

Innovation: Beyond the Buzz-Word

Why and How a Major Change is Required to Ensure National Security

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The world is undergoing a never before seen transition from a hardware-based society to one where software is playing an ever-increasing role.¹ As such, the United States Air Force (USAF), the entire public sector, and a large portion of private industry known as the military industrial base must adopt processes and methods to overcome stagnation and remain relevant during these tumultuous times. At the core, is a cultural shift involving drastic fundamental changes which will invariably prove difficult to implement, especially in long-standing bureaucratic organizations such as the military. The process of innovation can aid not only in developing the solutions required to successfully transition but, more importantly, it will foster a growth mindset required to adopt such wide-sweeping changes. Additionally, organizational changes will be required to implement the ideas that stem from this culture change. To begin, a brief overview of a generic innovation process is presented, followed by the analysis of a current case study. Lastly, a projection of future innovation implementation is used to illustrate how not only individual units can innovate but also provides a model of how large organizations can benefit from the process. First, a few definitions serve as the starting point and set the stage.

Innovation can take on many definitions but for the sake of this discussion will be described as executing an idea which addresses a specific challenge that achieves value for both the organization and end user.² Additionally, innovation has been deconstructed in a number of models, most of which are useful and all of which are imperfect. One such model is from Satell of the Harvard Business Review in which he applies a two-by-two matrix with domain definition on the x-axis and problem definition on the y-axis, both ranging from 'not well' to 'well'.³ When both variables are not well defined the "Basic Research" type of innovation applies with academic partnerships, journals, conferences, etc. When the domain is well-defined but the problem is not, this is where "Disruptive Innovation" consisting of venture capital model and

innovation labs can be applied. If the problem becomes well-defined and the domain remains clear then this is where “Sustaining Innovation” is applicable in the form of Research and Development (R&D) labs, traditional acquisitions, road mapping, etc. Lastly, when the problem is well-defined but the domain is not, this is where the “Breakthrough Innovation” occurs such as in Amazon’s Lab 126 or Lockheed Martin’s Skunk Works. It is important to recall that there is no “true” or “right” path to innovation and that any route will be fraught with failure as innovation is about solving problems.⁴ With that being said, it will require a combination of innovation types to successfully navigate the governmental bureaucracy and leave the Department of Defense (DoD) in a position to meet the National Defense Strategy (NDS) goals. Before setting off on the path to innovation, it is first critical to realize that organizations are little more than groups of individuals and therefore leaders must maintain at least a basic understanding of human personality traits and how they interact.

A number of models are available to assist in quantifying and comprehending the vast number of personality traits into easily understandable, relatable, and, most importantly, memorable groupings. As mentioned above, every model has its strengths and weaknesses, and the same phenomenon exists when analyzing personality types. Of the many to choose from, the “5 Voices” model presented by Kubicek and Cockram applies an intriguing approach by presenting not only five bins in which to characterize individuals and their traits but expands the analysis with recommended techniques for leveraging their differences. The 5 Voices and their respective percentages are the Pioneer (7%), the Connector (11%), the Guardian (30%), the Creative (9%), and the Nurturer (43%).⁵ This model closely parallels others such as the Meyers-Brigg Type Indicator (MBTI) but maintains an ease of application similar to the Competing Values Framework (CVF). Regardless the model, most benefit stems not only from self-

awareness and how to best employ individual traits but, perhaps most importantly, from the realization of other personality types and how they interact. When understood and properly employed, personality traits (i.e. voices) work together in a complimentary fashion by filling in gaps between the various types. As the ultimate resource, it is imperative leaders fully leverage the human capital of their organization by communicating, both listening and speaking, in the correct voice to all personality types. In order to successfully accomplish this feat, one must first be aware of their own strengths and weaknesses and then work to accentuate the former while hedging against the latter.

A leader must be self-aware of their own personal character traits in order to leverage those characteristics by first leading themselves before leading an organization. As a leader, a critical first step is to determine and subsequently master what the 5 Voices term a foundational voice; that is, the one preferred voice that is most natural and therefore easiest to speak and understand.⁶ Each voice has advantages and disadvantages which lead to a set of rules of engagement for each type: Nurturers must feel safe, as if their opinions are desired, and that no one will immediately critique their ideas.⁷ Creatives must be able to dream big and have clarifying questions asked about their ideas.⁸ Guardians need to keep asking the difficult questions and must remain engaged as long as possible.⁹ Connectors must not take critiques personally and should passionately promote their ideas.¹⁰ And lastly, Pioneers must listen to everyone else's views first before offering their own opinion and must be aware of the strength of their critiques and speak with empathy.¹¹ Understanding personal character traits, be they strengths or shortcomings, form the basis for creating and managing a team to its full potential.

