

Executive summary:

We propose investigating the utility of Assembly, our existing personnel and team capability analysis and matchmaking software, to 1) support the Air Force's mission to develop and field the most lethal force possible 2) help with pilot retention.

The Air Force builds thousands of pilot, maintenance, and support services teams each year, and the success of those teams is determined in large part by whether the right people with the right ranks, skills, qualifications, and experiences are in each role. Building government contracting bid teams is almost identical. To win the contract you need to:

- Identify the hard (e.g. being a Veteran Owned Small Business) and soft (e.g. experience doing similar work) evaluation criteria in an RFP
- Identify how many of the criteria you can meet alone, and your gaps (criteria you cannot meet)
- Search for individuals and companies that you can partner with so that together the team meets all the hard and soft requirements

Assembly helps government contractors do the above and we believe Assembly can help the Air Force with their staffing and pilot retention needs.

Our software works in three stages.



Additionally, with minor extensions we can recommend which incentive and staffing packages would be most enticing for a pilot to stay in. With further extensions we could provide full insight and tracking of the pilot community and overlay it onto the aviation command structure to model and wargame how different retention rates and changes to personnel policy would impact staffing across the force and across time.

Which problem area(s) are being addressed by the solutions

“Today's threat environment requires agile, responsive military and civilian personnel management systems to ensure the Air Force continues to retain the highly skilled talent needed to defend the Nation. Cultivating workforce talent is a priority.” -Lieutenant General Gina M. Grosso Deputy Chief of Staff Manpower, Personnel and Services United States Air Force

Personnel insight and team formation: The Air Force builds thousands of teams a years as Airmen and civilian staff move to new billets and new commands and the success of those teams is shaped by the people in them. The experiences, skills, and capabilities of each team member must complement the others to ensure that all missions can be accomplished quickly and correctly. The current Air Force records system provides lists of schools, qualifications, ranks, and other key data points but we believe that better insights into personnel capabilities could improve the staffing decision process.

Dynamism in staffing process: As General Grosso noted, the Air Force's mission set is evolving rapidly and there needs to be a deep and dynamic staffing support mechanism to rapidly and accurately build the teams that are needed and to complete missions that the Air Force may not even be aware of today.

Insights into the drivers of team performance: Understanding the factors that lead to high team performance is critical when building teams and staffing new personnel. However even good managers have a very difficult time accurately identifying which factors correlate or cause high performance leading to anecdotal or “gut” decisions around staffing rather than rigorous, data driven perspectives on the drivers of success.

Targeted personnel development: While the Air Force has a robust training pipeline for each billet, by necessity that pipeline was built to meet the typical needs. However, no person, team, or mission is typical, so tailored training is needed to fill gaps on the team, or to meet an unusual requirement. “More than an entire generation of Airmen have prioritize operations over training. Our aircrews are not able to maintain full-spectrum readiness

against all threats with these conditions.”-Lieutenant General Gina M. Grosso Deputy Chief of Staff Manpower, Personnel And Services United States Air Force

Pilot retention: There is a significant pilot shortage across the Air Force driven in part by the struggle to align the opportunities and requirements of different billets along with incentive packages to the desires and capabilities of each pilot. “At the end of FY 2016 the total force including active, reserve, and guard components was short 1,555 pilots across all mission areas.” -Lieutenant General Gina M. Grosso Deputy Chief of Staff Manpower, Personnel And Services United States Air Force

Strategic pilot staffing: The Air Force has thousands of pilots and hundreds of billets with complex interdependencies (e.g. for a pilot to assume a particular command billet they have to have a certain suite of skills and experiences) making long term staff planning and anticipating the impact of changes to advancement and personnel policies difficult.

Give examples of which government customers would likely be able to utilize the solution(s)

Likely Air Force customers: Air Force Personnel Operations Agency; Air Force Manpower Analysis Agency; any command that would like more insight into their staffing, training, and readiness.

Non-Air Force customers: Each of the other branches have identical staffing, training, and readiness requirements making each of their manpower offices a likely customer.

