

U.S. Air Force Career Field Management at the Intersection of Futures Studies and Systems Thinking

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ABSTRACT: Air Force practices of career field management have yet to adapt to the volatile, uncertain, complex, and ambiguous (VUCA) environment that it is increasingly encountering. This paper augments established Air Force management practices with tools and techniques pulled from futures studies. A case study and the agent-based approach was used to recommend the futures practice of horizon scanning and gaining more inclusion from voices throughout the career field.

Keywords: DSRP Theory | Systems Thinking | Futures Studies | Organizational Management

DISCLAIMER: *The views expressed in this paper are those of the author and do not necessarily reflect the official policy or position of the United States Air Force Academy, the Air Force, the Department of Defense, or the U.S. Government.*

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Introduction

In 2015, the United States Air Force (USAF) spent over several million dollars on a manning decision. Despite coming changes to how Air Force Cryptologic Language Analysts—known colloquially as linguists—the career field managers (CFMs) at the time continued to train Turkish linguists by the dozens. By the time word had finally come through that they were cutting all of their positions for Turkish Linguists, they had trained an additional three dozen personnel. Considering that the cost of training a linguist is at least 175 thousand^{1,2} dollars per person, the USAF spent the amount above on training of individuals, many of which never went to operationalize their skillset.

The role of a CFM in the USAF is to manage trained personnel, to make retention and accessions decisions, and to evaluate training for the career field, all the while responding to the present and future needs of the career field.³ It is this last point that proves fundamental. In the story above, CFMs were so blinded by the tyranny of the present, unable to deal with accelerating change, and inundated with an increasing amount of information that they

¹ Walsh, S. (2014) Special forces language training: What would it cost to do it right?

² This number is based on the method of calculation derived from Walsh, it is an approximation; where no documentation on actual price of training exists

³ (2018) Afi 36-2618, *The Enlisted Force Structure*, Technical report



were unable to make strategic fiscal decisions that would have more properly managed talent.

The accelerated nature of change, information overload, and a bias for immediate action has severely reduced the effectiveness of the traditional USAF career field planning process. My recommendation for CFMs of the Air Force is to become navigators of volatility, uncertainty, complexity, and ambiguity (VUCA) through the integration of tested strategic foresight practices. Specifically, advocating for the adoption of part of the participatory futures framework adapted by Air Force CyberWorx (CWx). The following section will introduce you to the framework by highlighting a case study carried out for the 1D7 (Cyber Airman) CFM team and then share the agent-based approach developed by Drs. Laura and Derek Cabrera to deepen our understanding. With this collective understanding, there will be specific strategies CFM teams can implement toward a more future-resilient approach.

A Nature of Change

THE AIR FORCE SEEKS CONTINUOUS IMPROVEMENT, and its personnel focus on change. Demands from all levels of the Air Force speak of the need for change, and this comes from our highest ranking officer, the Chief of Staff of the Air Force, General Charles Q. Brown. In one of his first written addresses to the Force, General Brown stated that the Air Force needs to "Accelerate change or lose."⁴ Others demand changed based on some type of adversarial gap between China and/or Russia and the U.S., as indicated by the "Or lose" portion of General Brown's address; some up the ante by stating that these adversaries have left us behind.

⁴ Brown Jr, C. Q. (2020) Accelerate change or lose, (United States Air Force), Technical report

The internal call for change is not the only kind of change happening. American author and futurist Alvin Toffler was notable in his writings on the disorientation and stress of information overload as it relates to accelerating change.⁵ However, if we use sociologist William Fielding Ogburn's model of social change, we see that the last part of a society to adopt to a specific change is its governmental institutions. Ogburn's model ties together the relationship between "mechanical" and social invention and explains that a common pattern of social change is "for the technological change to effect first an economic organization which, second, causes a change in some social institution, such as the family or government..."⁶ This reveals a bit of a thorny situation: there is a demand of change on behalf of Air Force leadership in response to adversary competition—and the resulting push at all levels of the Force in response to their call—the fact of change

⁵ Toffler, A. (1970) *Future shock*. (Bantam)

⁶ Ogburn, W. F. (1936) *The Journal of Business of the University of Chicago* 9, 1-13

accelerating, and the lagging position that governmental organizations fall into in terms of technological social change according to Ogburn's model.