Creating teams of individuals with differing personality traits will allow a healthy level of dissonance and spur development of breakthrough ideas necessary to meet objectives.¹²

Although difficult in an organization such as the US military where units are largely a random selection of individuals, leaders can maximize performance of their personnel by understanding and accommodating the traits of their team. Knowledge and awareness are the first step in identifying gaps created by missing personality traits. Once realized, overcoming subsequent issues stemming from these gaps can occur in a number of ways. The formation of an advisory group of Pioneers and Creatives, often from outside the organization, allows an objective view that ideally creates a solution behind which every type of personality can support.¹³ Another method, that requires no outside assistance, is to assign individuals from the team to assume the role of the missing personalities and play the role of devil's advocate. It is especially important to consider the Nurturers and the Guardians as together they makeup over 70 percent of the population and are therefore critical to an organization's success.¹⁴ It is this concept of competing values within an organization that serves as the underpinning of the innovation cycle and the successful transition through the various phases.

While flexibility is key to the successful application of any model, an underlying framework of innovation serves to keep an organization on task and progressing logically towards a desired end-point. One such model is from the Stanford University's d.school of business which consists of six major steps: empathize, define, ideate, prototype, test, and assess.¹⁵ While presented linearly, the true power of this model is derived from the alternating convergent and divergent phases as well as from the iterative ability to re-visit previous steps and thereby allow for continual incorporation of feedback. Empathy, as the foundation for this human-centered design process, is a divergent process consisting of observation, engagement, and immersion. One of the best methods for completing these steps within military organizational confines is to gain personal experience through temporary duty with the end-user.

Another method is the conduct of empathy interviews focused around a certain topic but with largely undefined agendas. The desired end-state of the empathize phase is to uncover known as well as unknown needs and guide innovation efforts towards those ends through an increased understanding of the user's emotions and operational environment.¹⁶

Only once the empathize phase has been sufficiently exhausted and unpacked can problem statement framing begin. The define phase, as it's known, is a convergent focusing stage during which the information gathered from the previous empathizing phase is analyzed and an actionable problem statement is formed. During this phase a deeper understanding of the users allows the formation of an actionable problem statement, sometimes referred to as a point of view. Open-ended statements such as: We met..., We were struck by..., and We wonder if this means..., are all tools to capture and distill what was learned during the empathy gathering phase in the eventual goal of creating a "How might we..." problem statement.¹⁷ Also develop at this point is a quick pitch to gain someone's attention and ideally support, also known as an elevator speech. It is this well-defined point of view which allows for a follow-on divergent thought process to produce wide-ranging but applicable solutions during the ideate phase.

The goal of the ideate phase is to flare and create as many radical ideas as possible to solve the problem statement developed during the previous definition phase. This signifies a shift from the problem space to the solution space and necessitates and commensurate change in mindset as well. Not only should the ideas be far-fetched and wide-reaching but there should also be as many as possible. There are many techniques used for brainstorming but the underlying concept consists of keeping an open mindset, building on previous ideas with "yes, and..." statements, and putting all criticism aside. Thinking beyond the obvious and without applying constraints is important to obtaining the necessary volume and variety of ideas to adequately

solve an issue. Once the generating phase is complete, then ideas can be evaluated for their potential and not necessarily their feasibility; it is important these two steps remain separate so as to maintain a free-flow of ideas during the generation process. As part of the evaluation process, ideas should be grouped and voted upon. One method of voting is to use three colors: red for the idea that would most delight the stakeholder or end-user, yellow for the most disruptive, and blue for the one each individual finds interesting enough to work on around the clock.¹⁸ Once down-selected, the lead idea is taken forward to the convergent prototype and test phases.

The prototyping phase signifies a transition from concept to real-world during which ideas become relatable. The physical shape and details of the prototype will be commensurate with the level of sophistication and development of the problem statement and solution idea. The true value of any prototype is the feedback gained from physical interaction from the design team and end-users. In addition to testing the functionality of a single idea, prototyping also allows for gaining empathy, exploration, and inspiration. The final phase, testing, is closely-coupled with prototyping as they share many goals: fail early and often, refine solutions and future prototypes, learn more about the user, and refining the problem statement. Feedback obtained during testing should answer a couple core questions: did we listen to the customer? and did we address the problem? Only once these two questions are answered in the affirmative should further development and scaling be entertained.¹⁹ In the event tweaks are necessary, the iterative nature explicitly clear between prototyping and testing can be extended equally to the remainder of the innovation process to yield a better fitting solution.

