

# Igniting Innovation by Breaking Barriers to Communication

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## **Executive Summary**

The Air Force does not have an effective communication platform that allows any idea to be shared with the entire service community in near real time. Existing technologies such as Reddit, YouTube, Quora, Github, and Wikipedia with their associated search engines are the answer. There are some associated risks by adopting this technology in regards to security and workforce discipline, each of which can be mitigated by utilizing existing technology and leadership involvement. Platforms such as these have existed within private industry for years and have aided in flattening organizations allowing open collaboration from all levels. The vehicle that will enable adoption of these technologies exists within AETC, a cloud based service with the ability to hastily adopt and contract services. By leveraging the newly available platform the Air Force will be able to catch up to current communication methods employed by the private industry. The vision for this platform is an icon on every desktop of every Air Force networked computer that links any Airmen, regardless of rank into these open systems. With application of advanced two factor authentication, the end goal would be for any member of the Department of Defense to access this platform from any mobile device. Cyber Protection Teams have organically developed this method of communicating innovations out of necessity in order to innovate and better enable their mission. This new-age method of communicating must be adopted by the entire Air Force to allow its innovative Airmen to share and collaborate ideas, in turn breaking down current stovepipe constructs that exist where information gets trapped and lost.

## Background

The “frozen middle” is the term coined to describe the layers of middle management in which ideas or truth data can become lost or mistranslated before being briefed to senior leadership and key decision-makers. A recent case study on information technology companies defines a flat organization as one with "few or no levels of middle management between employee[s] and executives." The study goes on to describe how "the idea is to take advantage of well-trained workers [and get them] more directly involved in the decision-making process," so that potential solutions are not lost in the "various layers of management" unavoidably present in "tall" organizations.<sup>1</sup> So, how could a model like this be applied to our military, where the organizational structure requires multiple levels of command and supervision, which unfortunately have been deemed, “frozen?” Is it possible to flatten the organization or “thaw the frozen middle” into action without completely destroying our current command structure? One way to do just that is through open innovation. Another case study examines the use of open innovation and discusses how it can be manifested through both “product [and] process innovation [to produce] improved ... practices and methods.” The paper defines open innovation as “a paradigm that assumes that organizations can and should use external ideas as well as internal ideas ... as they look to advance”.<sup>2</sup> That sounds great, but how exactly can we induce open innovation in the Air Force? Yet another recent article examined six technology companies that use “free and open source software” as their means to innovate. The authors infer that those companies with a “deeper level of involvement [enable] the exchange of ... like ideas, influences, opinions, and even innovations or parts of them.”<sup>3</sup> The paper goes on to introduce three points of view or “innovation models: closed innovation, external innovation, and open innovation.” *Closed innovation* is the traditional model that relies upon closed-off “internal

research and development (R&D) activities” to produce new products and processes. In contrast, the concept of *open innovation* describes active participation in open source development, and *external innovation* describes the “mere exploiters” who simply take the ideas of others in order to increase their own efficiencies. Only with an open innovation construct does an organization have the automatic benefits of “inter-organizational learning,” “complete visibility” into the community, and “cost and time savings” with regard to process building and innovation. Closed innovation sounds reminiscent of the traditional military “innovation arm,” known as R&D, which can be found in the forms of Project Management Offices (PMOs), Special Project Offices (SPOs), and monolithic research institutions such as the Air Force Research Laboratory (AFRL). Even newer initiatives such as the Defense Innovation Unit Experimental (DIUx) and the Defense Digital Service (DDS) differ from closed innovation only in that they borrow from current industry, similar to what is described by the external innovation model. Open innovation, however, would allow organic solutions initiated and refined by the already capable Air Force community, and it can be done through open-source collaboration. The companies examined by Henttonen et al each facilitate their innovation through open source collaboration systems.<sup>4</sup> Some common ones include products that many readers of this paper have used and even contributed to online: Wikipedia, Reddit, and GitHub, just to name a few. Systems similar to those are being used within successful companies to develop collaborative, in-house solutions subject to continuous improvement.

Air Force Chief of Staff, General David Goldfein, addressed attendees at the Air Warfare Symposium in early 2017 and asked, “Are we the institution ready to accept the great ideas that industry is about to roll our way...or are we an organization [where] the marble dies 15 bureaucratic deaths along the way, [where it] never gets to someone who can take action on it?”<sup>5</sup>

The Chief of Staff of the Air Force understands that while the service has developed many game-changing technologies, we cannot solely rely on internal solutions. Industry continuously develops new ideas and technologies as they try to outperform the competition. The Air Force must tap into these industry ideas without fear of failing. Upon taking office, Secretary of the Air Force Heather Wilson ignited dialogue on a more innovative Air Force, no longer focusing solely on readiness and modernization--"we have to get from concept to warfighter faster"<sup>6</sup>--the question still remains, how? How could the Air Force facilitate open communication, enabling faster innovation across all levels in the Air Force?