Air Force CFM teams are left without tools to gain a handle on the accelerated pace of change and the speed and volume of information. Top this off with a preference for immediate action in staffing situations that are becoming more connected with other parts of Air Force systems, and we have a recipe for bad things to happen. There is an important point to note here, however: this paper is not to say that CFM teams are not doing their jobs, but new factors need to be considered for them to excel in this VUCA domain. What are they to do?

Case Study: Cyber Airman Futures Project

Overview

THE CYBER AIRMAN FUTURES PROJECT came to us from a desire to complement short-term analysis. The CFM team was already working a number of efforts toward situating the career field around current realities. Part of this was a near term analysis looking at what ways the career field needed to evolve to address the need for Cyber Airman to work in an operational capacity vice a supportive capacity.

Grounded in understanding current realities illuminated in short-term analysis, and augmented by our own user interviews, the CWx team adopted a futures methodology. The futures methodology employed at CWx is a process of horizon scanning—or searching for trends and “signals” of signs of change—understanding the present situation in a group setting, and finally scenario-making which generates strategic insights.

Process

IT IS IMPORTANT TO HIGHLIGHT THE PROCESS of this event, as the specific recommendations for CFMs are informed in part by the development of our participatory futures process. While any linear depictions of a process fall short, given the current medium, a linear explanation will be a good starting point. The CWx participatory futures process is a process of horizon scanning, pattern analysis, understanding the problem situation, scenario development, backcasting, and generating insight. The sections below will describe each component of the process.

Process: Horizon Scanning

HORIZON SCANNING FOR THIS EXPLORATION is defined as a means of looking toward currently underdeveloped, poorly understood threats and opportunities to decide which opportunities to further explore (Sutherland, 2009). While there are many methods, we at CWx have adopted the one developed out of The Futures School (TFS). The Futures School is an ecosystem which aims to democratize foresight practices. They do so through various learning engagements and setting up futures certifications which had only existed sparsely before. TFS frames their method of horizon scanning as occurring at the macro, meta, and micro levels.⁷ The macro level relates to the overall external environment. At this level the method employs STEEP (Societal, Technological, Economical, Environmental, and Political) analysis to understand what might be on the horizon on these fronts. The meta level refers to the organization's industry, and lastly is the micro or organizational environment.

⁷ School, T. F. (2020) The 3 environments of foresight

Within the context of the Cyber Airman Project, we used previous efforts from horizon scanning and combined that with a look into both the meta and micro levels (what is on the horizon in the cyber industry, and what is going on within the Air Force). After understanding specific trends, we coupled these trends into more general, named patterns. We took this information and used part of it to design the workshop sessions that will be mentioned in the following sections.

Process: Understanding the Problem Situation (Start of Workshop)

The wording and part of the understanding of the way we execute in this area are informed by Peter Checkland's book *Systems Thinking, Systems Practice*.⁸

⁸ Checkland, P. (1999) *Systems thinking, systems practice*. (John Wiley, Chichester, England), New ed. edition

Checkland referred to problem situations rather than a specific problem, as he viewed the utility of his particular methodology as being applicable in unstructured problems where there isn't a clear solution. Taking on this lens of not having only a single lens to the problem, we began our workshop using an inquiry-based approach in getting people to explore the status quo. This status quo included the positive as well as the negative to make sure participants had space to consider both. Figure 1 shows the outputs of these exercises.



Figure 1: Outputs of Status Quo Inquiry

After, we had the workshop participants ideate on what problems were most important to tackle for the sake of the future of the career field. Participants then categorized and voted on the top-priority categories that emerged from their ideation. (See Figures 2, 3, and 4.)

