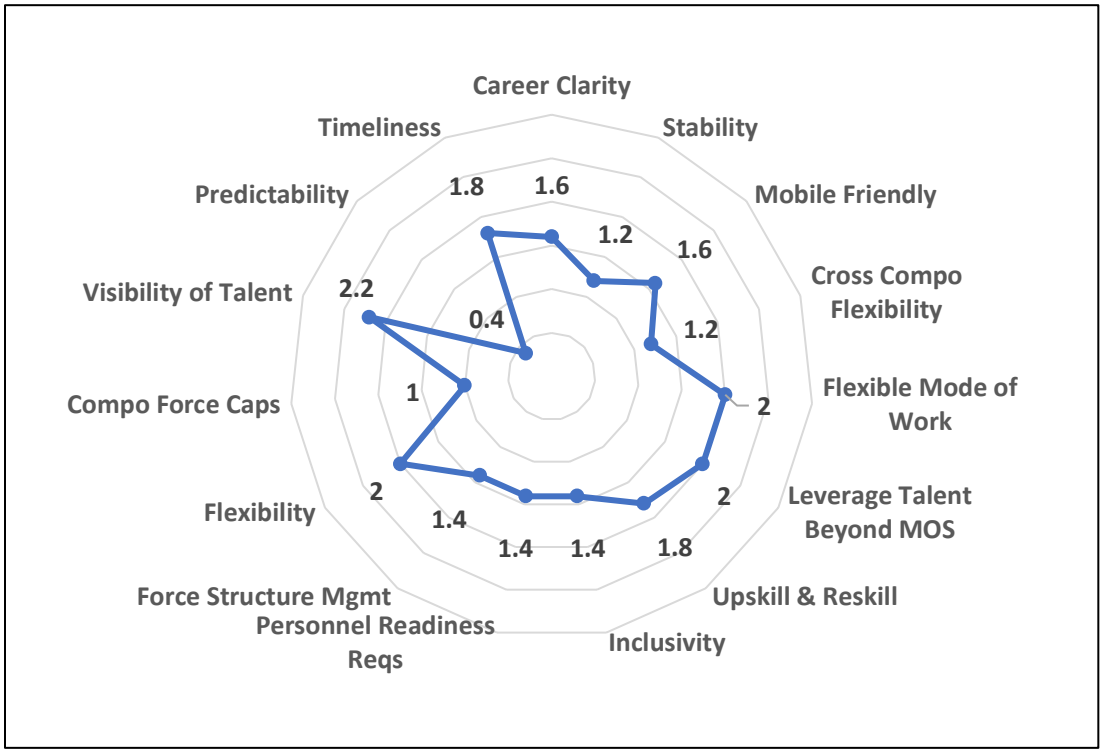
Essential Condition	Score
Career Clarity	2.6
Stability	2.4
Leverage Talent Beyond MOS	2.4
Upskill & Reskill	2.4
Mobile Friendly	2
Cross Compo Flexibility	2
Inclusivity	1.4
Timeliness	1.4
Personnel Readiness Reqs	1.2
Force Structure Mgmt	1.2
Flexibility	1.2
Visibility of Talent	1.2
Predictability	1.2
Flexible Mode of Work	0.8
Compo Force Caps	0.6

Interoperable with Information Systems Across Army Enterprise: Impact on the Essential Conditions of the Army and Talent



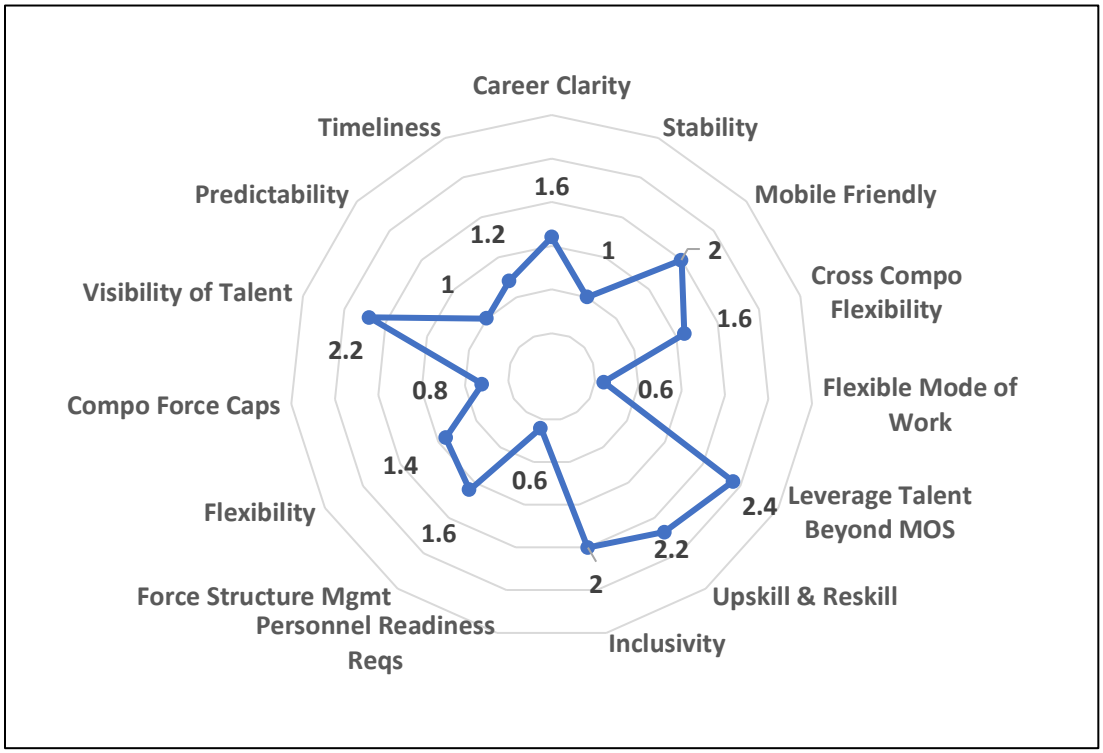
Essential Condition	Score
Mobile Friendly	2.6
Force Structure Mgmt	2.2
Flexibility	2.2
Visibility of Talent	2.2
Timeliness	2.2
Cross Compo Flexibility	2
Personnel Readiness Reqs	2
Compo Force Caps	2
Predictability	1.6
Flexible Mode of Work	1.2
Leverage Talent Beyond MOS	1.2
Upskill & Reskill	1.2
Career Clarity	0.6
Inclusivity	0.4
Stability	0.2

Collaborate with Industry for Talent Acquisition: Impact on the Essential Conditions of the Army and Talent



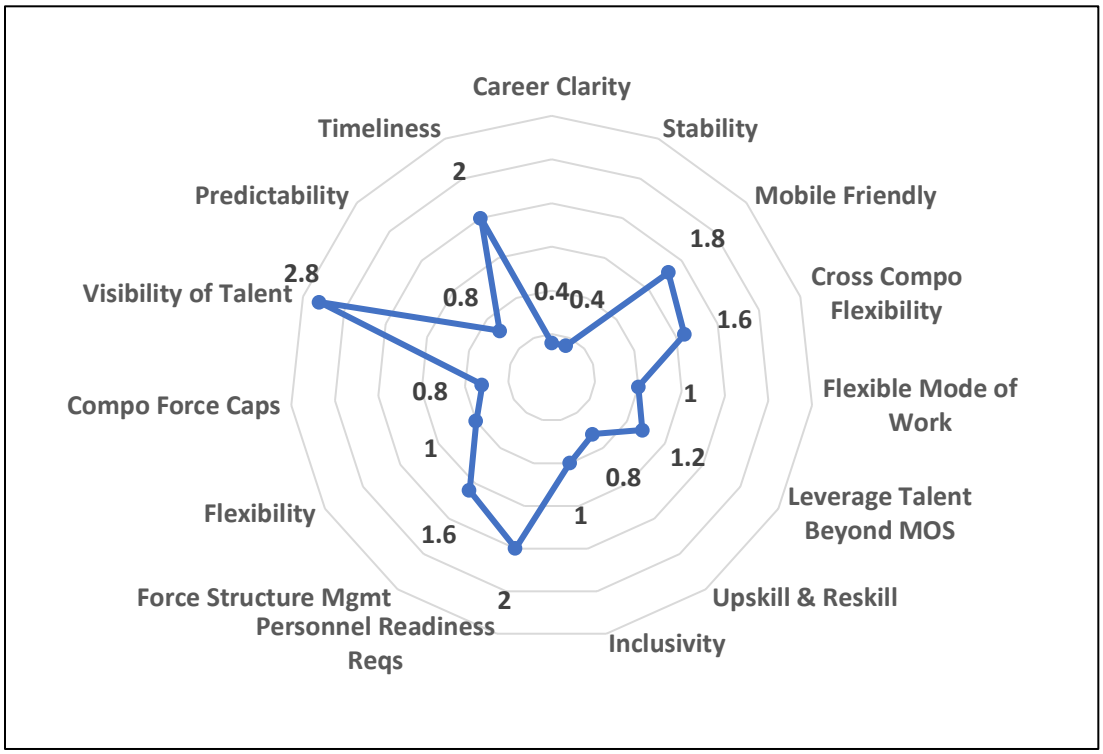
Essential Condition	Score
Visibility of Talent	2.2
Flexible Mode of Work	2
Leverage Talent Beyond MOS	2
Flexibility	2
Upskill & Reskill	1.8
Timeliness	1.8
Career Clarity	1.6
Mobile Friendly	1.6
Inclusivity	1.4
Personnel Readiness Reqs	1.4
Force Structure Mgmt	1.4
Stability	1.2
Cross Compo Flexibility	1.2
Compo Force Caps	1
Predictability	0.4

Use of Natural Language Process Search Capabilities: Impact on the Essential Conditions of the Army and Talent



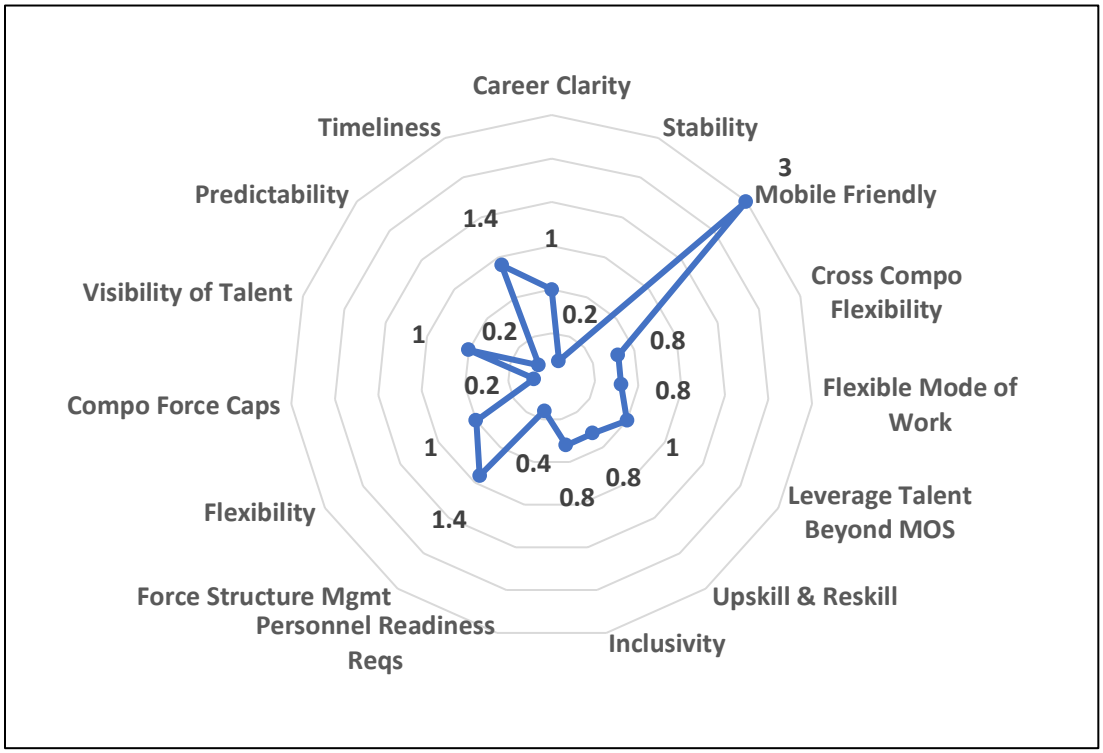
Essential Condition	Score
Leverage Talent Beyond MOS	2.4
Upskill & Reskill	2.2
Visibility of Talent	2.2
Mobile Friendly	2
Inclusivity	2
Career Clarity	1.6
Cross Compo Flexibility	1.6
Force Structure Mgmt	1.6
Flexibility	1.4
Timeliness	1.2
Stability	1
Predictability	1
Compo Force Caps	0.8
Flexible Mode of Work	0.6
Personnel Readiness Reqs	0.6

Appropriate Access to the System: Impact on the Essential Conditions of the Army and Talent



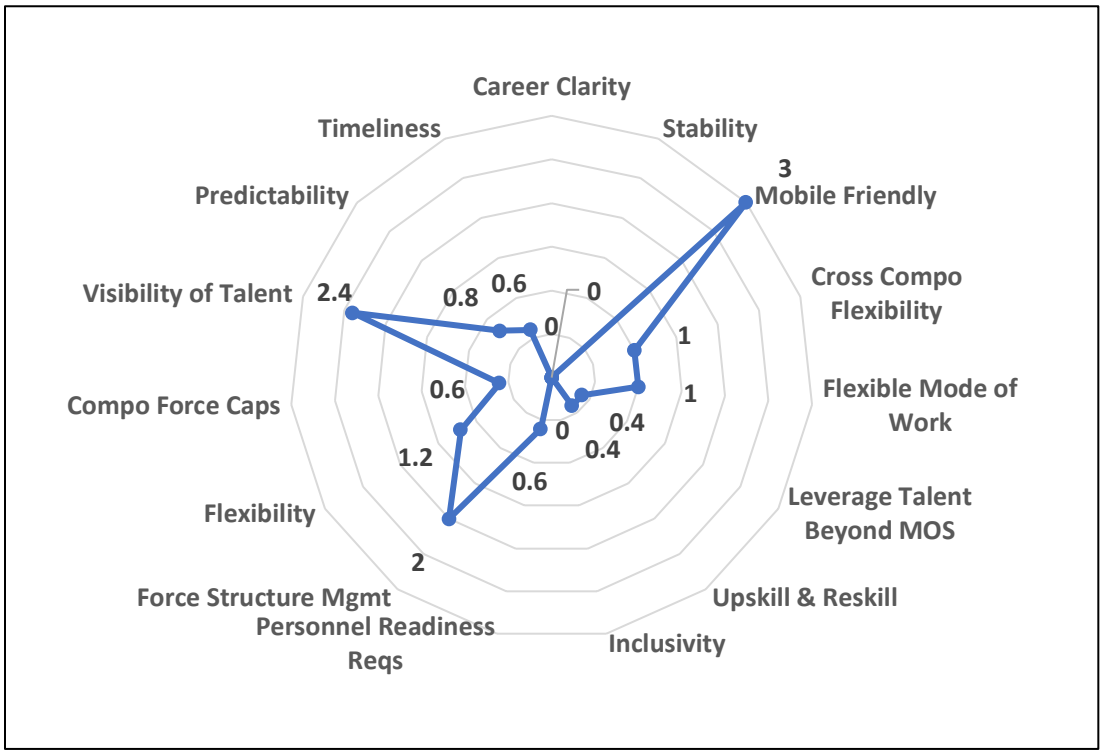
Essential Condition	Score
Visibility of Talent	2.8
Personnel Readiness Reqs	2
Timeliness	2
Mobile Friendly	1.8
Cross Compo Flexibility	1.6
Force Structure Mgmt	1.6
Leverage Talent Beyond MOS	1.2
Flexible Mode of Work	1
Inclusivity	1
Flexibility	1
Upskill & Reskill	0.8
Compo Force Caps	0.8
Predictability	0.8
Career Clarity	0.4
Stability	0.4

Push Notifications, Both to the Army and to the Individual: Impact on the Essential Conditions of the Army and Talent



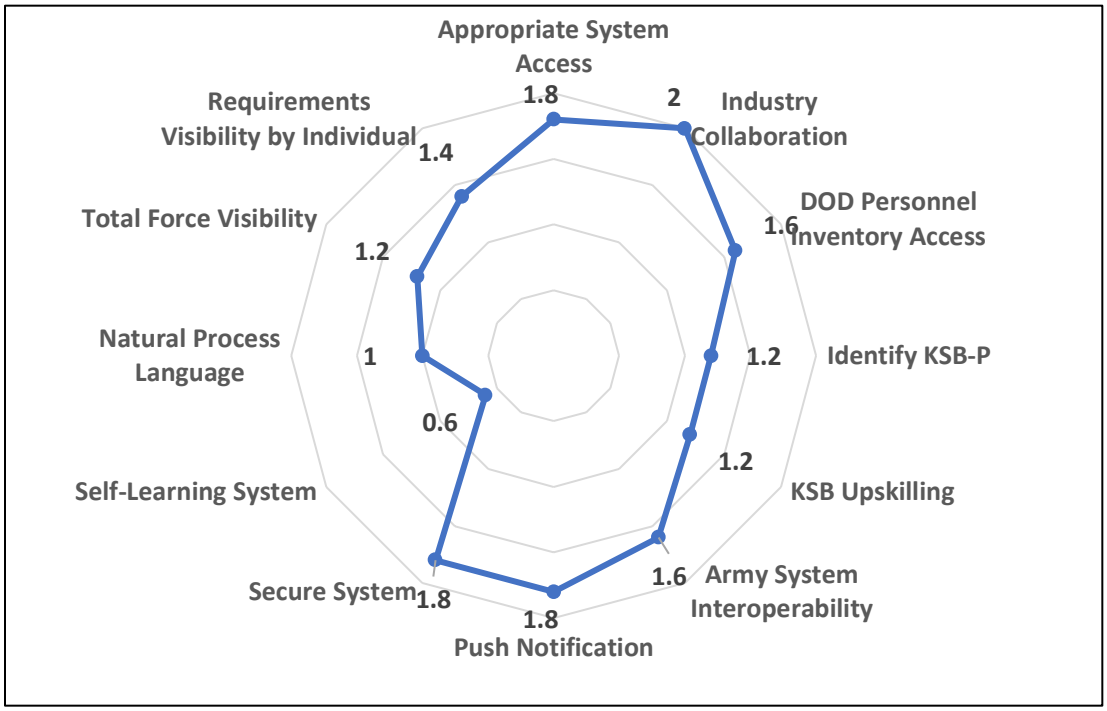
Essential Condition	Score
Mobile Friendly	3
Force Structure Mgmt	1.4
Timeliness	1.4
Career Clarity	1
Leverage Talent Beyond MOS	1
Flexibility	1
Visibility of Talent	1
Cross Compo Flexibility	0.8
Flexible Mode of Work	0.8
Upskill & Reskill	0.8
Inclusivity	0.8
Personnel Readiness Reqs	0.4
Stability	0.2
Compo Force Caps	0.2
Predictability	0.2