How they will apply to the US Government’s needs

Assembly: Assembly is a skills-based social network that provides more relevant, more comparable, and more trackable information about individuals and teams than existing networks and solutions. A pilot group of government contractors are already using Assembly to rapidly and accurately understand their own and peer team capabilities, and how different configurations of companies, and individual hires could be brought together to meet the requirements within, and win, government contracts. Assembly has dramatically reduced the time required to build high-quality teams and identify new hires, which in turn has allowed them to go after more work and grow rapidly.

Personnel profile development: (in this section we described the technical approach to developing profiles)

Standard approaches to personnel profile development: The foundational tension in personnel analysis is in how to create a 1) detailed, 2) accurate, 3) searchable, and 4) predictive perspective on people.

- **Category-based approaches (AFSC approach):** Many personnel management systems, including AFSC codes and qualifications, take a category-based approach to profile creation.
 - **Pro:** The advantage of this system is that it is simple to implement (you just need a list of all the categories), it is easy to search, and it is generally accurate when asking standard questions (e.g. show all pilots that are C-130 qualified). Additionally, these systems can be predictive, e.g. by knowing that a person is a C-130 pilot I can predict that they have other skills (e.g. Navigation and Planning) even though they were not specified.
 - **Con:** This approach is not precise. A person may be put into a category without meeting all the criteria (e.g. there was no C-17 category so the person was put into the C-130 category), and/or they may be able to do a wide variety of things outside that category. As a result searches based on categories frequently return many false positives while missing many candidates.
- **Tags based approaches (StackOverflow, LinkedIn):** Another common approach is to associate capability keywords or “Tags” to a person’s profile (e.g. Tag: Pilot, Tag: C-130, etc.).
 - **Pro:** This approach can be very precise because the keywords can be tailored to the exact capabilities of the individual.

- **Con:** This system suffers because different people frequently use different keywords that mean the same thing forcing searchers to guess at all the different keywords that could have been used making search very cumbersome or inaccurate. Second this system is only as good as the data entered into it, and users are notoriously unwilling to invest significant time filling out profiles leading to inaccuracies and data loss. Third, these systems are not predictive, e.g. if someone tags themselves with “C-130” we do not necessarily know that they are also a “Pilot” without that tag being added as well.

- **Our approach:** [Redacted]

(Image/schematic to illustrate our approach)

Our approach has all the benefits of the Category and Tags based approaches with few of the cons:

- **Accurate search:** [Redacted]
- **Predictive:** [Redacted]
- **Customized:** [Redacted]

Team profile development: [Redacted]

Search: The third key element of our platform is the ability to search in two ways:

- **By capability:** [Redacted]
- **By requirement:** [Redacted]

The breadth of applicability of the solution(s) to the US government

Personnel insight and team formation support: [Redacted] This would help ensure that the optimal Airmen or civilian was moved to that team to compliment the particular strengths, weaknesses, and needs of that teams to maximize performance.

Dynamic staffing: For new teams that do not have formal requirements and billet descriptions we can take unstructured information about what the team needs to do and what outcomes are expected and Assembly can predict which professions and skills could best achieve those outcomes and identify and assess the “fit” of different personnel. This would allow staffing planners to more effectively build impromptu teams.

Insights into the drivers of team performance: If we are given information about which existing teams are high and low performing we can identify variables that appear to be correlative with team performance (e.g. distribution of profession waypoints, years of experience, depth of skills, etc on high and low performing teams). Once we have a list of potentially causal factors we can work with the Air Force to test them to validate which ones are reliable drivers of team success. This list will help Air Force staffing planners assess why teams are underperforming,

identify people who are strong or weak in various success factors, and make more informed staffing decisions to maximize performance.

Targeted personnel development: If we can analyze a large number of teams in a particular area (e.g. maintenance teams) we will be able to create a baseline of skills, capabilities, professions etc that teams should have. We will also be able to identify variances across teams. Once the variances are identified we can make recommendations for the training, development and staffing that would be needed to bring low performing teams to the baseline.