The strategic necessity of geographic separation creates challenges to sharing innovation. Airmen both within the same Air Force Specialty Code (AFSC) and across different AFSCs do not have the ability to share information in real time, preventing communal building of a rapidly accessible knowledge-base for education, training, and collaborative innovation. Industry has already created platforms that solve this collaboration problem so prevalent throughout the USAF, and DOD. This experience must be tailored for the current and future workforce generation (those who grew up with the Internet and are accustomed to using it for research and collaboration); products like Wikipedia, Reddit and YouTube get millions of participants daily who are looking for information and collaborative solutions.<sup>7,8</sup> We must adopt products like these to enable our own information-sharing and real-time collaboration moving forward.

## **Discussion**

To remedy the lack of near-real-time communication and breakdown the artificial barriers that obstruct collaboration, we propose that the Air Force implement a web-based, open-source collaboration platform with components similar to Wikipedia, Reddit, Quora, Github, and YouTube that are accessible to all Airmen. These platforms will enable the effective

communication of innovative ideas across all levels of the Air Force. Specifically, we propose that the platform operate as a web page behind a CAC-enabled system that contains links to at least five online services and a platform-wide search engine that can pull search results from each of the five online services. The platform should be accessible by clicking on an icon available on every Air Force or DOD or any government computer.

The first service we propose is one similar to Wikipedia. Wikipedia is a free online encyclopedia wherein anyone can create a new article or edit an existing article. A standard Wikipedia article contains an introduction, table of contents, summary of important information, main body, and references/citations in addition to an edit function tab that allows a reader to contribute to an article. There is also a history section that displays the history of edits and revisions made to each article. While Wikipedia is vulnerable to misinformation because anyone can edit an article, it nevertheless serves as an excellent general reference and orientation guide and can be used as a springboard for conducting additional in-depth or confirmatory research. Further, the large number of contributors helps keep the information within each article as accurate as possible. For example, there are about 10 edits per second committed for over 5.6 million articles.<sup>9</sup>

The second service we propose is a Reddit style page. Reddit is a discussion website wherein registered members may either propose questions for commentary or comment on questions already proposed by other members. Responses can be voted up or down by other members as well, with those comments voted up rising to the top of the discussion and those comments voted down falling to the bottom. Through this system of voting, the better responses or answers generally appear first. Reddit saw approximately 1.7 billion visitors on average for January 2018 with an average of 7.5 discussions viewed per visit.<sup>10</sup> Similarly, we also propose a

Quora style service. Quora is also a discussion forum where questions are asked and answered by a community of users. In Quora, users may collaborate by answering questions or suggesting edits to answers submitted by other users.

The fourth service we propose is Github. Github is a web-based collaboration service primarily focused on computer code and open-source software projects. Through this service, computer programmers from around the world can collaborate on developing software. Within the Air Force, a service such as Github will allow cyberspace professionals or any Air Force hobbyists to do the same.

Finally, we propose BlueTube, a service similar to YouTube, the popular video sharing website wherein users may view, upload, rate, and comment on videos. While YouTube videos are often focused on entertainment, there is a wealth of informational or educational videos as well. For example, YouTube provides videos on how to change the oil in a vehicle, fix the air-conditioning in a home, and change a flat tire, to name but a few. Similarly, Airmen on BlueTube would be able to post educational or how-to videos for subjects related to the Air Force.

Implementing the platform described above will allow tactical “depth” to permeate across multiple domains, eliminate stovepipes of information, and take significant steps towards synchronized operational execution. In the long-run, this system could be expanded to the DoD broadly and enable multi-service communication.

### **Risks to Implementation**

We recognize that any new technological solution is not without risk and apprehension. We have identified the major areas we feel would generate the most friction and potentially be a hurdle to implementation:

## **Training**

Much like academic communities' aversion to accepting Wikipedia articles as viable resources, we recognize that the military community would not want open source, informal information being used as guidance or implemented as policy. These forums are not a substitute for technical orders or Air Force Instruction. Units would have to ensure that members do not treat them as such. However, they can be used to cite authorized directives and enhance the overall knowledge of the of the organization

## **Standardization**

With so many inputs, how will Airmen know what the standard is? Actually with more involved the discussion, the right answer is often found more quickly and can be standardized across the community. Again, this is not to replace AFIs, but it can help identify a potential change that can be addressed, discussed, and corroborated in turn affecting a positive change. It is the same reason we “reply all” to emails and hold so many meetings – we want to know what the collective standard and way ahead is. Open source collaboration accomplishes this much more efficiently.

## **Security**

Inherent to any technological solution is the threat of access to the network. With so much consolidated information, the Air Force wouldn't want unauthorized access to the platforms. Conversations among Air Force members regarding their work are rampant and ongoing across the public Internet in open forums such as the Air Force subreddit and various Facebook groups. Our proposal would enable the Air Force to bring those conversations into a military network, the access to which is controlled by the military. This control would allow us to raise those ongoing conversations to the FOUO, Secret, and even Top Secret levels, if the



platform is hosted on those respective military networks. Our proposal would require two factor authentication (2FA) for users to gain access. Currently, Common Access Cards (CACs) with Public Key Infrastructure (PKI) certificates meet that security requirement. Convenient access from mobile devices is also within the realm of possibility, through the use of software certificates, mobile CAC readers, or third party authentication providers.