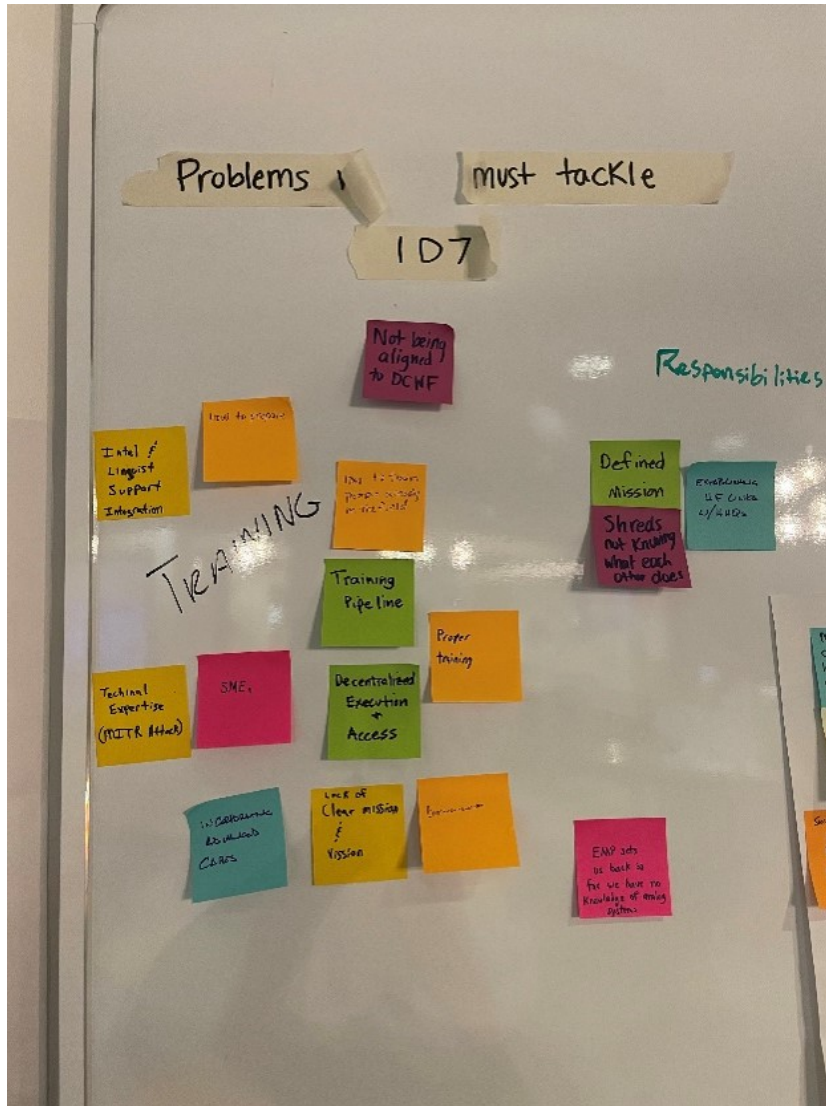


Figure 2: Key Problem Spotting and Clustering 1

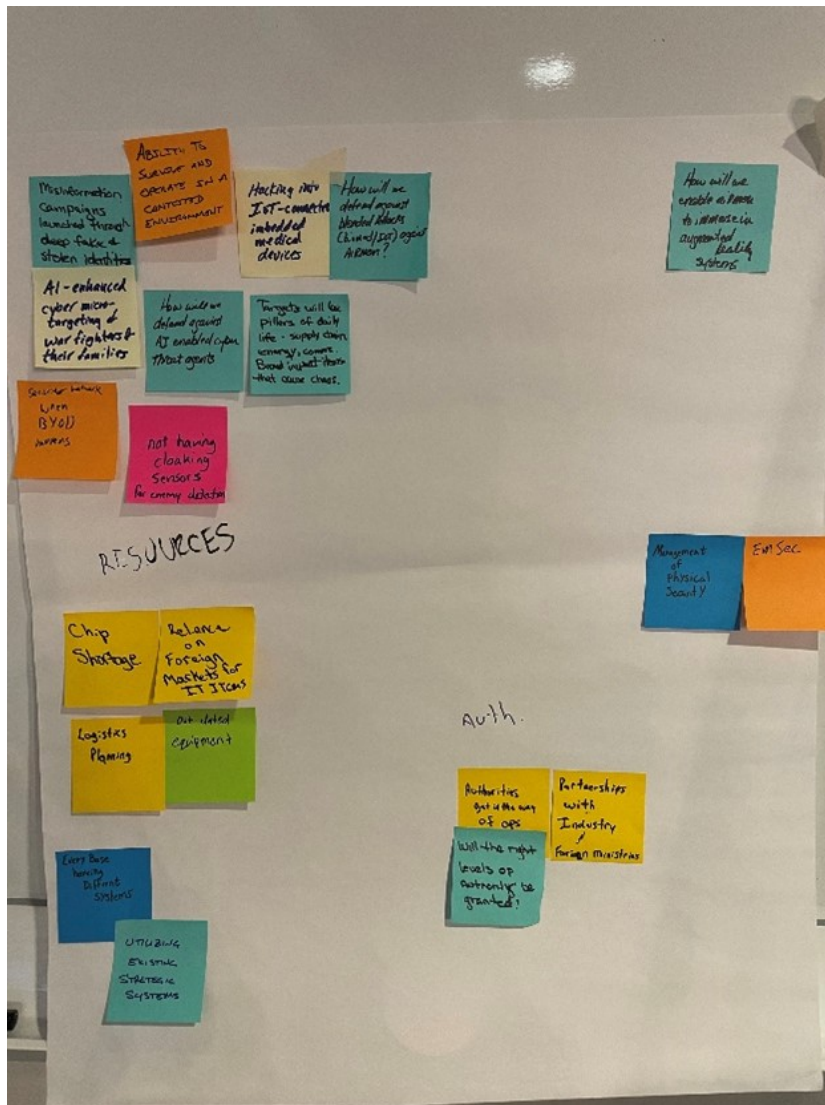


Figure 3: Key Problem Spotting and Clustering 2

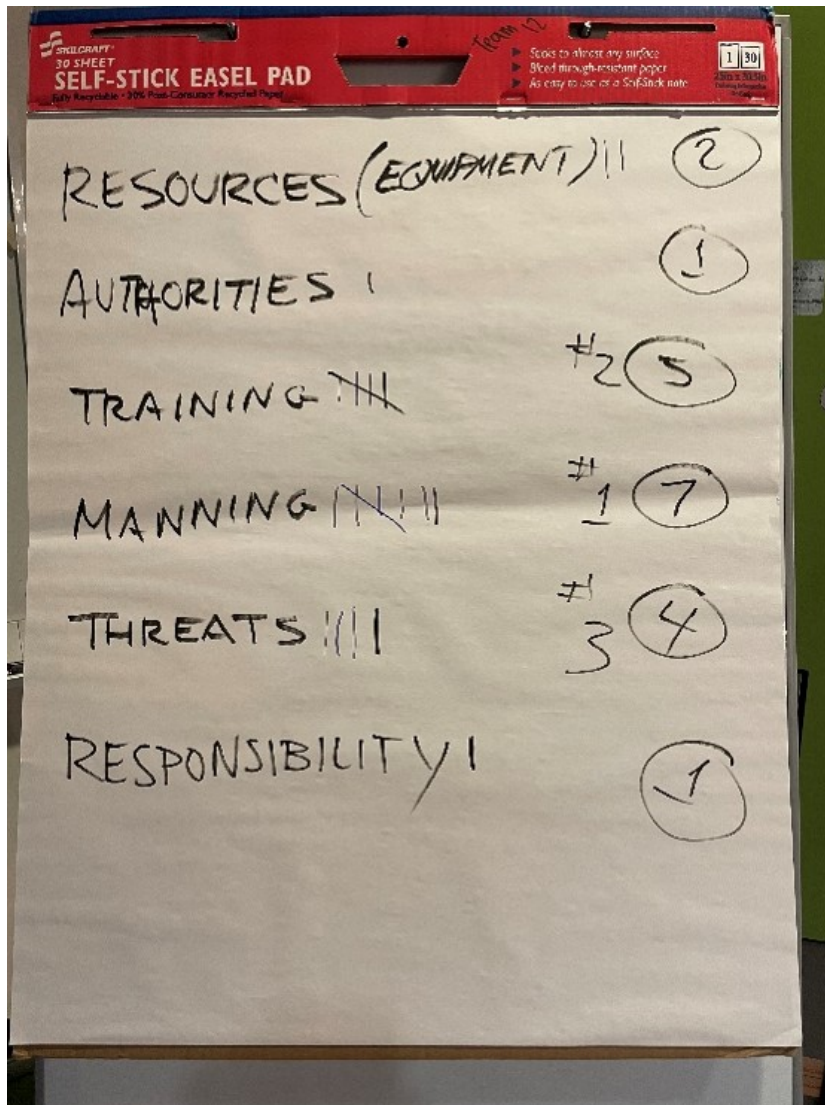


Figure 4: Voting on Problems

Process: Scenarios

ALL OF THE STEPS PRIOR TO THIS SERVE AS INGREDIENTS for scenario-making as the final activity. Our concept for scenario-making was based on futurist Peter Schwartz's method of making scenarios.⁹ In his book *The Art of the Long View*, Schwartz argued that the purpose of making scenarios of the future is not to predict the future but rather to expand the view of the possible and make better decisions in the present. Building from this idea, the group was separated into four different groups which produced four vastly different scenarios. A thematic analysis was conducted after the fact to find major themes within all of the scenarios. The specifics, however, are outside the scope of this paper, as the final recommendations will not involve scenarios.