Secure System: Impact on the Essential Conditions of the Army and Talent



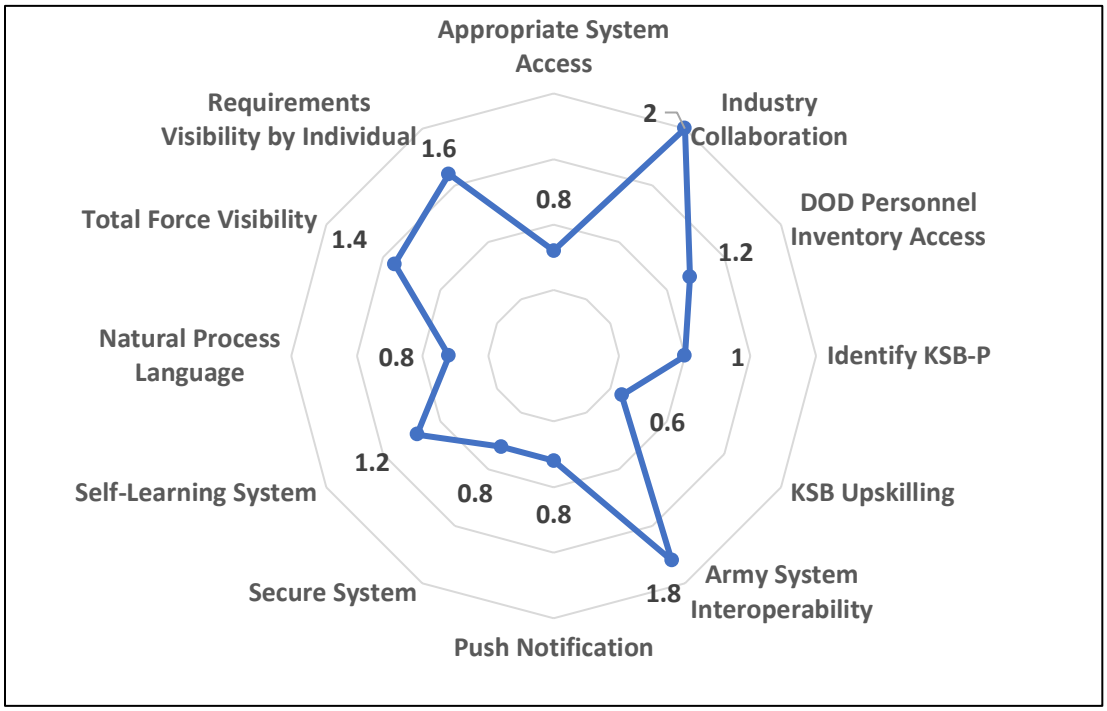
Essential Condition	Score
Mobile Friendly	3
Visibility of Talent	2.4
Force Structure Mgmt	2
Flexibility	1.2
Cross Compo Flexibility	1
Flexible Mode of Work	1
Predictability	0.8
Personnel Readiness Reqs	0.6
Compo Force Caps	0.6
Timeliness	0.6
Leverage Talent Beyond MOS	0.4
Upskill & Reskill	0.4
Career Clarity	0
Stability	0
Inclusivity	0

Mobile Access to Marketplace: Impact on 12 Elements



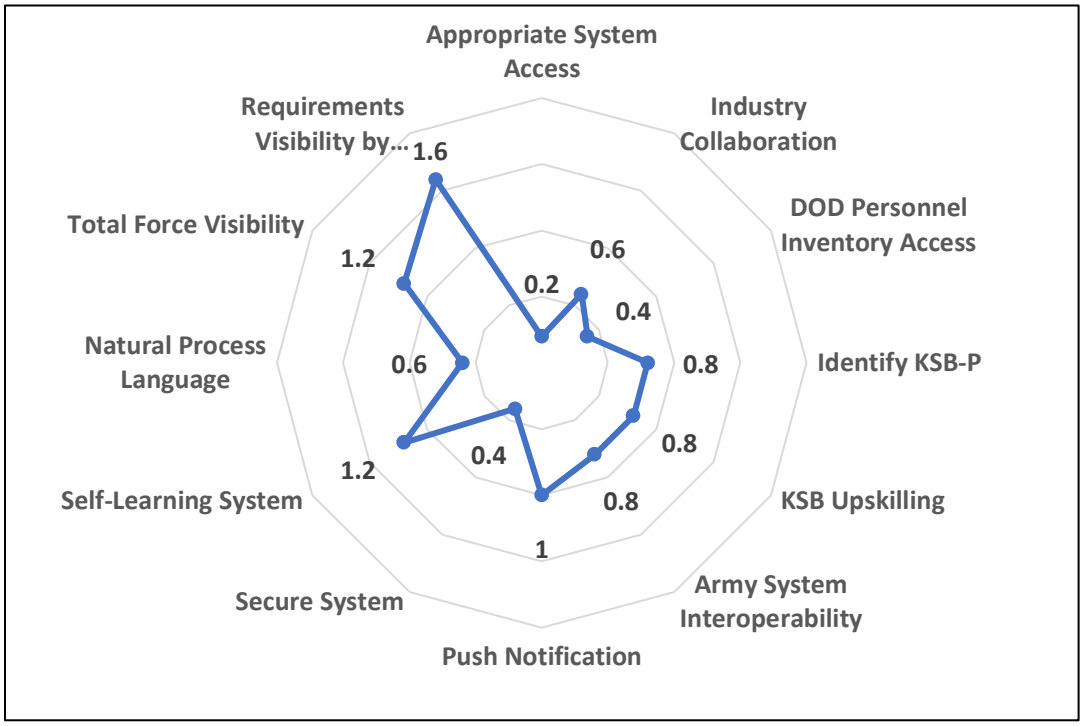
Element	Score
Collaborate with Industry for Talent Acquisition	2
Appropriate Access to the System	1.8
Push Notification, both to Army & Individual	1.8
Secure System	1.8
Expandable Access to Personnel Inventory Across the DOD	1.6
Interoperable with Information Systems Across the Army Enterprise	1.6
Visibility of Total Force Requirements by Individual	1.4
Identify KSB-P	1.2
Identify Upskilling Requirements to Test/Certify for KSBs	1.2
Total Force Visibility	1.2
Use of Natural Process Language Search Capabilities	1
Self-Learning System	0.6

Army Civilian Hiring Practices: Impact on 12 Elements



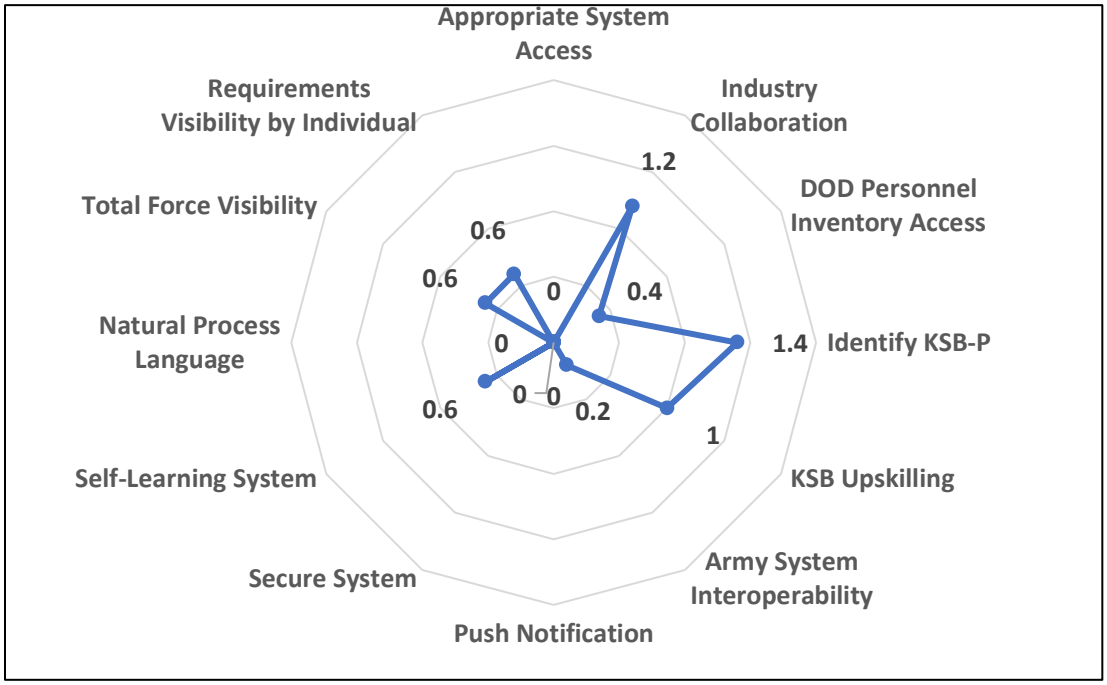
Element	Score
Collaborate with Industry for Talent Acquisition	2
Interoperable with Information Systems Across the Army Enterprise	1.8
Visibility of Total Force Requirements by Individual	1.6
Total Force Visibility	1.4
Expandable Access to Personnel Inventory Across the DOD	1.2
Self-Learning System	1.2
Identify KSB-P	1
Appropriate Access to the System	0.8
Push Notification, both to Army & Individual	0.8
Secure System	0.8
Use of Natural Process Language Search Capabilities	0.8
Identify Upskilling Requirements to Test/Certify for KSBs	0.6

Stability: Impact on 12 Elements



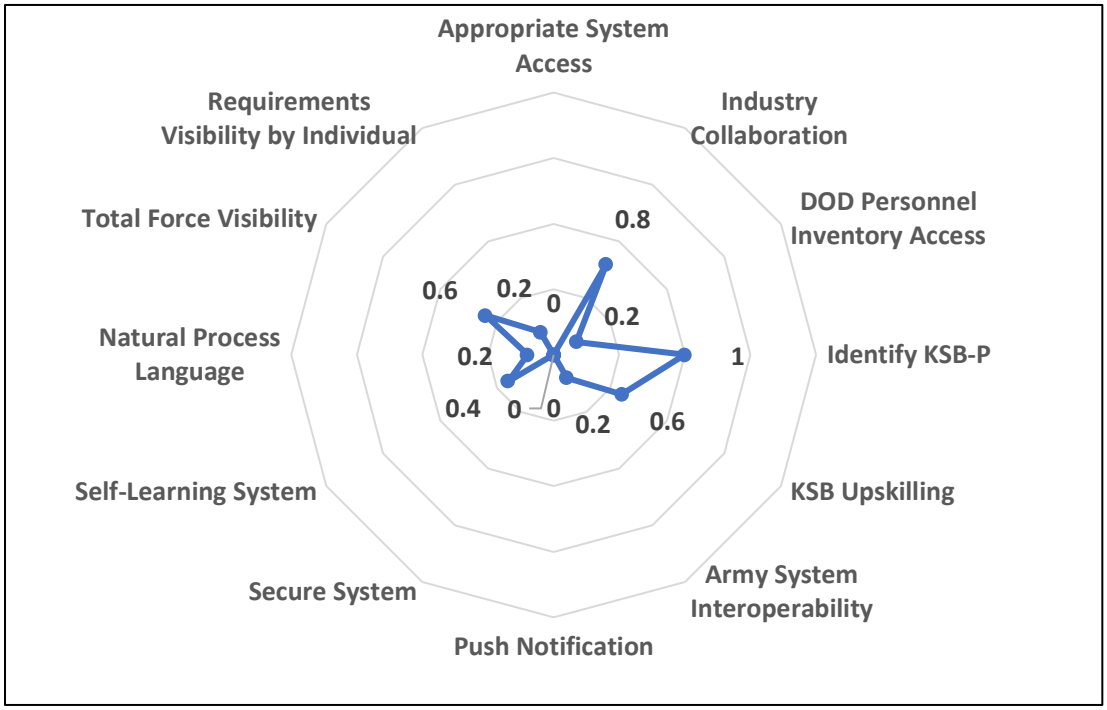
Element	Score
Visibility of Total Force Requirements by Individual	1.6
Self-Learning System	1.2
Visibility of Total Force Available by Army	1.2
Push Notification, both to Army & Individual	1.0
Identify KSB-P	0.8
Identify Upskilling Requirements to Test/Certify for KSBs	0.8
Interoperable with Information Systems Across the Army Enterprise	0.8
Collaborate with Industry for Talent Acquisition	0.6
Use of Natural Process Language Search Capabilities	0.6
Expandable Access to Personnel Inventory Across the DOD	0.4
Secure System	0.4
Appropriate Access to the System	0.2

Military Compensation: Impact on 12 Elements



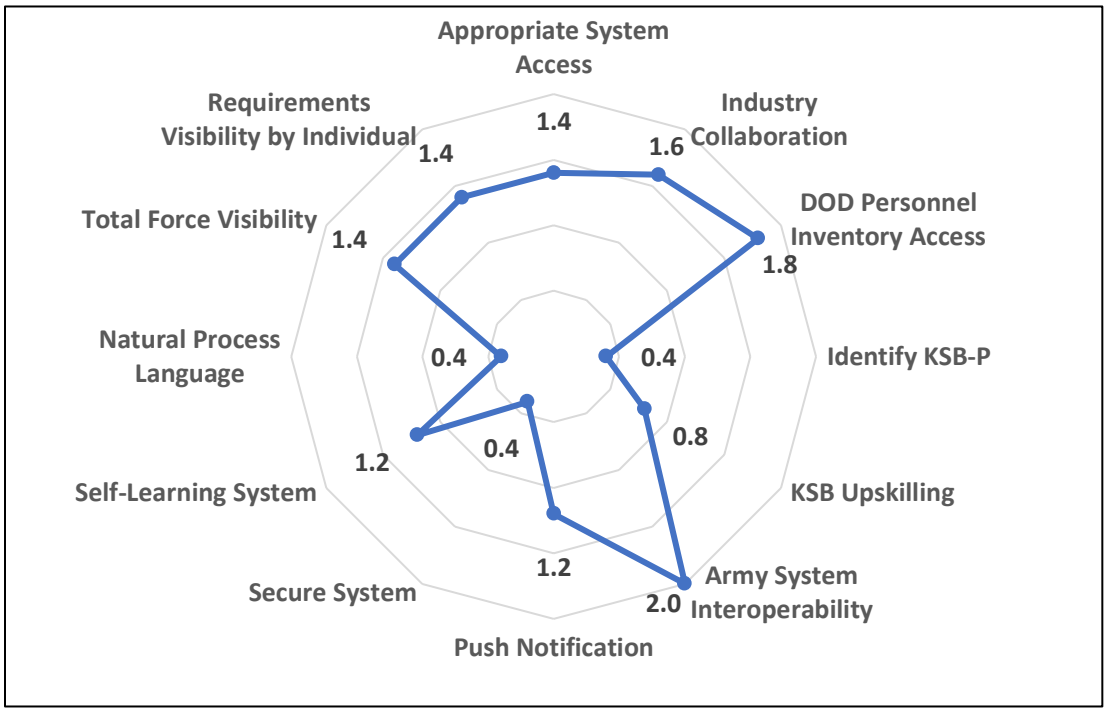
Element	Score
Identify KSB-P	1.4
Collaborate with Industry for Talent Acquisition	1.2
Identify Upskilling Requirements to Test/Certify for KSBs	1.0
Self-Learning System	0.6
Visibility of Total Force Available by Army	0.6
Visibility of Total Force Requirements by Individual	0.6
Expandable Access to Personnel Inventory Across the DOD	0.4
Interoperable with Information Systems Across the Army Enterprise	0.2
Appropriate Access to the System	0.0
Push Notification, both to Army & Individual	0.0
Secure System	0.0
Use of Natural Process Language Search Capabilities	0.0

Physical Requirements: Impact on 12 Elements



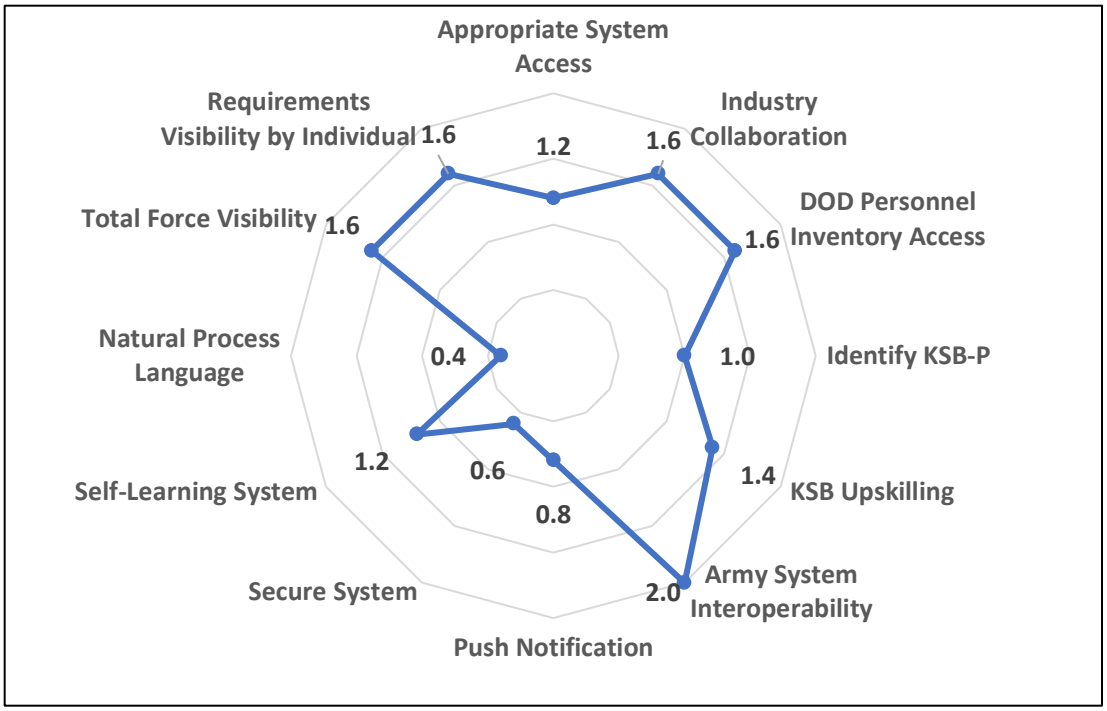
Element	Score
Identify KSB-P	1.0
Collaborate with Industry for Talent Acquisition	0.8
Identify Upskilling Requirements to Test/Certify for KSBs	0.6
Visibility of Total Force Available by Army	0.6
Self-Learning System	0.4
Expandable Access to Personnel Inventory Across the DOD	0.2
Interoperable with Information Systems Across the Army Enterprise	0.2
Use of Natural Process Language Search Capabilities	0.2
Visibility of Total Force Requirements by Individual	0.2
Appropriate Access to the System	0.0
Push Notification, both to Army & Individual	0.0
Secure System	0.0