In order to successfully implement such an innovation process in the US military, both an open mindset at the individual level as well as a supporting organizational structure must coexist. While not trivial, a cultural adoption is largely contributed to by the individual mindset and

becomes largely an issue of education and training built around understanding the process and various personality types, as discussed above. The required supporting organizational structure, especially within the military, is a large change if implemented anywhere above the Squadron level. Author, Safi Bahcall, titled his book, *Loonshots*, and defined the term as a neglected project, widely dismissed, its champion written off as unhinged.²⁰ He further refined the concept with two types of loonshots: a product or P-type as a technology that was widely dismissed before ultimately triumphing and a strategy or S-type as a new way of doing business, or new application of an existing product, which involves no new technologies.²¹ Ultimately, Bahcall advocates the military adopt an S-type change in the form of an updated structural system in which a new way of doing business keeps good teams from killing good ideas. He proposes this organizational change take form as an innovation or futures command and should be independent from the individual services as well as separate from the current research and development efforts already in the DoD.²² Even if applied at the service level in lieu of DoD-wide, the theory remains the same. His idea to develop an organization responsible for initiating innovative surprise is built around three skills and seven principles.

At the core of Bahcall's argument is the necessary dissonance between what he calls 'artists', who develop loonshots, and 'soldiers,' who work on franchising.²³ In order for a large organization, like the military, to realize breakthrough innovations there must be a balance between the two types of individuals and both must be adequately incentivized. Consider this the real-world application of the CVF or the 5 Voices models described above. Any such organization would require a high-level of what he coined phase separation between the artists and soldiers as well as strong dynamic equilibrium in the form of continuous exchange between the same two groups.²⁴ The three critical skills innovation champions require to navigate the

artists and soldiers are bilingual translation, judgment of product-market fit (PMF), and horizontal influence.²⁵ The bilingual translators serve to close the gap between the two worlds of the creative scientist and engineers and the users of those technologies. This requires a special skillset in which the individuals can maintain technical knowledge and an in-depth understanding of technologies while at the same time relating to end-user issues and translating feedback. The second skill of PMF judgement is implicitly linked to the first skillset as it is gained from living in and executing as a bilingual translator. Assisting in overcoming initial user pushback through simple changes irrelevant to the technologists but critical to the end-users is an example of increasing PMF to the benefit of both parties and avoiding a “false fail”.²⁶ Lastly, the concept of horizontal influence is the ability to persuade peers outside of an individual’s direct reporting chain. This is accomplished by aligning incentives, identifying hidden obstacles, investigating failures and, in general, finding creative solutions to roadblocks.²⁷ These skillsets combine to create an innovation champion, what Bahcall coined an Innovation Sherpa, and should be employed in the aforementioned independent and neutral innovation organization.²⁸

The seven principles he proposes derive from the private sector which is where the majority of innovative ideas have historically generated. First, the new organizations should be organizationally neutral to assist in aligning incentives and maintain trust between the user commands and research organizations. Second, the organization should maintain a dashboard of innovation to identify and track lines of effort within the command. Third, the organization should study and apply best practices through education and training of its innovation champions. Forth, the command should establish a meritocracy-based career ladder with a promotion system aligned with other DoD organizations. Fifth, both the research and user agencies must realize the value of the innovation champion. Sixth, the incentive structure of the

command should encourage risk and speed to fielding. Lastly, and likely most importantly, the organization will require an independent but limited budget authority, comparable to Special Operations Command.²⁹ Between the three individual skillsets and the seven principles of a new organization, should the military, or a subset of it, adopt such a structure it will be positioned to capitalize on the diversity of its population by developing innovative product and strategy solutions to meet the NDS. A review of the USAF's Air Command and Staff College's (ACSC) Innovation Research Task Force (RTF) elective will serve as a transition from the theoretical to real-world application of the innovation process.