⁹ Schwartz, P. (2012) *The art of the long view: planning for the future in an uncertain world*. (Currency)

Modified Agent-based Approach

THE AGENT-BASED APPROACH (ABA) used in the following sections is informed by the work of Drs. Derek and Laura Cabrera. It is defined as "an approach to systems understanding, problem solving, and analysis-synthesis of various kinds (e.g., process, policy, systems, etc.) that utilizes a Complex Adaptive System (CAS) perspective as a frame; a specific step-wise method for approaching a given system or problem."¹⁰ Some might be inclined to confuse this with agent-based modeling, and that is not without reason. The difference between agent-based modeling (ABM) and agent-based approach is that ABA can be considered a "soft" application of ABM. According to Laura and Derek Cabrera of Cabrera Research Lab, ABM is limited in what it can accomplish as the level of specificity needed will not always be feasible.¹¹ The next section will walk through this method using the CFMs as an example, and in doing so, will further develop the need for an anticipatory, futures-focused lens to career field management.

¹⁰ (n.d.) Agent based approach (aba)

¹¹ Cabrera, D & Cabrera, L. (2022) *Systems thinking daily office hours* (introduction to aba)

Mapping and Testing Model

To understand the career field management responsibilities as a system, I first looked at the definitions as expressed in Air Force Handbook (AFH) 36-2618.¹² Though this document is now officially out of date, the document which replaced it removed the CFM-related content. The definitions expressed in the document were mapped out in a software called Plectica which was specifically designed with systems mapping in mind. Each responsibility became a node where I then expressed connections and components of

¹² (2018) Afi 36-2618, *The Enlisted Force Structure*, Technical report

subsystems. After this initial mapping, I put it in front of CFMs to get the model closer to the reality of their lived experience. The feedback they provided further refined my map and also resulted in an additional source, Air Force Manual (AFMAN) 36-2100.¹³ With that combined feedback, I updated the map until we arrived at the map expressed below in Figure 5.

¹³ (2021) Afman 36-2100, *Military Utilization and Classification*, Technical report

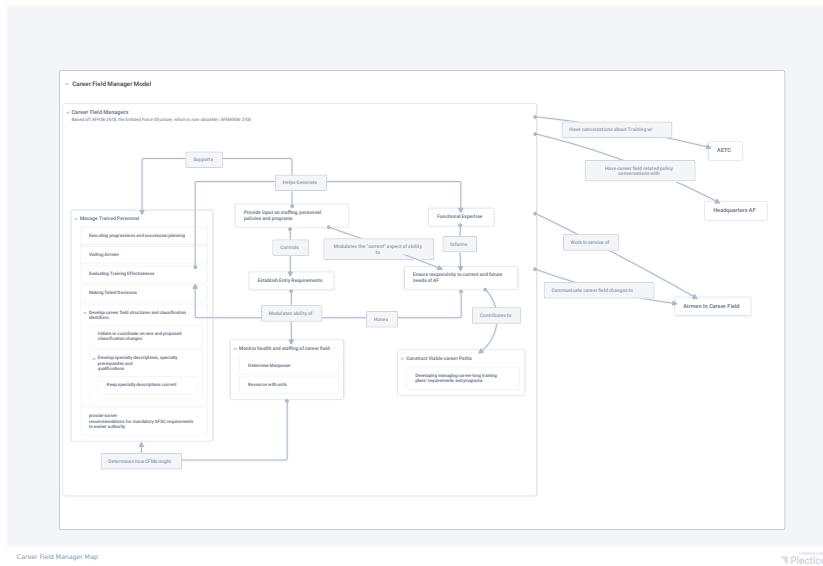


Figure 5: Career Field Management Map

A Deviation

Between the first step and the next, I have thrown in an additional step. As I refined my map, I saw a very clear feedback loop in the behavior that was related to the idea of “current and future needs.” I decided to focus on that loop. In other words, the CFM model above created a new model. This model turned out to express how the Air Force engages in the improvement of a career field. I didn’t want this model to reflect my biases, however. So, just like in the previous step, I put this in front of Air Force CFMs to go over. The result is the Air Force Career Field Improvement Model depicted in Figure 6. For my ABA approach to continue, I needed to decide what system was going to be my scope of focus. As such, I decided that the career field improvement model would scope the rest of this analysis.