Bureaucracy: Impact on 12 Elements



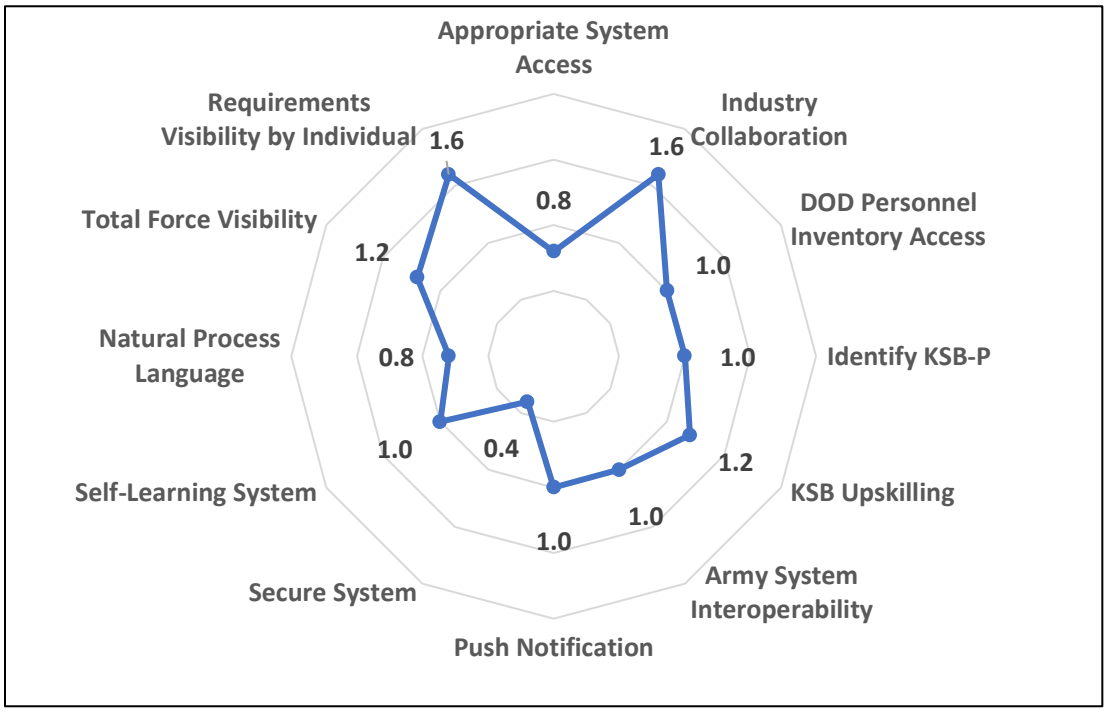
Element	Score
Interoperable with Information Systems Across the Army Enterprise	2.0
Expandable Access to Personnel Inventory Across the DOD	1.8
Collaborate with Industry for Talent Acquisition	1.6
Appropriate Access to the System	1.4
Visibility of Total Force Available by Army	1.4
Visibility of Total Force Requirements by Individual	1.4
Push Notification, both to Army & Individual	1.2
Self-Learning System	1.2
Identify Upskilling Requirements to Test/Certify for KSBs	0.8
Identify KSB-P	0.4
Secure System	0.4
Use of Natural Process Language Search Capabilities	0.4

Unity of Effort: Impact on 12 Elements



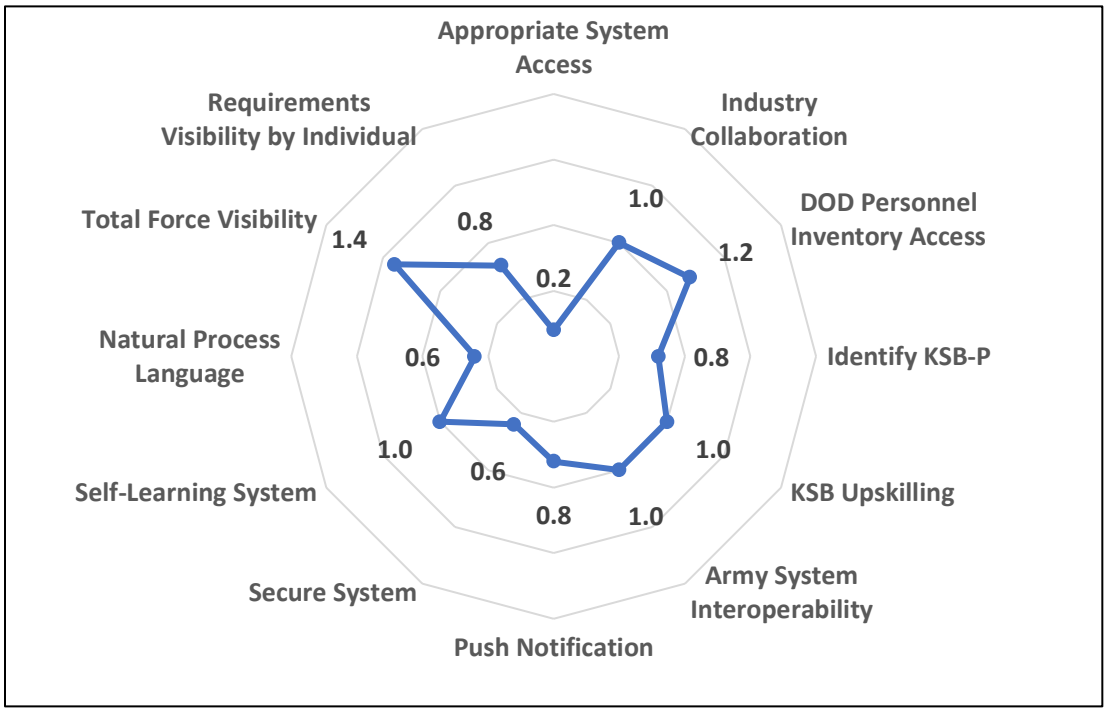
Element	Score
Interoperable with Information Systems Across the Army Enterprise	2.0
Collaborate with Industry for Talent Acquisition	1.6
Expandable Access to Personnel Inventory Across the DOD	1.6
Visibility of Total Force Available by Army	1.6
Visibility of Total Force Requirements by Individual	1.6
Identify Upskilling Requirements to Test/Certify for KSBs	1.4
Appropriate Access to the System	1.2
Self-Learning System	1.2
Identify KSB-P	1.0
Push Notification, both to Army & Individual	0.8
Secure System	0.6
Use of Natural Process Language Search Capabilities	0.4

Culture: Impact on 12 Elements



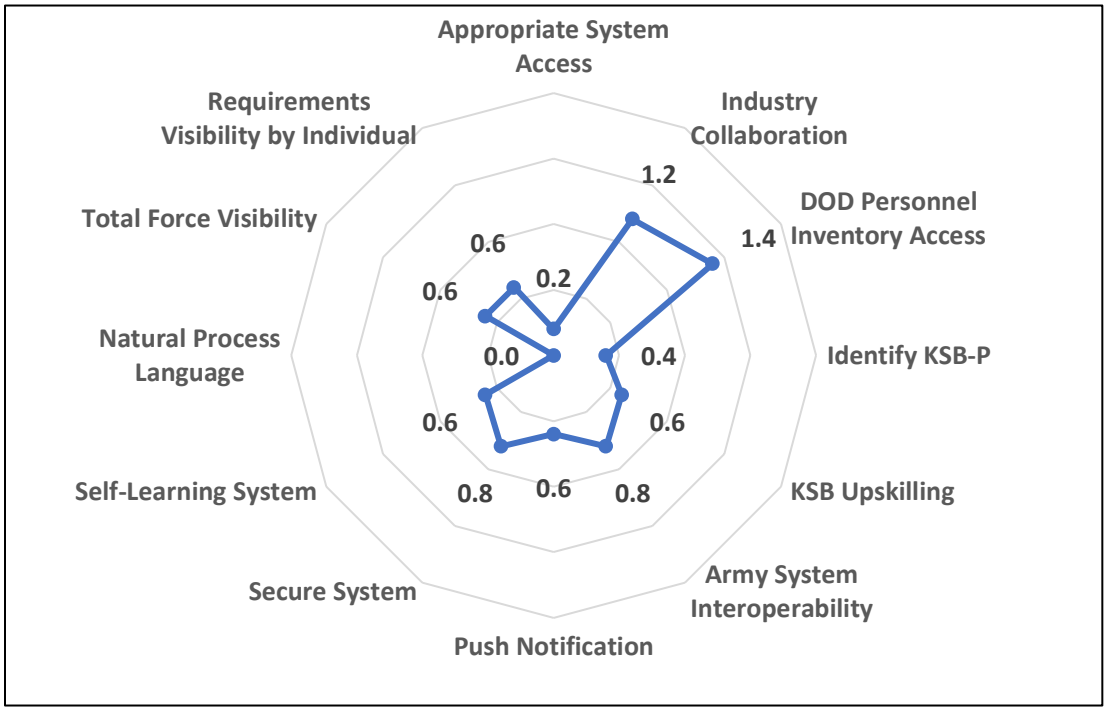
Element	Score
Collaborate with Industry for Talent Acquisition	1.6
Visibility of Total Force Requirements by Individual	1.6
Identify Upskilling Requirements to Test/Certify for KSBs	1.2
Visibility of Total Force Available by Army	1.2
Expandable Access to Personnel Inventory Across the DOD	1.0
Identify KSB-P	1.0
Interoperable with Information Systems Across the Army Enterprise	1.0
Push Notification, both to Army & Individual	1.0
Self-Learning System	1.0
Appropriate Access to the System	0.8
Use of Natural Process Language Search Capabilities	0.8
Secure System	0.4

Immediate Needs of the Army: Impact on 12 Elements



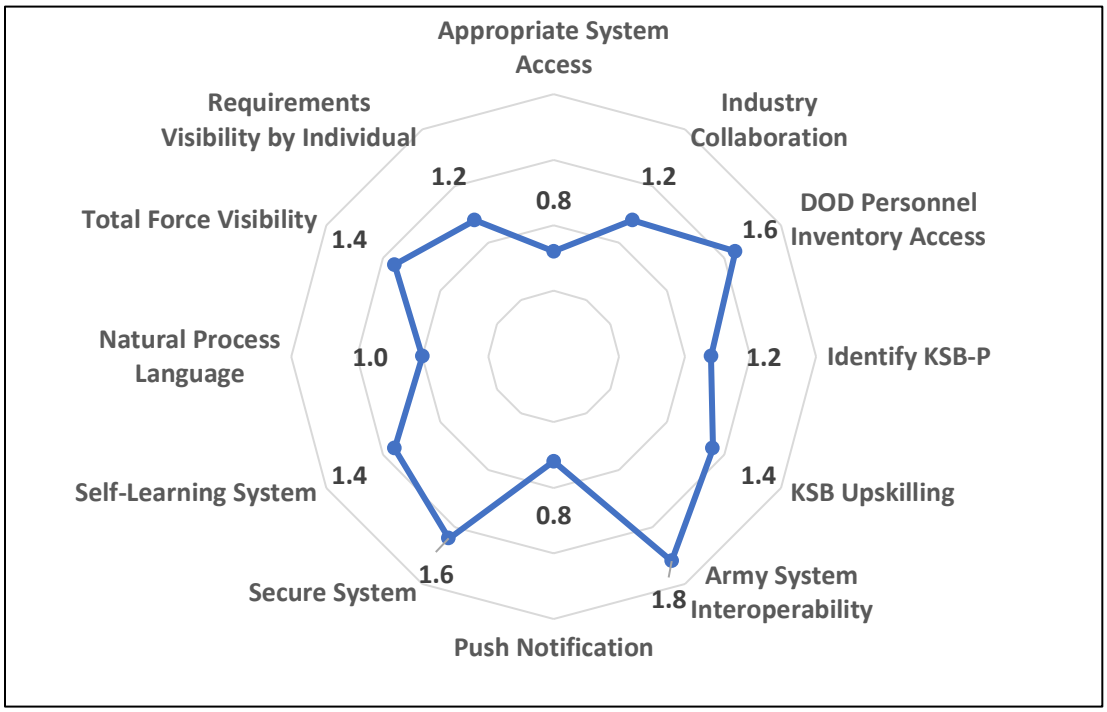
Element	Score
Visibility of Total Force Available by Army	1.4
Expandable Access to Personnel Inventory Across the DOD	1.2
Collaborate with Industry for Talent Acquisition	1.0
Identify Upskilling Requirements to Test/Certify for KSBs	1.0
Interoperable with Information Systems Across the Army Enterprise	1.0
Self-Learning System	1.0
Identify KSB-P	0.8
Push Notification, both to Army & Individual	0.8
Visibility of Total Force Requirements by Individual	0.8
Secure System	0.6
Use of Natural Process Language Search Capabilities	0.6
Appropriate Access to the System	0.2

Existing Statute: Impact on 12 Elements



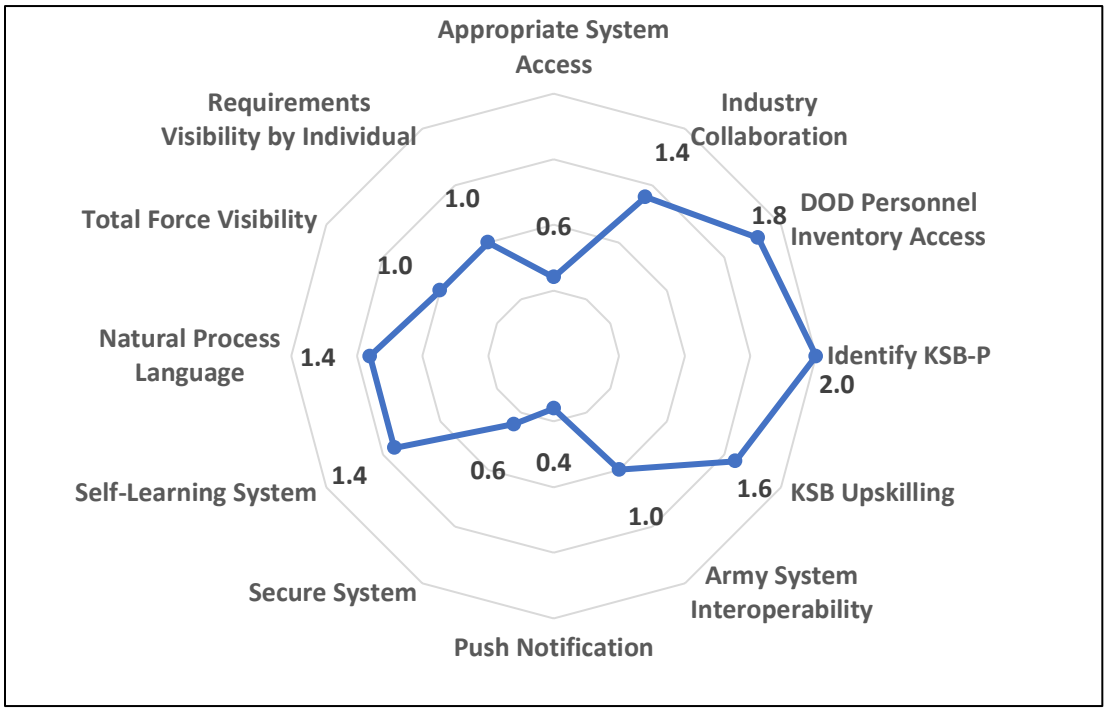
Element	Score
Expandable Access to Personnel Inventory Across the DOD	1.4
Collaborate with Industry for Talent Acquisition	1.2
Interoperable with Information Systems Across the Army Enterprise	0.8
Secure System	0.8
Identify Upskilling Requirements to Test/Certify for KSBs	0.6
Push Notification, both to Army & Individual	0.6
Self-Learning System	0.6
Visibility of Total Force Available by Army	0.6
Visibility of Total Force Requirements by Individual	0.6
Identify KSB-P	0.4
Appropriate Access to the System	0.2
Use of Natural Process Language Search Capabilities	0.0

Big Data Strategy: Impact on 12 Elements



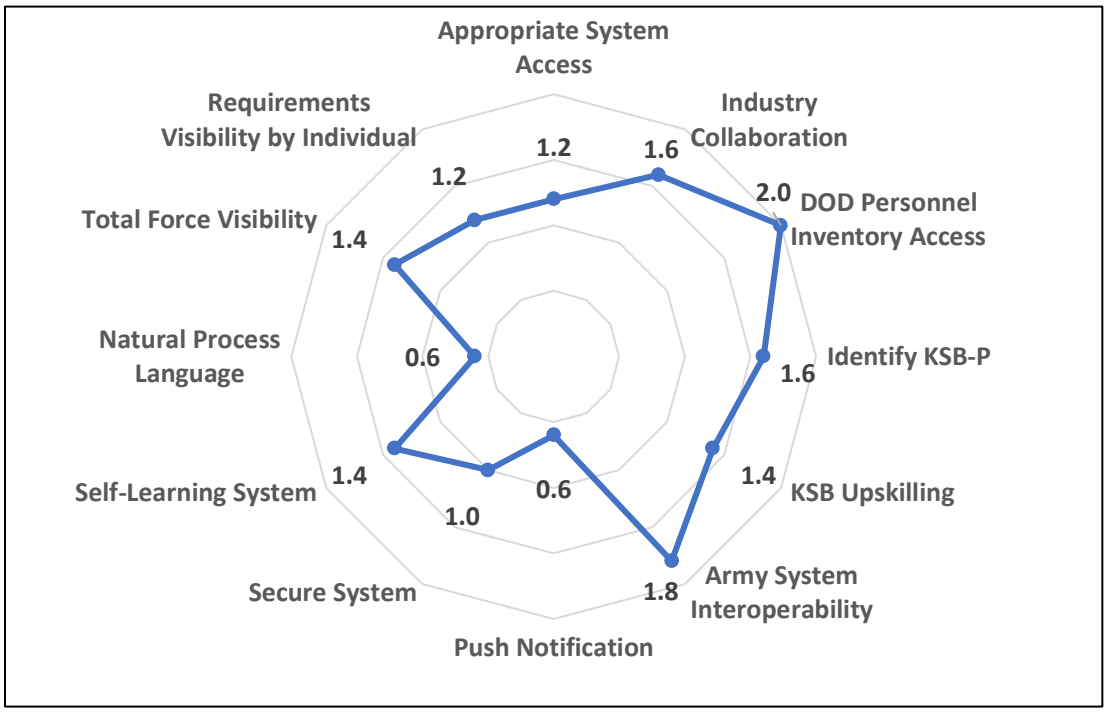
Element	Score
Interoperable with Information Systems Across the Army Enterprise	1.8
Expandable Access to Personnel Inventory Across the DOD	1.6
Secure System	1.6
Identify Upskilling Requirements to Test/Certify for KSBs	1.4
Self-Learning System	1.4
Visibility of Total Force Available by Army	1.4
Collaborate with Industry for Talent Acquisition	1.2
Identify KSB-P	1.2
Visibility of Total Force Requirements by Individual	1.2
Use of Natural Process Language Search Capabilities	1.0
Appropriate Access to the System	0.8
Push Notification, both to Army & Individual	0.8