Throughout the three-term Innovation by Design (ibD) RTF elective, students of the course were given the opportunity to See One, Do One, and Teach One (SODOTO) with respect to running the innovation model. The teams were constructed to leverage the different personality traits discussed above. Although my teammates were related to the acquisition career field, our various personalities gave enough diversity to successfully navigate the process. We chose the Exceptional Family Member Program as our topic and through the application of the innovation model developed a tiered solution to improve the program for Air Force members and their dependents. The project aligns with the Vice Chief of Staff of the Air Force's Challenge to regain Airmen's time and specifically with two of his three emphasis areas: getting PCS orders and navigating the EFMP.³⁰ The DoD's Military Health System is currently undergoing a massive transformation and as the Defense Health Agency continues to standup the team is working to incorporate the proposed EFMP program updates in the overhaul.³¹ Additionally, the House Armed Services Committee subpanel on military personnel has shown a recent interest in the program by taking testimony from military EFMP families for the first time in a decade.³² Everything points to now being the critical time for an EFMP program update and there is no

better way to gain advocates than through an innovative pitch developed through an innovation design process.

As I contemplate my follow-on assignment from ACSC as a Material Leader, I reflect on experiences in the ibD program and ponder the tangible lessons learned. I will be joining a long-standing program office which are notoriously change averse and organizationally stocked with individuals that have been doing the same job for decades. Although the implementation may be a challenge, there are universal truths I've gathered from the time spent in the ibD program I plan to apply in the organization. First, is to remain aware of my own personality traits and how I should use them to the team's advantage when interacting with others. As a pioneer (i.e. blue, athlete) personality type this will require me to speak less, if at all, and to make every attempt to practice empathy. A logical follow-on will be to gain as much knowledge as possible about the other members of my organization, ideally through education on personality traits and perhaps voluntary personality screenings. Overall, I will need to maintain an open, system-based, growth-mindset by asking how and why while maintaining an awareness of cognitive biases and logical fallacies.

In summary, the DoD must remain relevant during the transition to a software-based world. The innovation based designed process, when employed with a complete and thorough understanding of human personality traits, can increase the likelihood of making this happen. Additionally, cultural and organizational updates are required to accommodate lasting and meaningful change. A theoretical design model and organizational structure were presented and its application summarized in the review of a real-world case study. Lastly, a projected application of the innovation mindset in a change adverse unit was used to demonstrate the universal applicability of the innovation model.

Notes

¹ I wish to thank my fellow students in the Innovators by Design Research Task Force for their thoughtful comments and suggestions. All errors found herein are my own.

² Skillicorn, Nick. March 18th, 2016,
<https://www.ideatovalue.com/inno/nickskillicorn/2016/03/innovation-15-experts-share-innovation-definition/>

³ Satell, Greg. “The 4 Types of Innovation and the Problems They Solve”: URL:
<https://hbr.org/2017/06/the-4-types-of-innovation-and-the-problems-they-solve> (2017).

⁴ Satell, 2.

⁵ Kubicek, Jeremie and Cockram. Steve, 5 Voices: How to Communicate Effectively with Everyone You Lead, John Wiley and Sons, 2016, 7.

⁶ Ibid., 7.

⁷ Ibid., 131.

⁸ Ibid., 134.

⁹ Ibid., 137.

¹⁰ Ibid., 140.

¹¹ Ibid., 143.

¹² Jeff DeGraff, ibD Presentation “How to Win a Bar Fight”, 18 September 2019.

¹³ Kubicek, 172.

¹⁴ Ibid., 57 & 69.

¹⁵ Institute of Design at Stanford, d.school Bootcamp Bootleg, URL:
<https://dschool.stanford.edu/resources/design-thinking-bootleg> (2020).

¹⁶ Ibid., 1.

¹⁷ Ibid., 2.

¹⁸ Ibid., 3.

¹⁹ Ibid., 4-5.

²⁰ Bahcall, Safi. Loonshots: How to Nurture the Crazy Ideas that Win Wars, Cure Diseases, and Transform Industries, St. martin’s Press, 2019, xiii.

²¹ Ibid., 66.

²² Safi Bahcall, URL: <https://warontherocks.com/2020/02/the-case-for-a-unified-future-warfare-command/> (2020)

²³ Bahcall, Loonshots, 38.

²⁴ Ibid., 38-44.

²⁵ Bahcall, War on the Rocks article.

²⁶ Bahcall, Loonshots, 59-60.

²⁷ Bahcall, War on the Rocks article.

²⁸ Bahcall, LEDx 3.0, 6 March 2020.

²⁹ Bahcall, War on the Rocks article.

³⁰ 2020 Vice Chief's Challenge - Saving Airmen Time. AFWERX YouTube Channel. URL:
<https://www.youtube.com/watch?v=oWG8hpErKkI> (2020)

³¹ URL: <https://health.mil/Military-Health-Topics/MHS-Transformation>

³² URL: <https://www.stripes.com/news/us/military-families-to-address-congress-about-troubled-dod-program-for-special-needs-children-1.617582>