### **Cultural**

The DoD has evolved to a culture of emails and sharepoint sites. The technology we are proposing would require a significant cultural shift on the part of the senior members of organizations. We have identified these collaborative tools not only to be the preferred method of the youth of America but will continue to become the adopted best practice moving into the future. Not only will adoption from senior leaders be required but restoring faith in all levels of the Air Force in military technological solutions. Historically, as a service, we have been horrendous at technical communication solutions. These cultural hurdles can be navigated through education of the ease and usefulness of the platforms.

### **Differentiation**

The issue is not that Airmen are not innovative, but rather that the current means of communication are not adequate for near real time sharing of ideas across an entire enterprise. For example, Sharepoint is available for storing data or hanging products, but often the documents on the Sharepoint are tied to the current supervisor or quickly become outdated. Additionally, Sharepoint requires each individual to be granted access and, therefore, instead of promoting information across networks and squadrons it stifles it with restrictions and access laws. The shared drives do not work because you have to be on the network to access them, and once again, the result is often leftover and outdated products. This is not to say that the drives

are not useful, it is just that they are not a means of communication outside of a stovepipe. Air Force Smart Operations for the 21st Century (AFSO-21), was a program rolled out with the intention of standardizing methods to solving problems and sharing solutions across the force. The problem, however, is that the only ideas that made it into the Continuous Process Improvement (CPI) Database are heavily vetted by leadership, preventing raw information from idea originators to get support at the broadest level. The IDEA program has good intent but it is a stovepipe within itself because the failed ideas never had the chance for input at the mass peer level to potentially turn into great ideas.

The user friendly and corporate replica like interface is what will allow this idea to be successful. Everyone that uses Reddit or Quora or Wikipedia all understand the functionality and applicability already. Instead of the Air Force creating an Air Force model, this solution is unique in that it keeps the Air Force out of it, thus promoting innovation but reducing the time it takes to communicate ideas and share knowledge.

This solution allows for input and idea sharing enterprise wide, instead of squadron or wing wide. This is unique because it gives every Airman a voice and as a collective whole and progress will be achieved through joint involvement across the Air Force level instead of the answers to the same question being answered at the every base, every month without ever being shared.

### **Where do we start?**

An organic solution built by Cyberspace Protection Teams (CPTs) already exists as a proof-of-concept on a small scale, hosted on servers located on premises and consisting of web applications such as MediaWiki, phpBB, and GitLab. These three products are freely available analogs to our proposed AF-Wiki, AF-Reddit, and AF-Git. These products effectively enable

open innovation for the CPT community, which consists of no more than 200 users. However, a model like this, comprised of free software, hosted locally, and managed internally, is not sustainable at the scale needed to support innovation and lateral communication across the branch. What the branch needs is a cloud-based suite of applications with high availability for thousands of users and elegant, intuitive user experiences, similar to what one may find on the Internet with Wikipedia, Reddit, Quora, YouTube, and GitHub.

The path to a solution such as this would be relatively simple to traverse. AETC/A5 is currently working to stand up a cloud-based, modular web platform. The modularity would enable various applications with specific purposes to be served to all Airmen. The team at AETC is even looking into modern methods of two-factor authentication that could potentially enable securely implemented mobile device access. The convenience of having mobile device access would allow for vastly increased participation across the branch, which will in-turn enhance the reliability and credibility of the community-sourced information. The Cloud Service Provider (CSP) they plan to use has already undergone the FedRAMP process, a streamlined method for IT services to gain Authority to Operate (ATO) and approval to house government information. The collaboration services we have described could be hosted in the modular space being worked by AETC/A5. The next step would be to formally outline our vision as a set of requirements, so that contracted developers could build those services to be hosted by the CSP.

## **Conclusion**

The Air Force does not have an effective communication platform that allows any idea to be shared with the entire service community in near real time. The Air Force needs to adopt a platform that caters to the current and incoming generations, with the look and feel of existing applications. Embracing existing technologies such as Reddit, YouTube, Quora, Github, and

Wikipedia with their associated search engines is the answer. There are some associated risks by adopting this technology in regards to security and workforce discipline, each of which can be mitigated by utilizing existing technology and leadership involvement. The vehicle that will enable adoption of these technologies exists within AETC, a cloud based service with the ability to hastily adopt and contract services. By leveraging the newly available platform the Air Force will be able to catch up to current communication methods employed by the private industry. Cyber Protection Teams have organically developed this method of communicating innovations out of necessity in order to innovate and better enable their mission. This new-age method of communicating must be adopted by the entire Air Force to allow its innovative Airmen to share and collaborate ideas, in turn breaking down current stovepipe constructs that exist where information gets trapped and lost.

## End Notes

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