Information Equilibrium: Impact on 12 Elements



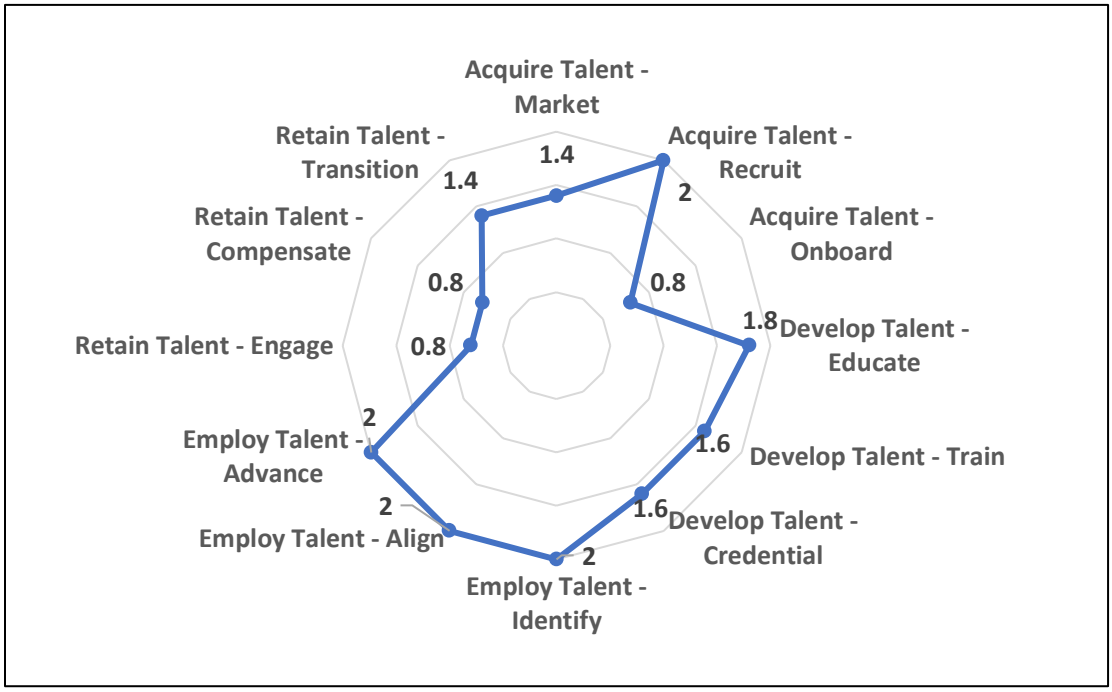
Element	Score
Identify KSB-P	2.0
Expandable Access to Personnel Inventory Across the DOD	1.8
Identify Upskilling Requirements to Test/Certify for KSBs	1.6
Collaborate with Industry for Talent Acquisition	1.4
Self-Learning System	1.4
Use of Natural Process Language Search Capabilities	1.4
Interoperable with Information Systems Across the Army Enterprise	1.0
Visibility of Total Force Available by Army	1.0
Visibility of Total Force Requirements by Individual	1.0
Appropriate Access to the System	0.6
Secure System	0.6
Push Notification, both to Army & Individual	0.4

Agility and Scale: Impact on 12 Elements



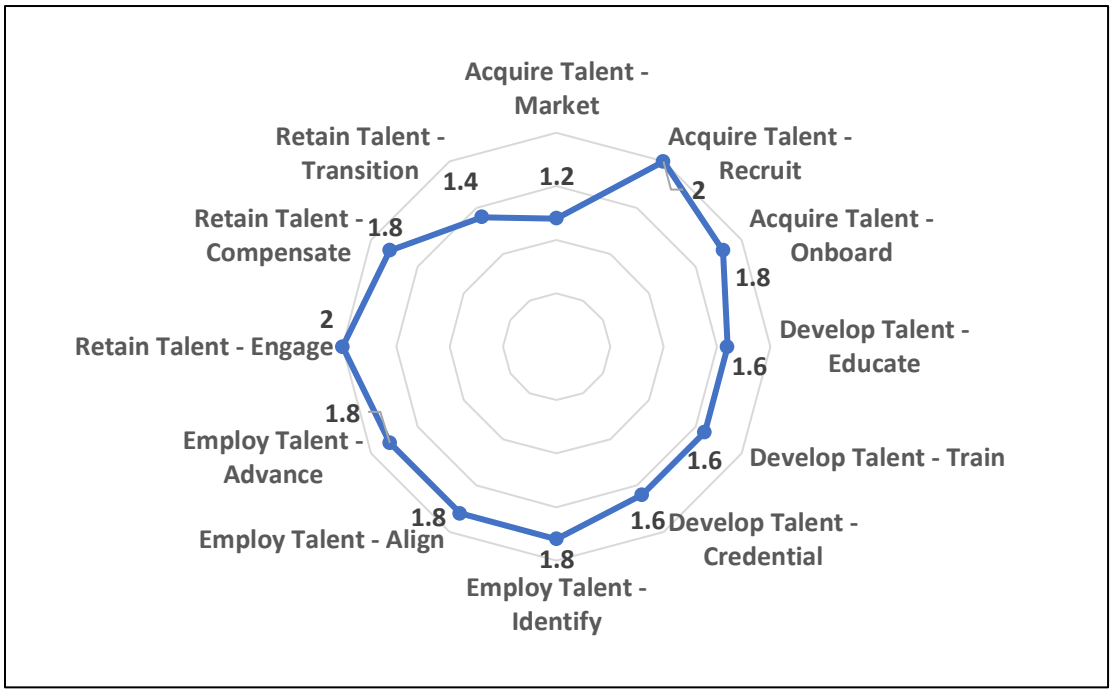
Element	Score
Expandable Access to Personnel Inventory Across the DOD	2.0
Interoperable with Information Systems Across the Army Enterprise	1.8
Collaborate with Industry for Talent Acquisition	1.6
Identify KSB-P	1.6
Identify Upskilling Requirements to Test/Certify for KSBs	1.4
Self-Learning System	1.4
Visibility of Total Force Available by Army	1.4
Appropriate Access to the System	1.2
Visibility of Total Force Requirements by Individual	1.2
Secure System	1.0
Push Notification, both to Army & Individual	0.6
Use of Natural Process Language Search Capabilities	0.6

Self-Learning System: Elements Impact on People Strategy LOEs



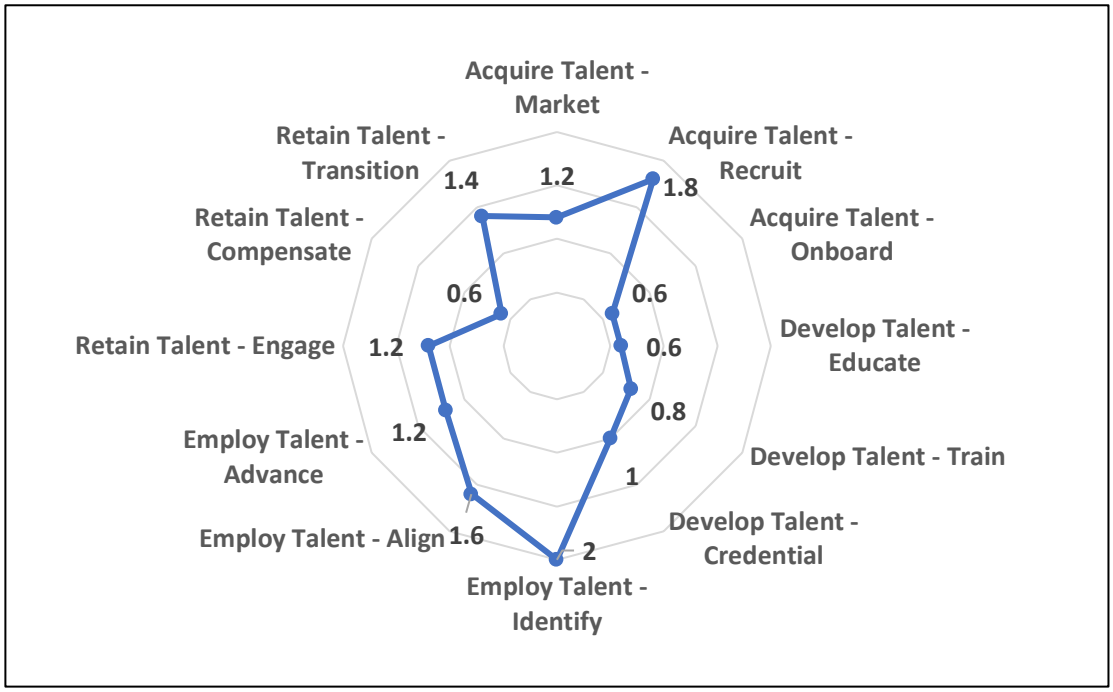
Line of Effort	Score
Acquire Talent - Recruit	2
Employ Talent - Identify	2
Employ Talent - Align	2
Employ Talent - Advance	2
Develop Talent - Educate	1.8
Develop Talent - Train	1.6
Develop Talent - Credential	1.6
Acquire Talent - Market	1.4
Retain Talent - Transition	1.4
Acquire Talent - Onboard	0.8
Retain Talent - Engage	0.8
Retain Talent - Compensate	0.8

Total Force Visibility: Elements Impact on People Strategy LOEs



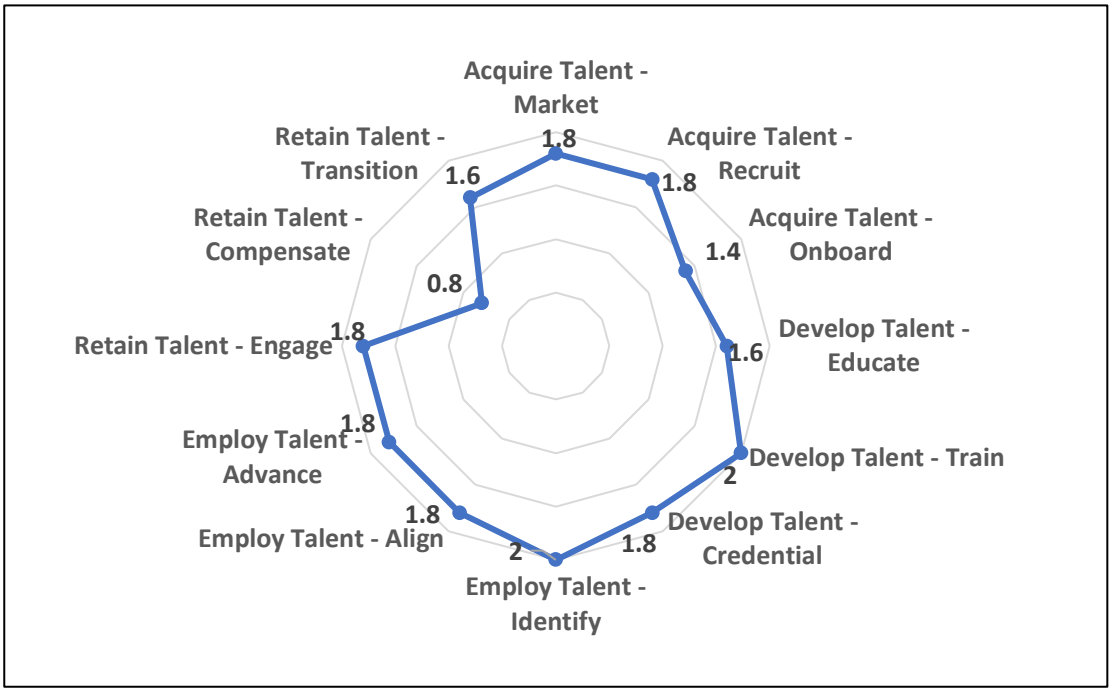
Line of Effort	Score
Acquire Talent - Recruit	2
Retain Talent - Engage	2
Acquire Talent - Onboard	1.8
Employ Talent - Identify	1.8
Employ Talent - Align	1.8
Employ Talent - Advance	1.8
Retain Talent - Compensate	1.8
Develop Talent - Educate	1.6
Develop Talent - Train	1.6
Develop Talent - Credential	1.6
Retain Talent - Transition	1.4
Acquire Talent - Market	1.2

Expandable Access to Personnel Inventory Across the DOD: Elements Impact on People Strategy LOEs



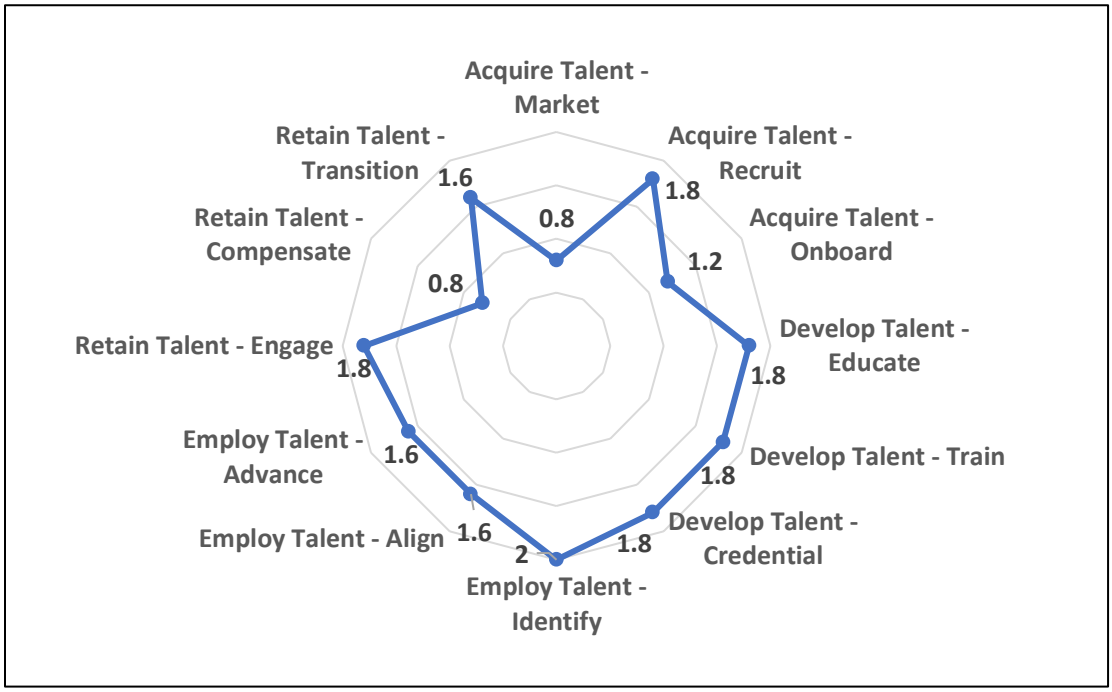
Line of Effort	Score
Employ Talent - Identify	2
Acquire Talent - Recruit	1.8
Employ Talent - Align	1.6
Retain Talent - Transition	1.4
Acquire Talent - Market	1.2
Employ Talent - Advance	1.2
Retain Talent - Engage	1.2
Develop Talent - Credential	1
Develop Talent - Train	0.8
Acquire Talent - Onboard	0.6
Develop Talent - Educate	0.6
Retain Talent - Compensate	0.6

Identify Knowledge, Skills, Behaviors, and Preferences (KSB-P): Elements Impact on People Strategy LOEs



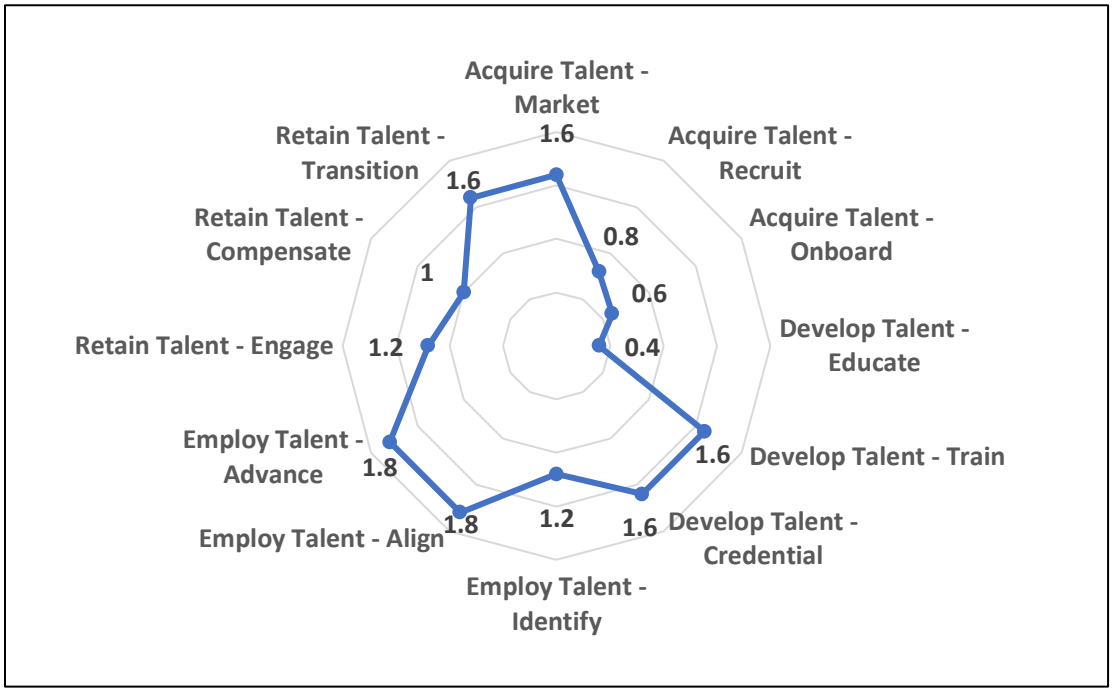
Line of Effort	Score
Develop Talent - Train	2
Employ Talent - Identify	2
Acquire Talent - Market	1.8
Acquire Talent - Recruit	1.8
Develop Talent - Credential	1.8
Employ Talent - Align	1.8
Employ Talent - Advance	1.8
Retain Talent - Engage	1.8
Develop Talent - Educate	1.6
Retain Talent - Transition	1.6
Acquire Talent - Onboard	1.4
Retain Talent - Compensate	0.8

Identify Up-Skilling Requirements to Test and Certify for KSB's: Elements Impact on People Strategy LOEs