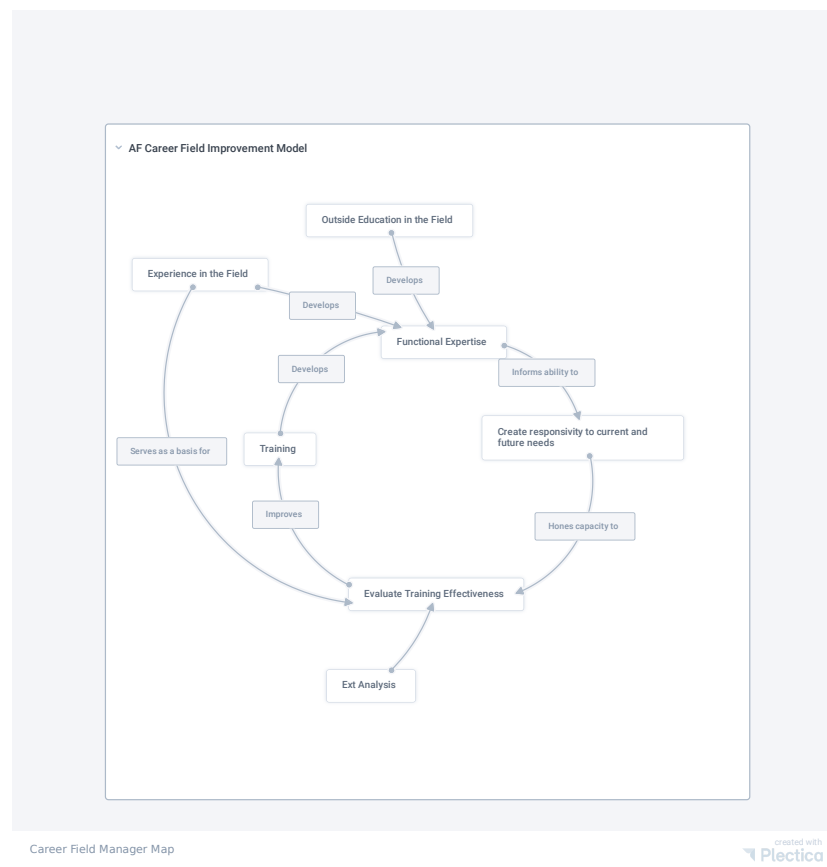


Figure 6: Career Field Improvement Map

This map expresses that the Air Force improves career fields in four primary distinctions: training, functional expertise, creating responsively to current and future needs, and evaluating training effectiveness. These are structured as a feedback loop where one

develops, informs, or in some way augments the next. This feedback loop is supplemented by three distinctions that are outside of this primary feedback loop: outside education in the field, experience in the field, and external analysis. Outside education further develops functional expertise, experience in the field develops expertise but also serves as a basis for how the Air Force evaluates training effectiveness. Lastly, Air Force systems often rely on external analysis through contractors and the like to further augment their training evaluation.

System Determines Behavior (SdB) Analysis

To see how to change this system, I first needed to understand what kind of behaviors this system induces. This line of thinking is based on systems scientist Peter Senge's,¹⁴ and more specifically environmental scientist Donella Meadow's¹⁵ work which mentioned that different people in the same structure will tend to produce similar outcomes. If different people produce similar results within the same system, then we should be able to see from the system that we have mapped what kind of behavior to expect with a certain degree of accuracy. The goal of SdB analysis is to look at the structure of the system and determine what behavior manifests from that structure.

We can determine a few things immediately from the description of the system. It prioritizes a specific individual's expertise and experience instead of relying on a more collective approach. The system is designed only to react and has no mechanism for being proactive—other than any one person's agency, of course. The system also encourages short-term thinking rather than a more balanced short- and long-term perspective which comes to the detriment to proactivity. This system has no method of exploration to apply one's curiosity and thinking, either. Figure 7 details the system behaviors mentioned above. Two behaviors not included in the rest of this analysis as they don't relate to the subject matter at hand.