Pilot retention: With simple extensions to the mechanics that we use for skills assessment we can develop a “pilot desires” criteria that measures each pilot against factors that drive retention (e.g. how much they value compensation v. flight time, v. advancement v. time with family etc.). Similarly, pilot billets could be evaluated based on their likelihood of meeting those desires. With this information, retention and billet packages could be structured to best meet a particular pilot’s desires.

Strategic pilot staffing: Using our existing analysis process we can overlay our understanding of the current pilot landscape onto the billet and command structure of the Air Force to build a comprehensive model of pilot staffing and progression including mapping dependencies between roles. This would allow us to map how people move through the advancement and staffing system over years and would allow the Air Force to model the impact of different advancement models, retention assumptions, changes to career dependencies, etc. on long term pilot staffing and billet coverage.

The solution(s) should also be evaluated for cost and feasibility of being integrated with current and future complementary solutions

To minimize integration cost we would recommend using our existing Amazon Web Services (AWS) based system which is FedRamp certified. Classified information can be layered in using a high side mirror of the unclassified system which would live in a walled sandbox on Air Force systems. While we do not anticipate significant costs this will be evaluated in Phase I with customers.

How the solution(s) will be able to address potential future changes in logistics/supply chain technologies and challenges

Because our solution is built in the cloud and can be ported onto FedRamp compliant servers there should be minimal changes due to logistics/supply chain. There will be technology changes as the stack evolves and new functionality is added however we expect to host on AWS minimizing disruption to Air Force clients.

The potential to keep pace with technological change due to things such as other non-DoD applications and customer bases for the solution(s)

Our system was originally built for the government contracting community and as such we are very close to the needs of the DOD customer set. Additionally, all the functionality suggested in this proposal are functions that have been requested by our commercial clients so are top priorities for us to implement and as the Air Force’s needs evolve we can build out Assembly’s functionality to meet them.

Facilities/Equipment

The research in this proposal will be supported by the Eastern Foundry and Federal Foundry facilities, developers, and community. Specifically:

Build out of prototype functionality: The Federal Foundry development team will support the Pilot Desires and billet analysis functionality

Customer identification and interviews: Federal Foundry has access to government market intelligence platforms, the staff teaches classes on Federal market business development, and there are over 200 Eastern Foundry customers that together have a network that will be leveraged to identify and engage customers.

Deliverables

We will provide all reporting deliverables required under this SBIR including our analysis of the viability of all prototype functionality, synthesis of customer surveys, list of customers that are interested in Assembly, and a sales strategy.

Principal Investigator Resume:

Geoffrey B. Orazem (American citizen)

Education:

Harvard Law School , Cambridge, MA, Juris Doctorate	Jun 2009
Officer Candidates/Basic School/Infantry Officers Course , Quantico, VA	Oct 2000
St. Mary’s College of Maryland , St. Mary’s City, MD, BA Computer Science	May 2000

Professional Experience:

The Eastern Foundry, Washington DC, USA July 2014-Present; *Founder, CEO*

- Created an incubator for start-up firms aiming to serve public sector clients
- Product owner and planner for company’s online service offerings, online education and Assembly

McKinsey & Co., Washington DC, USA Jan 2011-Apr 2014; *Engagement Manager*

- Planned, implemented, and oversaw multiple lean transformations (McKinsey approach to 6-Sigma) in the insurance and transportation sectors
- Worked with major US and international companies to develop growth strategies, and resolve structural issues which significantly improved profitability

Iraqi Transportation Network, Iraq, Afghanistan June 2009-Oct 2010 *Tribal Affairs Advisor*

- Helped develop a private, tribally-based transportation company that ran over 4,200 trucking convoys throughout Iraq independently, relieving American soldiers of convoy duty, building sustainable infrastructure, and promoting cooperation among Iraq’s Sheikhs

United States Marine Corps., California Oct 2000 –Oct 2005 *Infantry Platoon Commander,*

- Led a platoon of 59 Marines and Sailors from An Nasiriyah to Baghdad