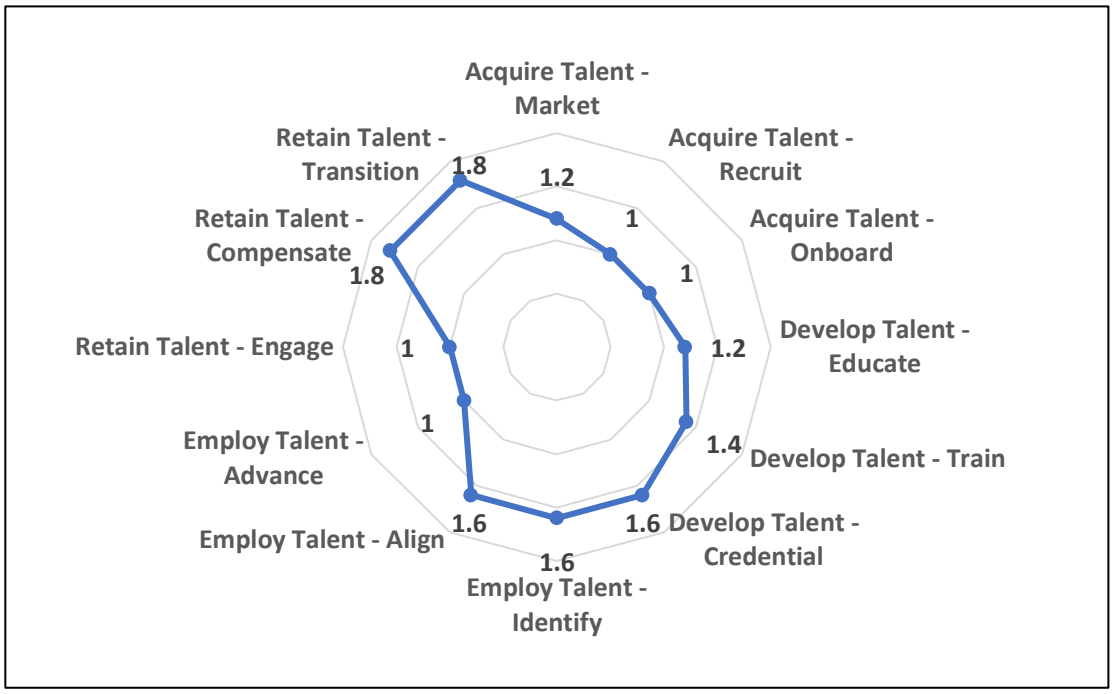
Line of Effort	Score
Employ Talent - Identify	2
Acquire Talent - Recruit	1.8
Develop Talent - Educate	1.8
Develop Talent - Train	1.8
Develop Talent - Credential	1.8
Retain Talent - Engage	1.8
Employ Talent - Align	1.6
Employ Talent - Advance	1.6
Retain Talent - Transition	1.6
Acquire Talent - Onboard	1.2
Acquire Talent - Market	0.8
Retain Talent - Compensate	0.8

Visibility of Total Force Requirements by the Individual: Elements Impact on People Strategy LOEs



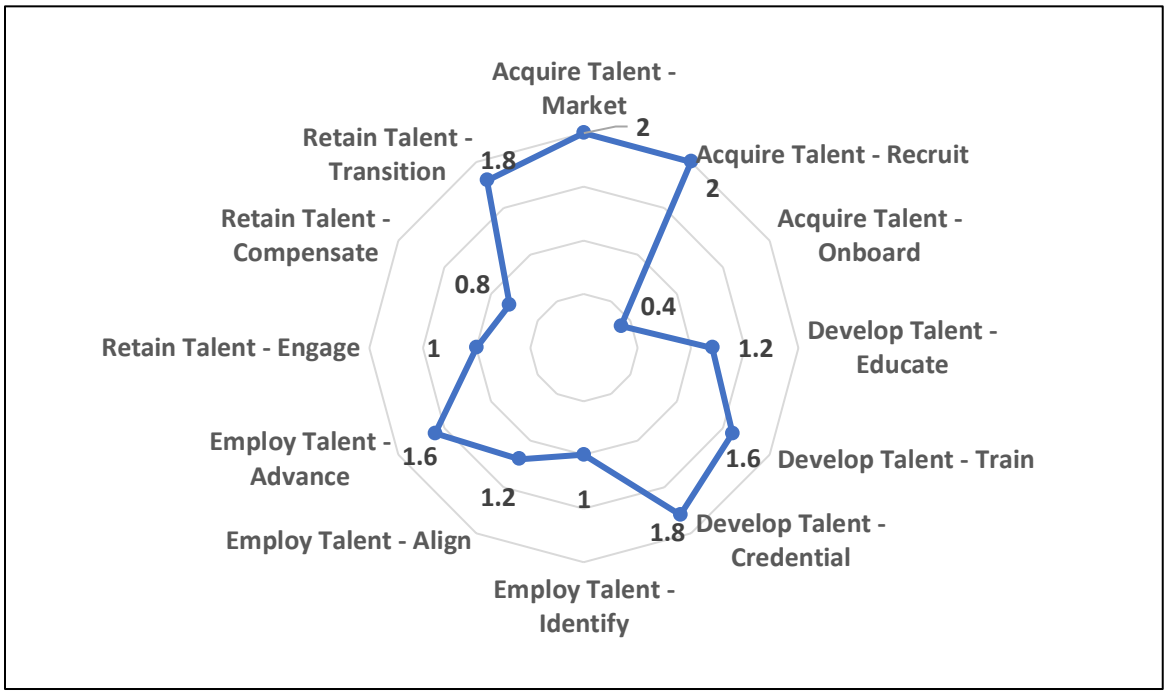
Line of Effort	Score
Employ Talent - Align	1.8
Employ Talent - Advance	1.8
Acquire Talent - Market	1.6
Develop Talent - Train	1.6
Develop Talent - Credential	1.6
Retain Talent - Transition	1.6
Employ Talent - Identify	1.2
Retain Talent - Engage	1.2
Retain Talent - Compensate	1
Acquire Talent - Recruit	0.8
Acquire Talent - Onboard	0.6
Develop Talent - Educate	0.4

Interoperable with Information Systems Across Army Enterprise: Elements Impact on People Strategy LOEs



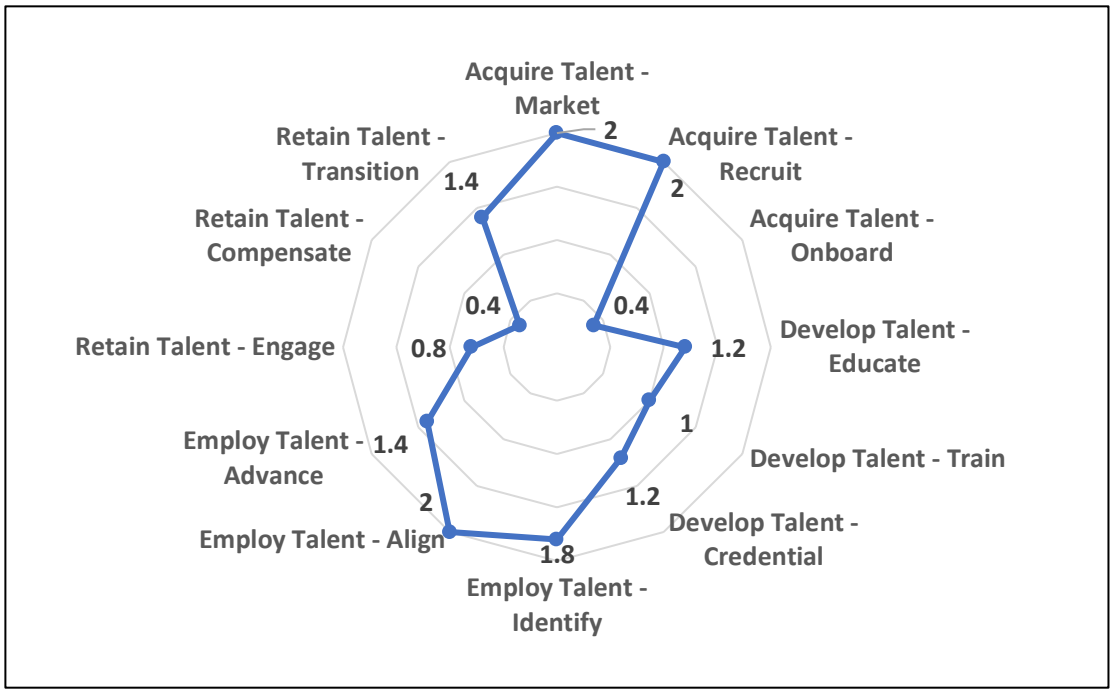
Line of Effort	Score
Retain Talent - Compensate	1.8
Retain Talent - Transition	1.8
Develop Talent - Credential	1.6
Employ Talent - Identify	1.6
Employ Talent - Align	1.6
Develop Talent - Train	1.4
Acquire Talent - Market	1.2
Develop Talent - Educate	1.2
Acquire Talent - Recruit	1
Acquire Talent - Onboard	1
Employ Talent - Advance	1
Retain Talent - Engage	1

Collaborate with Industry for Talent Acquisition: Elements Impact on People Strategy LOEs



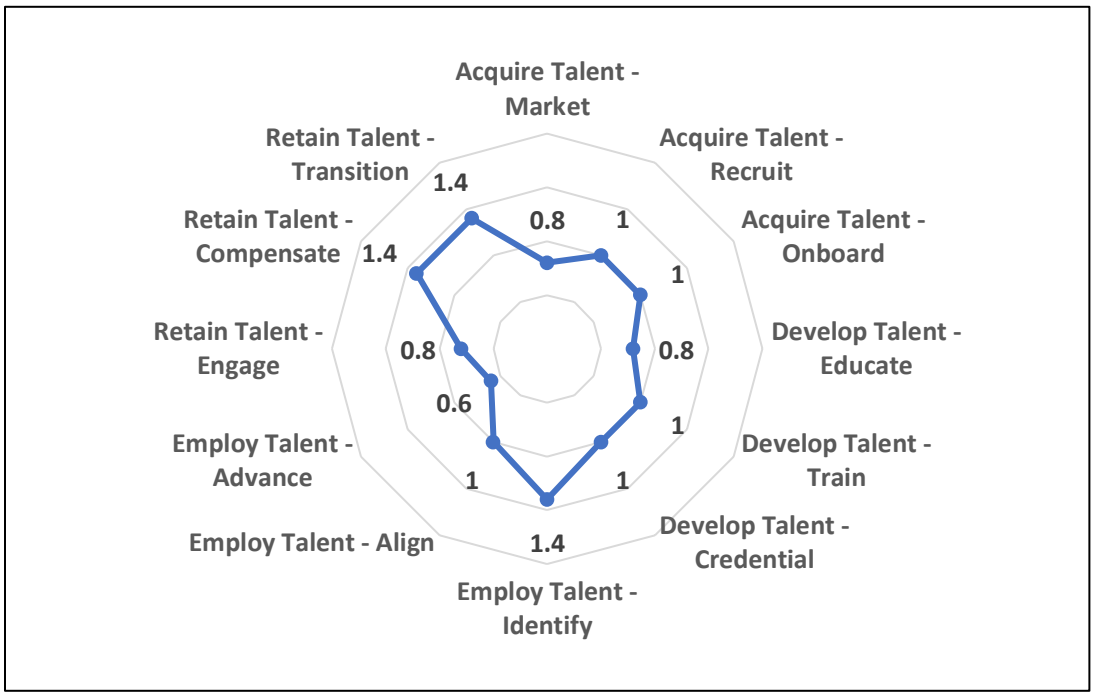
Line of Effort	Score
Acquire Talent - Market	2
Acquire Talent - Recruit	2
Develop Talent - Credential	1.8
Retain Talent - Transition	1.8
Develop Talent - Train	1.6
Employ Talent - Advance	1.6
Develop Talent - Educate	1.2
Employ Talent - Align	1.2
Employ Talent - Identify	1
Retain Talent - Engage	1
Retain Talent - Compensate	0.8
Acquire Talent - Onboard	0.4

Use of Natural Language Process Search Capabilities: Elements Impact on People Strategy LOEs



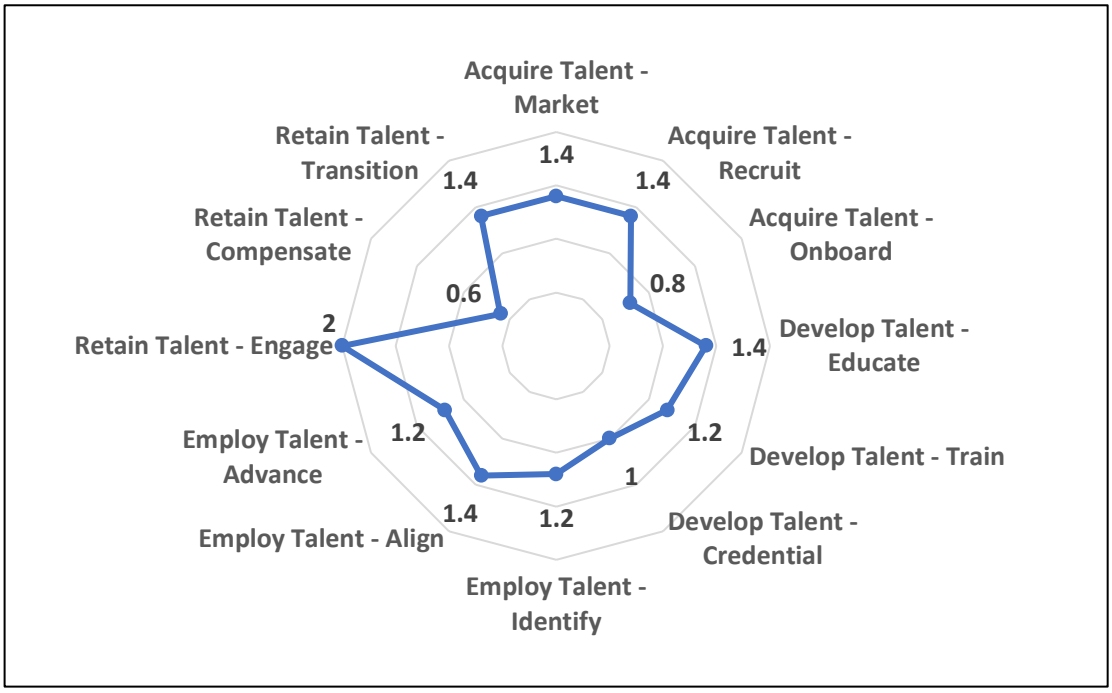
Line of Effort	Score
Acquire Talent - Market	2
Acquire Talent - Recruit	2
Employ Talent - Align	2
Employ Talent - Identify	1.8
Employ Talent - Advance	1.4
Retain Talent - Transition	1.4
Develop Talent - Educate	1.2
Develop Talent - Credential	1.2
Develop Talent - Train	1
Retain Talent - Engage	0.8
Acquire Talent - Onboard	0.4
Retain Talent - Compensate	0.4

Appropriate Access to the System: Elements Impact on People Strategy LOEs



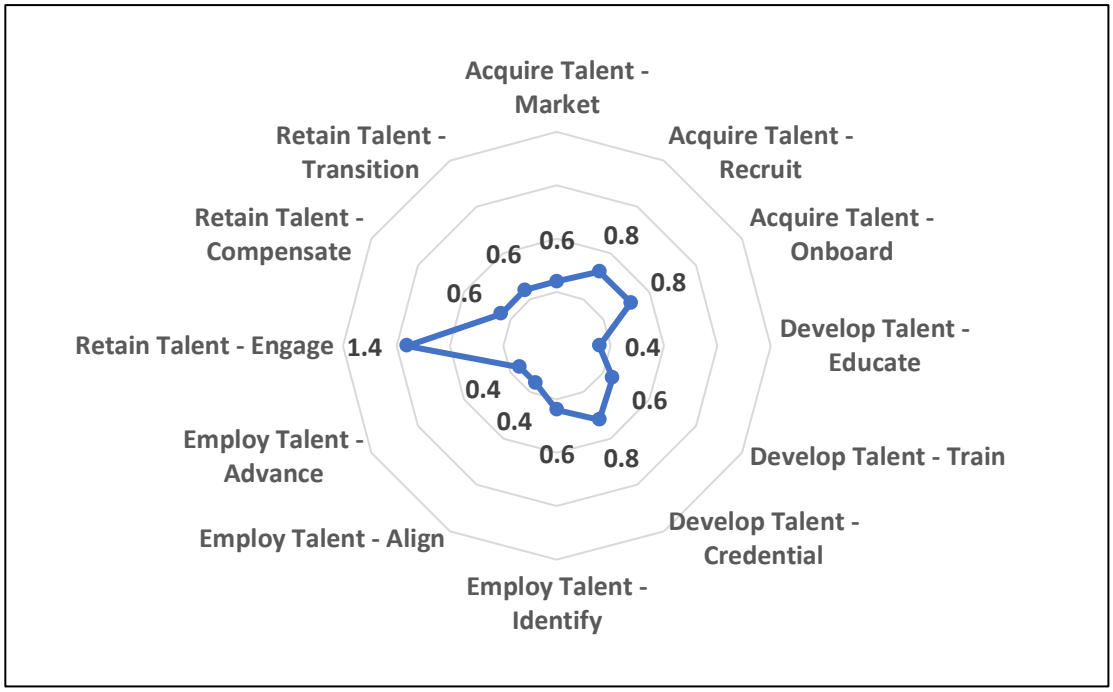
Line of Effort	Score
Employ Talent - Identify	1.4
Retain Talent - Compensate	1.4
Retain Talent - Transition	1.4
Acquire Talent - Recruit	1
Acquire Talent - Onboard	1
Develop Talent - Train	1
Develop Talent - Credential	1
Employ Talent - Align	1
Acquire Talent - Market	0.8
Develop Talent - Educate	0.8
Retain Talent - Engage	0.8
Employ Talent - Advance	0.6

Push Notifications, Both to the Army and to the Individual: Elements Impact on People Strategy LOEs



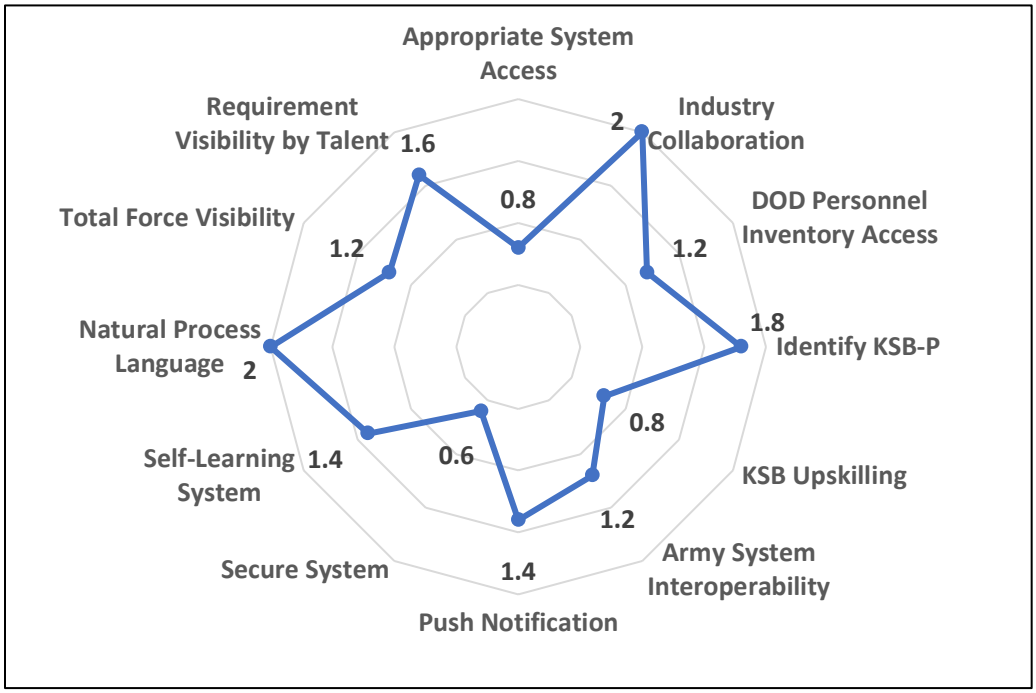
Line of Effort	Score
Retain Talent - Engage	2
Acquire Talent - Market	1.4
Acquire Talent - Recruit	1.4
Develop Talent - Educate	1.4
Employ Talent - Align	1.4
Retain Talent - Transition	1.4
Develop Talent - Train	1.2
Employ Talent - Identify	1.2
Employ Talent - Advance	1.2
Develop Talent - Credential	1
Acquire Talent - Onboard	0.8
Retain Talent - Compensate	0.6

Secure System: Elements Impact on People Strategy LOEs



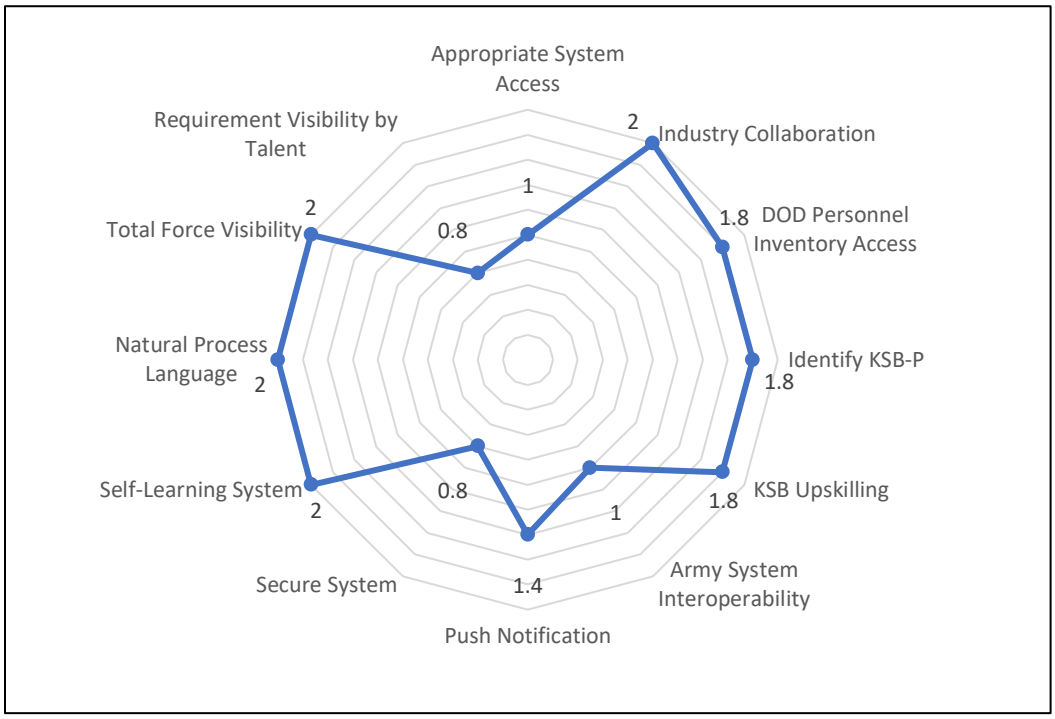
Line of Effort	Score
Retain Talent - Engage	1.4
Acquire Talent - Recruit	0.8
Acquire Talent - Onboard	0.8
Develop Talent - Credential	0.8
Acquire Talent - Market	0.6
Develop Talent - Train	0.6
Employ Talent - Identify	0.6
Retain Talent - Compensate	0.6
Retain Talent - Transition	0.6
Develop Talent - Educate	0.4
Employ Talent - Align	0.4
Employ Talent - Advance	0.4

Acquire Talent – Market: People Strategy LOEs Impact on Element



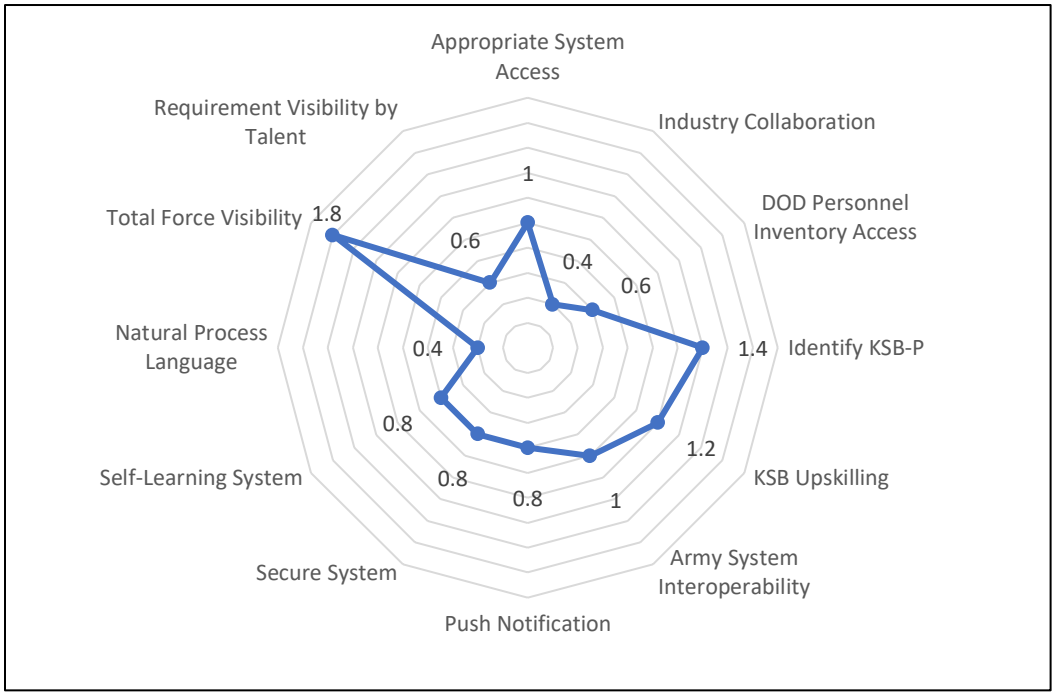
Element	Score
Collaborate with Industry for Talent Acquisition	2
Use of Natural Process Language Search Capabilities	2
Identify KSB-P	1.8
Visibility of Total Force Requirements by Individual	1.6
Push Notification, both to Army & Individual	1.4
Self-Learning System	1.4
Expandable Access to Personnel Inventory Across the DOD	1.2
Interoperable with Information Systems Across the Army Enterprise	1.2
Visibility of Total Force Available by Army	1.2
Appropriate Access to the System	0.8
Identify Upskilling Requirements to Test/Certify for KSBs	0.8
Secure System	0.6

Acquire Talent – Recruit: People Strategy LOEs Impact on Element



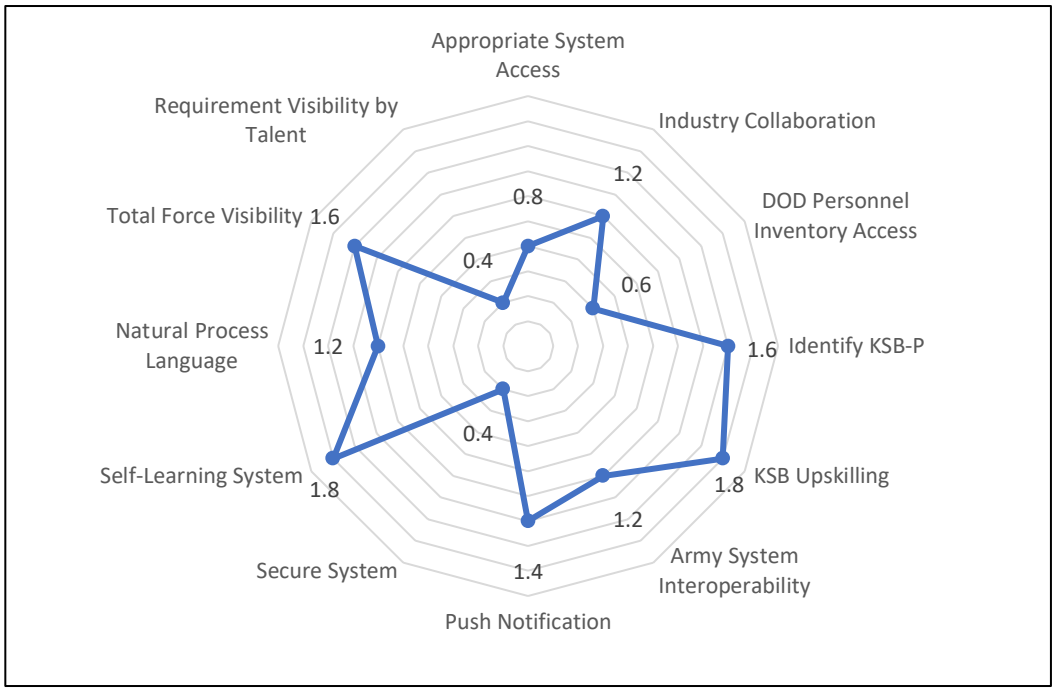
Element	Score
Collaborate with Industry for Talent Acquisition	2
Self-Learning System	2
Use of Natural Process Language Search Capabilities	2
Visibility of Total Force Available by Army	2
Expandable Access to Personnel Inventory Across the DOD	1.8
Identify KSB-P	1.8
Identify Upskilling Requirements to Test/Certify for KSBs	1.8
Push Notification, both to Army & Individual	1.4
Appropriate Access to the System	1
Interoperable with Information Systems Across the Army Enterprise	1
Secure System	0.8
Visibility of Total Force Requirements by Individual	0.8

Acquire Talent – Onboard: People Strategy LOEs Impact on Element



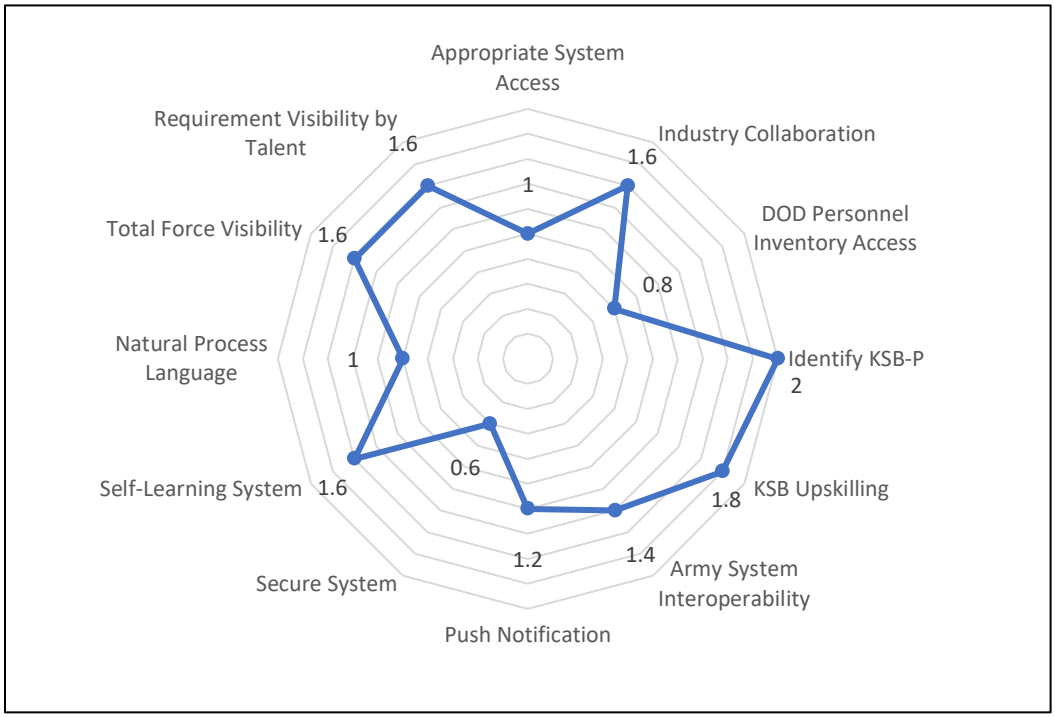
Element	Score
Visibility of Total Force Available by Army	1.8
Identify KSB-P	1.4
Identify Upskilling Requirements to Test/Certify for KSBs	1.2
Appropriate Access to the System	1
Interoperable with Information Systems Across the Army Enterprise	1
Push Notification, both to Army & Individual	0.8
Secure System	0.8
Self-Learning System	0.8
Expandable Access to Personnel Inventory Across the DOD	0.6
Visibility of Total Force Requirements by Individual	0.6
Collaborate with Industry for Talent Acquisition	0.4
Use of Natural Process Language Search Capabilities	0.4

Develop Talent – Educate: People Strategy LOEs Impact on Element



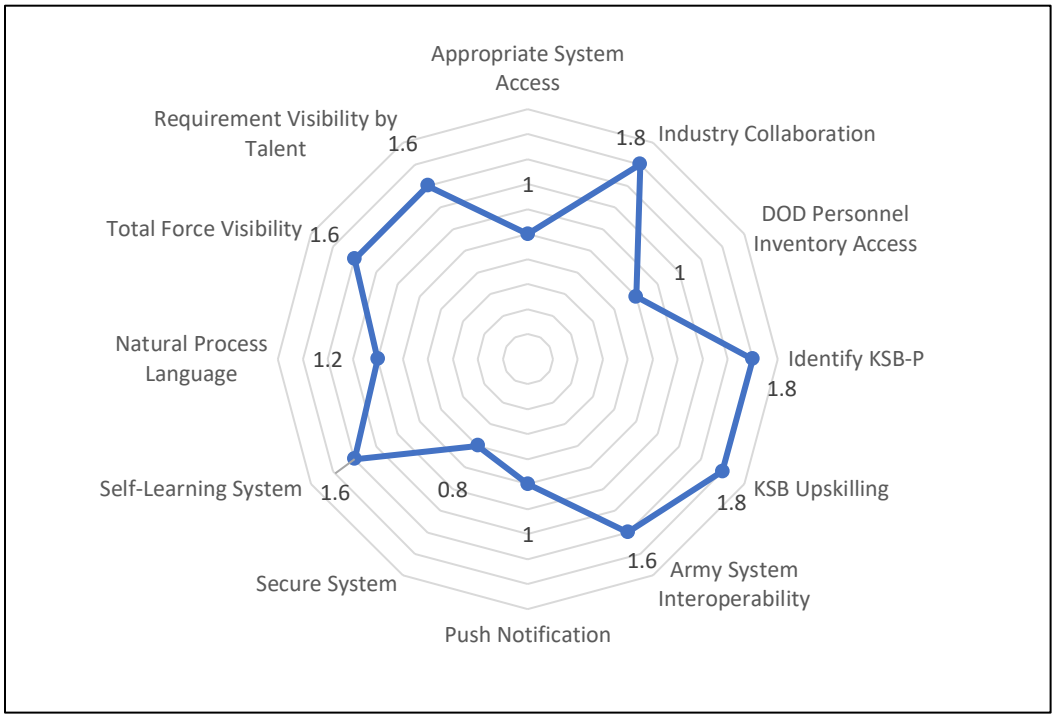
Element	Score
Identify Upskilling Requirements to Test/Certify for KSBs	1.8
Self-Learning System	1.8
Identify KSB-P	1.6
Visibility of Total Force Available by Army	1.6
Push Notification, both to Army & Individual	1.4
Collaborate with Industry for Talent Acquisition	1.2
Interoperable with Information Systems Across the Army Enterprise	1.2
Use of Natural Process Language Search Capabilities	1.2
Appropriate Access to the System	0.8
Expandable Access to Personnel Inventory Across the DOD	0.6
Secure System	0.4
Visibility of Total Force Requirements by Individual	0.4

Develop Talent – Train: People Strategy LOEs Impact on Element



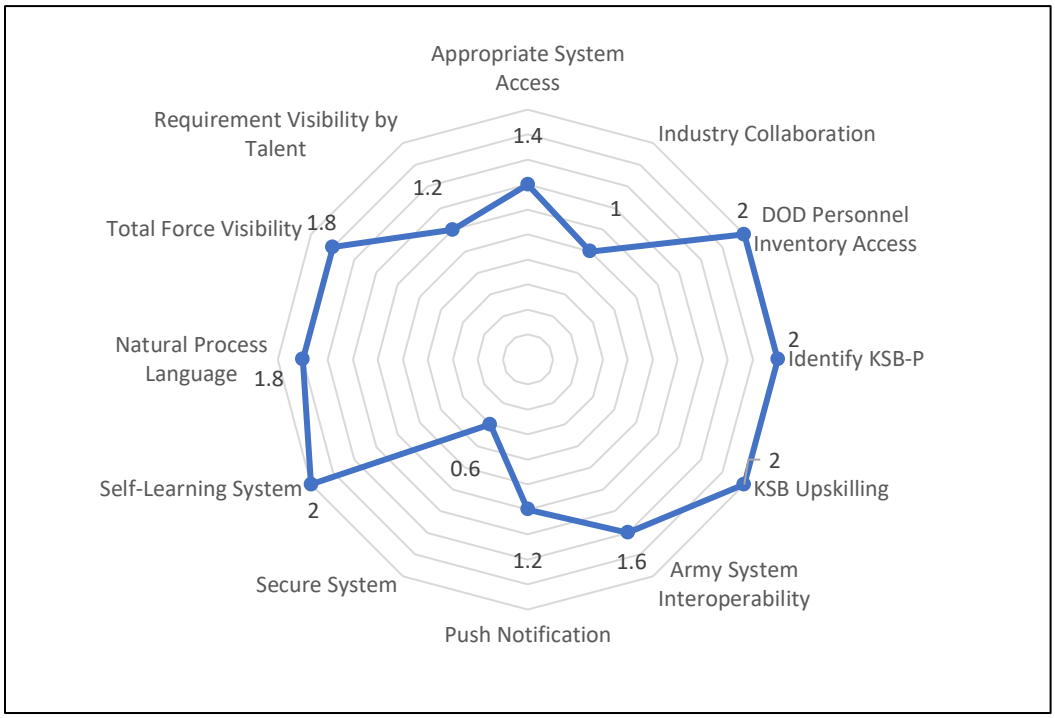
Element	Score
Identify KSB-P	2
Identify Upskilling Requirements to Test/Certify for KSBs	1.8
Collaborate with Industry for Talent Acquisition	1.6
Self-Learning System	1.6
Visibility of Total Force Available by Army	1.6
Visibility of Total Force Requirements by Individual	1.6
Interoperable with Information Systems Across the Army Enterprise	1.4
Push Notification, both to Army & Individual	1.2
Appropriate Access to the System	1
Use of Natural Process Language Search Capabilities	1
Expandable Access to Personnel Inventory Across the DOD	0.8
Secure System	0.6

Develop Talent – Credential: People Strategy LOEs Impact on Element



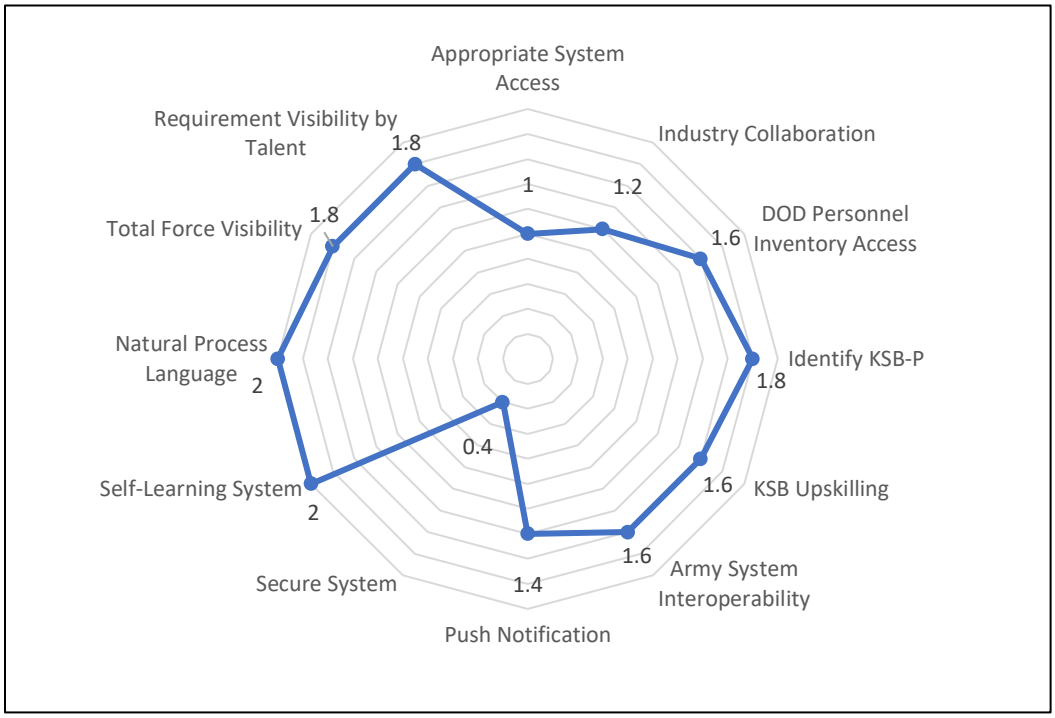
Element	Score
Collaborate with Industry for Talent Acquisition	1.8
Identify KSB-P	1.8
Identify Upskilling Requirements to Test/Certify for KSBs	1.8
Interoperable with Information Systems Across the Army Enterprise	1.6
Self-Learning System	1.6
Visibility of Total Force Available by Army	1.6
Visibility of Total Force Requirements by Individual	1.6
Use of Natural Process Language Search Capabilities	1.2
Appropriate Access to the System	1
Expandable Access to Personnel Inventory Across the DOD	1
Push Notification, both to Army & Individual	1
Secure System	0.8

Employ Talent – Identify: People Strategy LOEs Impact on Element



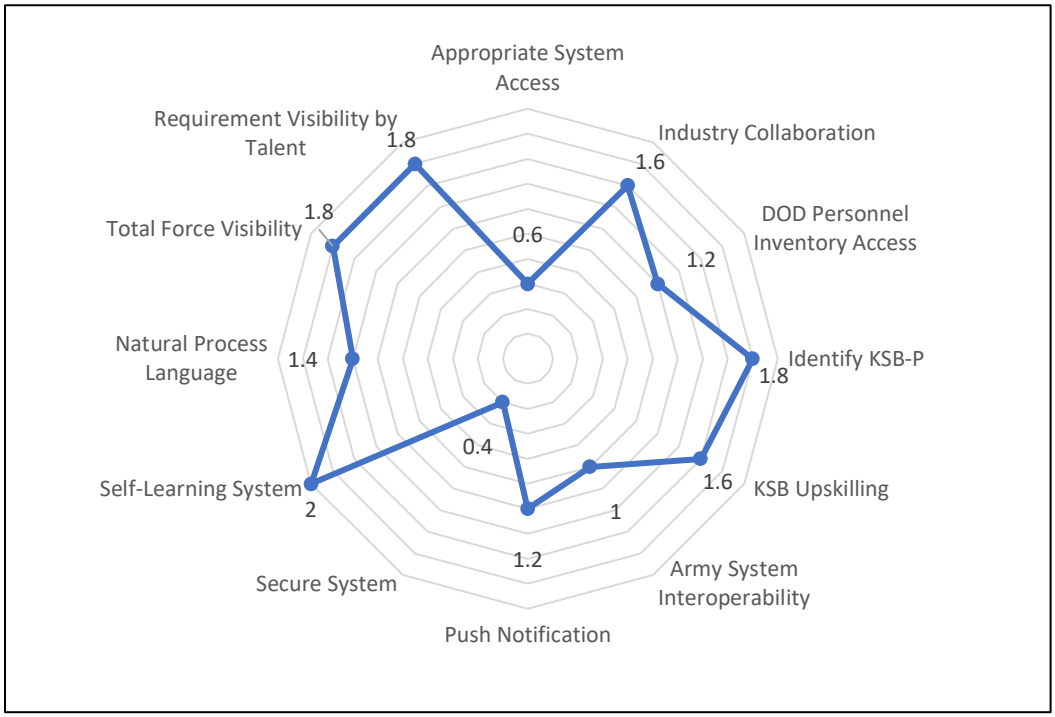
Element	Score
Expandable Access to Personnel Inventory Across the DOD	2
Identify KSB-P	2
Identify Upskilling Requirements to Test/Certify for KSBs	2
Self-Learning System	2
Use of Natural Process Language Search Capabilities	1.8
Visibility of Total Force Available by Army	1.8
Interoperable with Information Systems Across the Army Enterprise	1.6
Appropriate Access to the System	1.4
Push Notification, both to Army & Individual	1.2
Visibility of Total Force Requirements by Individual	1.2
Collaborate with Industry for Talent Acquisition	1
Secure System	0.6

Employ Talent – Align: People Strategy LOEs Impact on Element



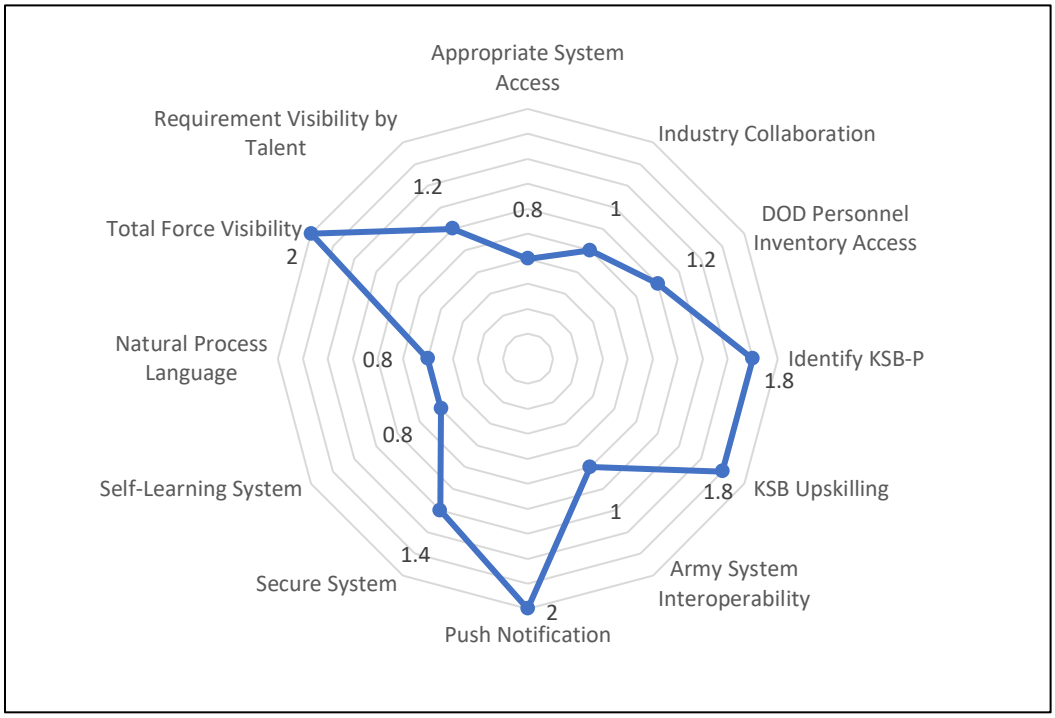
Element	Score
Self-Learning System	2
Use of Natural Process Language Search Capabilities	2
Identify KSB-P	1.8
Visibility of Total Force Available by Army	1.8
Visibility of Total Force Requirements by Individual	1.8
Expandable Access to Personnel Inventory Across the DOD	1.6
Identify Upskilling Requirements to Test/Certify for KSBs	1.6
Interoperable with Information Systems Across the Army Enterprise	1.6
Push Notification, both to Army & Individual	1.4
Collaborate with Industry for Talent Acquisition	1.2
Appropriate Access to the System	1
Secure System	0.4

Employ Talent – Advance: People Strategy LOEs Impact on Element



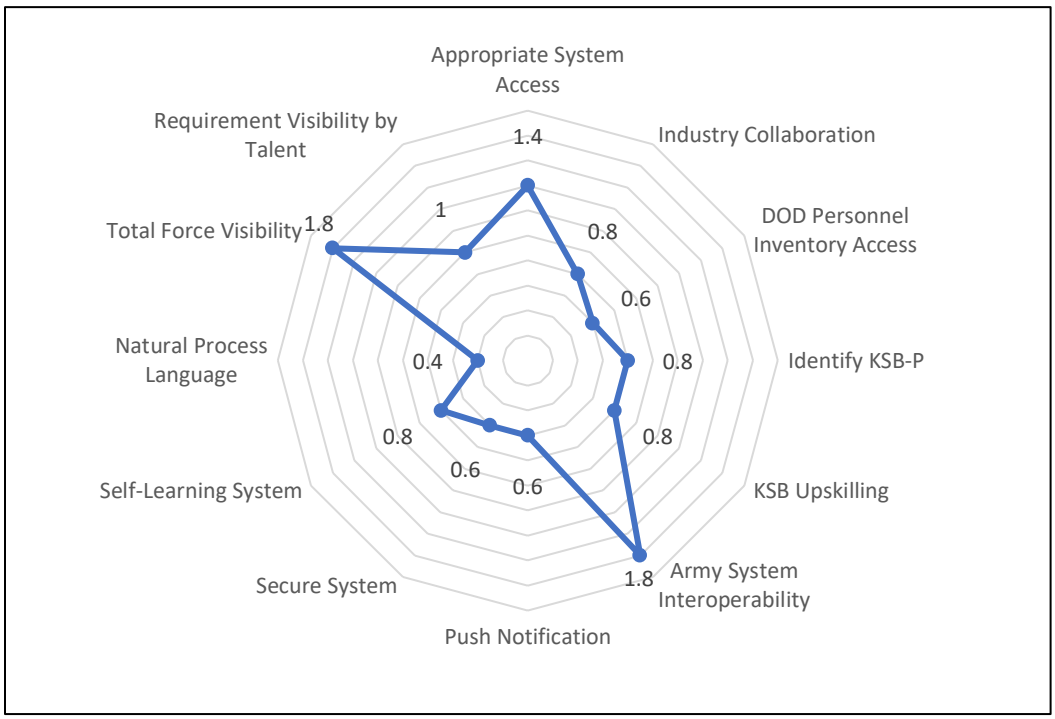
Element	Score
Self-Learning System	2
Identify KSB-P	1.8
Visibility of Total Force Available by Army	1.8
Visibility of Total Force Requirements by Individual	1.8
Collaborate with Industry for Talent Acquisition	1.6
Identify Upskilling Requirements to Test/Certify for KSBs	1.6
Use of Natural Process Language Search Capabilities	1.4
Expandable Access to Personnel Inventory Across the DOD	1.2
Push Notification, both to Army & Individual	1.2
Interoperable with Information Systems Across the Army Enterprise	1
Appropriate Access to the System	0.6
Secure System	0.4

Retain Talent – Engage: People Strategy LOEs Impact on Element



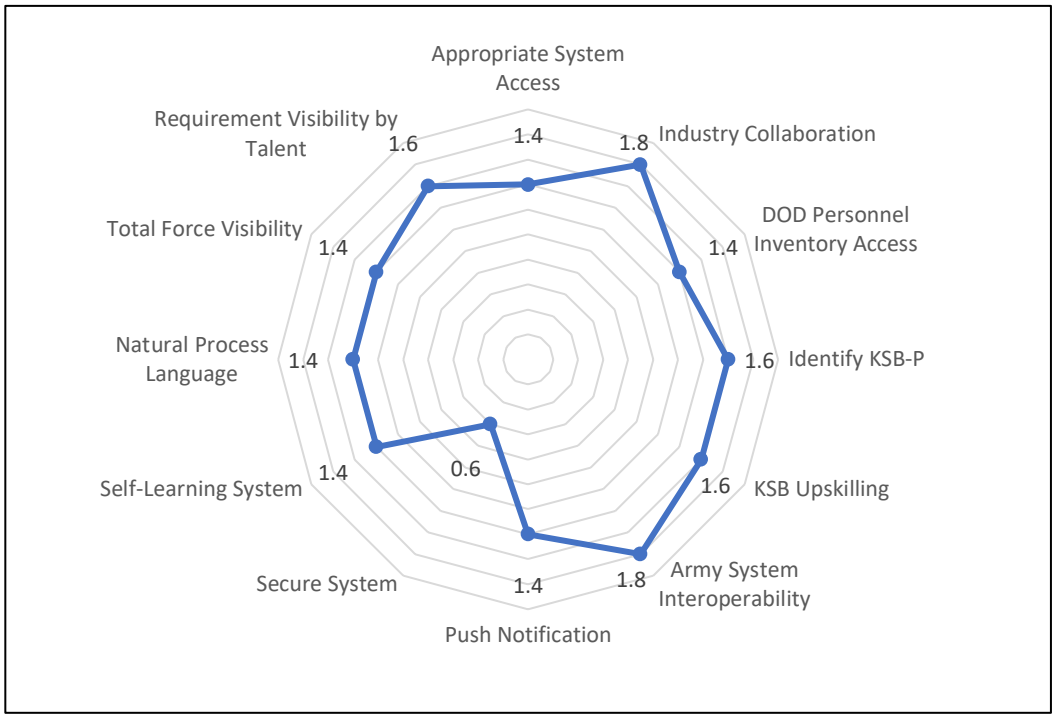
Element	Score
Push Notification, both to Army & Individual	2
Visibility of Total Force Available by Army	2
Identify KSB-P	1.8
Identify Upskilling Requirements to Test/Certify for KSBs	1.8
Secure System	1.4
Expandable Access to Personnel Inventory Across the DOD	1.2
Visibility of Total Force Requirements by Individual	1.2
Collaborate with Industry for Talent Acquisition	1
Interoperable with Information Systems Across the Army Enterprise	1
Appropriate Access to the System	0.8
Self-Learning System	0.8
Use of Natural Process Language Search Capabilities	0.8

Retain Talent – Compensate: People Strategy LOEs Impact on Element



Element	Score
Interoperable with Information Systems Across the Army Enterprise	1.8
Visibility of Total Force Available by Army	1.8
Appropriate Access to the System	1.4
Visibility of Total Force Requirements by Individual	1
Collaborate with Industry for Talent Acquisition	0.8
Identify KSB-P	0.8
Identify Upskilling Requirements to Test/Certify for KSBs	0.8
Self-Learning System	0.8
Expandable Access to Personnel Inventory Across the DOD	0.6
Push Notification, both to Army & Individual	0.6
Secure System	0.6
Use of Natural Process Language Search Capabilities	0.4

Retain Talent – Transition: People Strategy LOEs Impact on Element



Element	Score
Collaborate with Industry for Talent Acquisition	1.8
Interoperable with Information Systems Across the Army Enterprise	1.8
Identify KSB-P	1.6
Identify Upskilling Requirements to Test/Certify for KSBs	1.6
Visibility of Total Force Requirements by Individual	1.6
Appropriate Access to the System	1.4
Expandable Access to Personnel Inventory Across the DOD	1.4
Push Notification, both to Army & Individual	1.4
Self-Learning System	1.4
Use of Natural Process Language Search Capabilities	1.4
Visibility of Total Force Available by Army	1.4
Secure System	0.6

Appendix C: Trip Reports

Trip Report - TalentNet

TalentNet – Teleconference on February 26, 2020

Executive Summary:
On 20 February 2020 we met with Phil Cooper, Vice President for Global Client Strategy, (pcooper@talentnet.com) for TalentNet, Inc. (https://www.talentnet.com/). TalentNet is a vendor management service (VMS) used by large-scale contingent workforce programs to directly attract, retain and engage high-quality talent, without utilizing traditional staffing suppliers. The TalentNet platform is built with the job seeker in mind and offers organizations a suite of private talent community functionality. Job seekers benefit from machine learning, trained specifically to recommend opportunities and new roles based on their professional experience and skill set.

Supporting Point #1
TalentNet's job matching & candidate recommendation algorithms are natural language processing (NLP) based machine-learning models. These models perform semantic analysis on the work history (resume/CV), skill set and job titles of a candidate and compare those to a similar analysis performed on job descriptions. The output from the NLP model is combined with specific preferential filters such as work location and distance, rate preference vs. job rate proximity, willingness to travel/relocate and resource availability.

Supporting Point #2
TalentNet identifies three main streams of talent and is able to conduct a database search, internally and external – through agreements with industry partners (LinkedIn, Glassdoor, etc.) – to find qualified candidates. These three streams are:

1. Unknown talent – passive sites, integrated w/ linkedin, glassdoor, etc.
2. Known talent – retirees, former employers, etc.
3. Talent that knows the brand – actively seeking jobs.

Adepto – Teleconference on February 20, 2020

Executive Summary:

On 20 February 2020 we met with Ben Kirk, Director of Public Sector, (ben.kirk@adepto.com) for Adepto (https://www.adepto.com/). Adepto is a vendor management service (VMS) that enables organizations to build private networks that match internal and external workers to project, gig, and job opportunities that fit their skills and career goals. It also provides business leaders with easy-to-use tools to track and access the skill sets and interests of their entire pool of available talent — current and past employees, as well as contractors, freelancers, consultants, and potential new hires. They were recently purchased by Degreed, https://degreed.com/, an education technology company that is engaged in enabling and recognizing professional and lifelong learning and skills. The platform allows users to learn, develop and measure their skills.

Supporting Point #1

Adepto believes the need for on-demand talent is on the rise, meaning that having a talent management strategy vital. There will also be a shifting of skills and widespread career changes because of automation being adopted by more industries. Entirely new jobs will be created (many of which we cannot yet predict) and tracking skills across multiple careers and roles will be vital

Supporting Point #2

According to Mr. Kirk, the make-up of the workforce – office vs. remote; permanent vs. contract – has seen a shift over the last 3-4 years of 80% permanent to 40-50%, complimented with contractors. Within the UK, what is widely reported as a talent shortage is inaccurate. The real issue is a lack of visibility of what is out there. This is where Adepto helps an organization. They provide visibility on what is already available and leverage talent quickly.

Supporting Point #2

The merger with Degreed adds the capability to test, measure, and verify candidates' qualifications. They can also train new skills. Online, or virtual, classes can be conducted to support upskilling of a talent pool.

Adepto - Total Talent
- from buzzword to b

Trip Report – National Fitness Partners

National Fitness Partners– In person meeting with CEO on February 4th, 2020

Executive Summary:

Meeting with Stephen Kindler Jr., President and CEO of National Fitness Partners (NFP) which owns approximately 75 Planet Fitness facilities across the northeast. Most membership (60%) includes the 18-42 demographic which is being targeted as those most interested in health and fitness at this point. NFP is continuously looking for opportunities for partnership in order to help the community while targeting potential members. NFP is currently moving away from part time workers and investing in full time workers in order to stabilize the team.

Supporting Point #1

Planet Fitness nationwide conducted a Teen Summer Challenge last year which was a huge success. Locations opened up to all 13-17 year olds free of charge so they could work out and have a place to get exercise in. The secondary result was that many parents joined the gym in order to keep an eye on their kids. The result was over 1 million teens exercising across the United States. Plans are in place to continue this effort in the coming years.

Supporting Point #2

The impacts of obesity may actually help the fitness industry as awareness grows and more people get involved in an attempt to address it. Stephen see's a lack of physical education in schools as an issue and has identified a potential opportunity in the future to partner with schools in some capacity.

Supporting Point #3

Most employees have typically been part time – around 60% over time. The company, however, is slowly shifting towards full time staffing in order to better develop people, reduce turnover and onboarding costs (7K/employee). Benefits are seen in an expected reduction in turnover along with increased customer satisfaction due to familiarity with employees.

"National Fitness Partners would be in favor of exploring a potential partnership agreement with Army Marketing to help drive a collaborative promotional effort"

Trip Report - Amazon

Amazon – Teleconference with Ms. Sarah Martin, Amazon, Military Affairs Program Coordinator, 27 January 2020 ~ 1400 EST

Executive Summary:
Ms. Sarah Martin Amazon's Military Affairs Program Coordinator is responsible for outreach operations for Amazon and the Department of Defense, she helps Amazon bridge the connections between Amazon and the DOD. She is responsible for strategic, operational, and tactical internships across Amazon's business sector with organizations across the DOD. Teleconference was between Ms. Sarah Martin, COL Steven Clark, USAWC Resident Student, and LTC Marty Lepak, USAWC Resident Student. The purpose of the teleconference was to discuss Amazon's talent management priorities and methods for filling corporate talent requirements.

Supporting Point #1
Amazon's Leadership Principles are the driving factor driving decisions at Amazon Corporate and across all business sectors. The #1 Principle – Customer Obsession is the prime driver of all decisions within the organization. The corporate culture is prevalent across all business sectors and are used in decisions used across the organization.

Supporting Point #2
Self-development and upskilling are extremely important to Amazon and their ability to maintain a competitive edge and in continuing to innovate. As an organization they want Amazon to be an employer of choice and pay for degrees for Amazon associate/team members. They encourage associates from all business sectors, whether they work at corporate headquarters or in one of the many fulfillment centers, to gain formal education and work toward a degree. The emphasis is that Amazon encourages individuals at the fulfillment centers to go to school knowing that they will likely earn a degree and work for a different organization; hoping that as they depart Amazon, they will become an ambassador for Amazon.

Supporting Point #3
Amazon supports a Machine Learning University at Amazon Headquarters where they train associates artificial intelligence and machine learning. Since 2018, Amazon has offered training to associates in machine learning and artificial intelligence in an effort to accelerate AI & ML within Amazon.

Supporting Point #4

Talent seem to move between Amazon, Boeing, Blue Origin, and other technology companies within the greater Seattle, WA metropolitan area. Change is expected for Amazon as they continue to bring in new talent and talent departs to go to another organization. The hope is that eventually talent will come back to Amazon with more skills than they departed and be able to add value to Amazon again. “Change is the only constant in terms of talent.” – Sarah Martin

A follow-up face-to-face meeting was planned for March 12-13, 2020 but because of the Covid-19 pandemic that affected the Seattle area and the U.S. the follow-up was cancelled.

HireVue – Teleconference on March 11, 2020

Executive Summary:

On 20 February 2020 we met with Michael Grimes, Regional Vice President, (mgrimes@hirevue.com) for HireVue (https://www.HireVue.com/). HireVue is a talent management service (TMS) that uses a combination of proprietary voice recognition software and licensed facial recognition software in tandem with a ranking algorithm to determine which candidates most resemble the ideal candidate. "The ideal candidate is a composite of traits triggered by body language, tone, and key words gathered from analyses of the existing best members of a particular role."[H]

Supporting Point #1

HireVue's "AI-driven assessments" have become so pervasive in some industries, including hospitality and finance, that universities make special efforts to train students on how to look and speak for best results. More than 100 employers now use the system, including Hilton and Unilever, and more than a million job seekers have been analyzed.[H]

Supporting Point #2

HireVue recently prepared a brief for TRADOC and has begun doing some work with the United States Military Academy.
https://view.highspot.com/viewer/5e666afbf7794d267019f8ab

Supporting Point #3

HireVue works with more than **700 customers globally**, including leading brands, such as Vodafone, Tiffany & Co., Honeywell, Carnival Cruise Line, and 40% of Fortune's Most Admired. "We help our clients lead their industries with 50% faster growth, 29% less turnover, and 13% more top performers." HireVue was named among the top 10 "Most Promising Companies" in America by Forbes and is a five-time winner of "Top HR Product of the Year" by HR Executive Magazine.

Trip Report - Boeing

Boeing Corporation – Discussion on February 20, 2020

Executive Summary

On 20 February 2020 we met with, Dr. Kristin Saboe, Global Senior Manager, Employee Listening and Talent Strategy, kristin.n.saboe@boeing.com. Boeing is the world's largest aerospace company and leading manufacturer of commercial jetliners, defense, space and security systems and service provider of aftermarket support. As America's biggest manufacturing exporter, the company supports airlines and U.S. and allied government customers in more than 150 countries. Boeing products and tailored services include commercial and military aircraft, satellites, weapons, electronic and defense systems, launch systems, advanced information and communication systems, and performance-based logistics and training. LTC Marty Lepak and COL Steven Clark conducted the interview.

Supporting Point #1

Boeing is both a manufacturer and a technology company that has been in business over 100 years. As a result, they are a large employer with a specific talent set (technology and engineering) that limits their talent population in this economy. Boeing's focus is to serve their employee's and develop them understanding that employees change jobs three or four times throughout their careers. Dr. Saboe discussed the shift in favor of the employee in the hiring process vice the employer. Boeing is focusing on the employee through personal development and growth plans, allowing entry and re-entry to develop talent inside and outside the company and focusing on holistically developing employees through personal and professional pursuits.

Supporting Point #2

Boeing is changing its roles of leader and manager. Having to change from formal manager or leader to more of a coach in developing their employees. Some of this change is a result of generational and some is technology driven. Many teams are set up for functional purposes and are not necessarily co-located. This requires new skills for the leader/manager in developing and leading their teams. They encourage upskilling and reskilling through incentives and company benefits that support continuing education and licensure both inside and outside the company.

Supporting Point #3

Dr. Saboe said Boeing is 1) exploring ways of leveraging the Gig economy by bringing in critical talent that may be hard to find 2) Employing people through flexible work arrangements to assist those with critical skillsets overcome traditional work/life demands, acknowledging the half-life of skills is perpetually decreasing 3) Critical skills are easy to move around in a large company to help place the right talent at the right place at the right time, however this is a challenge for smaller companies.

Supporting Point #4

One of the trends is that soft skills trump hard skills. Hard skills you can teach whereas soft skills are not all easily teachable, especially in short periods of time. Boeing assesses soft skills during later touch points in the application process. Finally, from research, conscientiousness is the highest correlated trait tied to successful job performance.

Trip Report – Allison Transmission

Allison Transmission – Teleconference with Ms. Rebecca Jimenez, Managing Director, Talent Acquisition & Development, Human Resources, 17 February 2020 ~ 1100 EST

Executive Summary

Ms. Rebecca Jimenez, Allison Transmission, Managing Director, Talent Acquisition & Development, Human Resources is responsible for development, recommendations, implementation, and execution of HR operations for Allison Transmission, a medium sized (~3,000 employee) manufacturing company based out of Indianapolis, IN. Teleconference was between Ms. Rebecca Jimenez, COL Steven Clark, USAWC Resident Student, and LTC Marty Lepak, USAWC Resident Student. The purpose of the teleconference was to discuss Allison Transmission's talent management priorities, challenges within HR in a growing manufacturing company, Allison's corporate culture, and how technologies have changed HR functions in acquiring, onboarding, and employing employees.

Supporting Point #1

Allison Transmission's corporate culture has remained focused on their Values even as Allison Transmission has grown through acquisition of many smaller companies over the last decade. With the acquisition and purchasing of new organizations come challenges with how the company deals with a changing workforce. The demand for workers continues to change faster than businesses can adjust to change, which has kept Allison Transmission focused on the core values. Gone are many of the formal, rigid processes between superior and subordinate. More interactions that are less formal, more communications that enable technologies and life-like interactions vs. formal counseling or calendar-driven performance reviews.

Supporting Point #2

Self-development and upskilling are extremely important to Allison Transmission. The company is split evenly between manufacturing and profession employees and there is a separate focus for each half of the organization. The manufacturing side is focused on building skills associated with maintaining a competitive edge in manufacturing, so a great deal of effort is put into development and maintaining skills associated with manufacturing processes and maintaining a workforce with the required skills to maintain manufacturing operations. Allison Transmission uses ExecOnline for upskilling and leader development. Additionally, there has been a renewed focus on talent-sharing across the organization as they look at growing mid-level management into the future VP-level leadership of the organization. The talent-sharing allows

individuals exposure to other processes outside their normal departments through a 6-8 week program.

Supporting Point #3

Allison Transmission is having difficulties with filling skilled trade positions within their manufacturing departments as competition continues for the reduced number of skilled tradesmen nationally. Allison Transmission has an apprenticeship program they developed through partnerships with public secondary and trade schools within Indianapolis to educate and train the skilled tradesmen required to fill known future shortages. The 2-3 year program has required an investment on the part of Allison Transmission that they hope will pay off 10-years from now as they are seeing a big shortfall on-about 2027-2030.

Supporting Point #4

In 2017 Allison Transmission launched an internal system, through a partnership with WorkDay, to run many of the organization's core HR functions. The system is used throughout the recruitment, onboarding, and daily HR tasks for all employees. It is Allison Transmission's enterprise resource planning software that is the backbone of their people enterprise.

Appendix D: Words of Estimated Probability Table and Definitions

Subjective Probability Table		
Term	***Score***	***Range (percent)***
Highly probable	10	91 to 100
Probable	9	81 to 90
Highly likely	8	71 to 80
Likely	7	61 to 70
Possible	5 to 6	41 to 60
Unlikely	4	31 to 40
Highly unlikely	3	21 to 30
Improbable	2	11 to 20
Highly improbable	1	1 to 10

Figure 1: Subjective Probability Table. Source: ATP 2.33-4 Table 3-1

Highly Probable: Term used to describe a recommendation with a subjective probability ranking between 91 and 100%

Probable: Term used to describe a recommendation with a subjective probability ranking between 81 to 90%

Highly likely: Term used to describe a recommendation with a subjective probability ranking between 71 to 80%

Likely: Term used to describe a recommendation with a subjective probability ranking between 61 to 70%

Possible: Term used to describe a recommendation with a subjective probability ranking between 41 to 60%

Unlikely: Term used to describe a recommendation with a subjective probability ranking between 31 to 40%

Highly unlikely: Term used to describe a recommendation with a subjective probability ranking between 21 to 30%

Improbable: Term used to describe a recommendation with a subjective probability ranking between 11 to 20%

Highly improbable: Term used to describe a recommendation with a subjective probability ranking between 1 to 10%

Appendix E: Peterson Table of Analytic Confidence Assessment

Peterson Table of Analytic Confidence Assessment	**Points Possible**	**Example Points**
Use of Structured Method(s) In Analysis	**(1-10)**	***7***
For example: ACH, IPB, Social Networking, Bayes, Simulation, etc…		
10 indicating highest possible score when considering factors below		
Consider:		
Number of methods used		
Applicability of methods to the analysis		
Level of robustness of method		
Degree to which methods' results coincide		
Overall Source Reliability	**(1-10)**	***7***
A rating of 10 indicates the highest reliability		
Source Corroboration/Agreement: *Level of conflict amongst sources*	**(1-5)**	***4***
5: No confliction amongst sources		
4: Very little conflict amongst sources		
3: Moderate conflict amongst sources		
2: Significant conflict amongst sources		
1: Sources conflict on nearly all points		
Level Of Expertise On Subject/Topic & Experience	**(1-5)**	***2***
5: Deep, intimate knowledge and understanding & 3+ years experience with topic		
4: Wide knowledge & 1-3 years experience with topic		
3: Moderate knowledge & 6-12 months experience with topic		
2: Minimal knowledge & 0-5 months experience with the topic		
1: No knowledge & no experience with the topic		
Amount of Collaboration:	**(1-5)**	***2***
5: Part of aggregated individual analyses		
4: Worked on a team		
3: Worked with a partner		
2: Casual discussion		
1: Completely individual work		
Task Complexity	**(1-5)**	***3***
5: Minimally complex & challenging		
4: Somewhat complex & challenging		
3: Moderately complex & challenging		
2: Quite complex & challenging		
1: Very complex & highly challenging		
Time Pressure: *Time given to make analysis*	**(1-5)**	***4***
5: No deadline		
4: Easy to meet deadline		
3: Moderate deadline		
2: Demanding deadline		
1: Grossly inadequate deadline		
	Score:	**29**
	Total Possible:	**45**
	Score:	**0.644444444**
		x 10
	Analytic Confidence Adjusted Score:	**6.4**

An Example of Peterson's Table of Analytic Confidence Assessment for evaluating sources. Source: Joshua J. Peterson's Masters Thesis

Appendix F: Friedman Corollaries

Two questions a researcher should ask oneself in order to reassess bias and improve validity to an estimate.

1. Is my estimate within the range of reasonable opinion surrounding the question?
2. How likely is it that new information will change my estimate?

Source: Jeffrey A. Friedman

Appendix G: Normans Online Source Credibility Scale

Trust Scale and Web Site Evaluation Worksheet
(Updated OCT 2013)

Piece of Evidence #:												Score:	Trust Scale:
Criteria	**Tips**	**Value**	**Y or N**	**Y or N**	**Y or N**	**Y or N**	**Y or N**	**Y or N**	**Y or N**	**Y or N**	**Y or N**	**0**	**15-20 High**
Content can be corroborated?	Check some of the site's facts	2											**11-15 Moderate**
Recommended by subject matter expert?	Doctor, biologist, country expert	2											**6-10 Low**
Author is reputable?	Google for opinions, ask others	2											**5-0 Not Credible**
You perceive site as accurate?	Check with other sources; check affiliations	1.5											
Information was reviewed by an editor or peers?	Science journals, newspapers	1.5											
Author is associated with a reputable org?	Google for opinions, ask others.	1.5											
Publisher is reputable?	Google for opinions, ask others.	1.5											
Authors and sources identified?	Trustworthy sources want to be known	1											
You perceive site as current?	Last update?	1											
Several other Web sites link to this one?	Sites only link to other sites they trust	1											
Recommended by a generalist?	Librarian, researcher	1											
Recommended by an independent subject guide?	A travel journal may suggest sites	1											
Domain includes a trademark name?	Trademark owners protect their marks	1											
Site's bias in clear?	Bias is OK if not hidden	1											
Site has professional look?	It should look like someone cares	1											
Total		**20**											

19 Dec 2001: The criteria and weighted values are based on a survey input from 66 analysts. For details see: http://daxrnorman.googlepages.com/analysis. Edited for simplicity by Kristan J. Wheaton, OCT 2013
3 Feb 2012: Excel Spreadsheet which adds auto-sum was produced by Bill Welch, Deputy Director, Center for Intelligence Research Analysis and Training, Mercyhurst College.
26 Jan 2013: Trust Scale and Web Site Evaluation Worksheet is in the PUBLIC DOMAIN.

About the Authors:

Vincent A. Amerena Sr. is a Lieutenant Colonel in the United States Army. After enlisting as a Military Intelligence Soldier in 1982, LTC Amerena transitioned to the Army National Guard in 1989 and was commissioned through the Massachusetts Military Academy as a Military Police officer. Having served in the USAR, ARNG, and the active component, LTC Amerena has significant experience in both military and civilian law enforcement, detention operations, criminal investigations, and has commanded at the company and battalion level. He is married to the former Celeste Roussi-Perrot of Saint Lucia and has six children and three grandchildren. After his academic year at the U.S. Army War College, Vincent will serve as the Provost Marshal for the U.S. Army Pacific at Fort Shafter, Hawaii.

Steven M. Clark is a Colonel in the U.S. Army and a career logistician. After enlisting in the Army in 1990 as a Field Artillery Crewman, he graduated from Federal Officer Candidate School and was commissioned a Quartermaster Officer in 1997. He has commanded at company and battalion and served in tactical, operational, and institutional positions at numerous locations around the world to include multiple deployments. He is married to the former Stacie Hicks of Blanco, Texas; together they have two teenage children. After his academic year at the U.S. Army War College, Steven will serve as the G-4, First U.S. Army, Rock Island Arsenal, Illinois.

Andrew L. Heymann is a Lieutenant Colonel in the U.S. Army and a career infantryman. He graduated from Federal Officer Candidate School and was commissioned an Infantry Officer in 1999. He has served on both Active Duty and the National Guard, successfully completed multiple overseas deployments, and commanded at every level from Platoon to Battalion. He and his wife, Jenn, live in Kennesaw, GA with their two daughters. After his academic year at the U.S. Army War College, Andy will return to serving full time with the Georgia Army National Guard.

Martin D. Lepak is a Lieutenant Colonel in the U.S. Army Reserve and a career engineer. After enlisting in the Army Reserve in 1985, he graduated from the Wisconsin Military Academy, WIARNG and was commissioned an Engineer Officer in 1997. He has served in tactical, operational, and institutional positions at numerous locations across the continental U.S. and overseas to include multiple deployments. He is married to Jerilynn, a university professor of Mathematics Education and together have raised three adopted boys from the foster care system. After his academic year at the U.S. Army War College, Martin will serve as the Senior Reserve Advisor, I Corps Headquarters, Joint Base Lewis McChord, Washington.

John A. Urciuoli is a Colonel in the U.S. Army and a Medical Service Corps Officer. He enlisted in 1990 as an Avionics Mechanic serving six years before attending college and receiving a commission as a Medical Service Corps Officer in 1999. Colonel Urciuoli served in a variety of operational and support roles across the Army to include command at the Company and Battalion levels while serving in combat, OCONUS and stateside assignments. He is married to Michelle and they have one daughter, Grace. After his academic year at the United States Army War College, John will assume command of the Public Health Command (Central) for the United States Army based at Joint Base San Antonio, San Antonio, Texas.

TALENT MANAGEMENT AFTER NEXT

– EVOLUTION OF THE PEOPLE STRATEGY

Printed during the U.S. Army War College 2020 Resident Education Program Academic Year