¹⁴ Senge, P. (1997) *The fifth discipline*. (MCB UP Ltd)

¹⁵ Meadows, Donella, H. (2008) *Thinking in systems: A primer*. (chelsea green publishing)

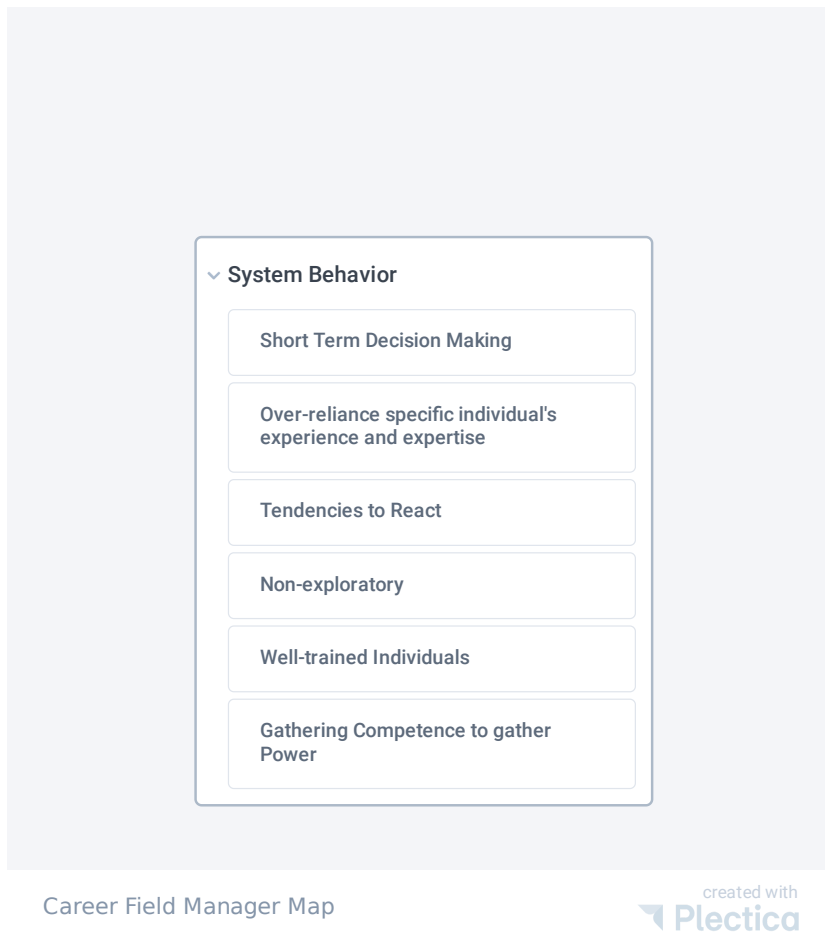


Figure 7: System Behavior

POSIWID Analysis

The term POSIWID, or the purpose of a system is what it does, was coined by Stafford Beer, theorist and consultant in the fields of operational research and management cybernetics. In his 2002 article, he claims, "According to the cybernetician, the purpose of a system is what it does. This is a basic dictum. It stands for a bald fact, which makes a better starting point in seeking understanding than the familiar attributions of good intentions, prejudices about expectations, moral judgments, or sheer ignorance of circumstances."¹⁶ In other words, rather than try to assume intent or analyze from what moral standpoint the designer of a system might have been, a better starting point is to analyze the system and use its impacts as the purpose.

¹⁶ Beer, S. (2002) *Kybernetes*

The ABA approach makes this explicit by having one state what the system does from the perspective of something done well, even if it is negative. Thus, we have the description in the table below about how the Air Force improves careers.

Identify System	Result of the Failure	Describe as POSIWID
Career Field Improvement Model	Short-Term Thinking, Reactivity, Overreliance on experience, no exploration	The way the Air Force improves career fields is exceptionally well designed and effective at its purpose of creating short term thinking, relying on reactivity, over-dependence on experience, and disincentivizing exploration.

Table 1: POSIWID Analysis part 1

The POSIWID analysis then moves into an idealized state. If the Air Force is so good at improving career fields in a way that maximizes short-term thinking, is reactive, and is over-dependent on experience, then what does the ideal, or at least better, approach look like? This can be seen in the table below.

Identify System	Result of the Success	Describe as POSIWID
Career Field Improvement Model	quickly spot trends, Balance long-term and short-term thinking, developing explorers, continual understanding of the horizon	The way the Air Force improves career fields is exceptionally well designed and effective at its purpose of quickly spotting trends, balancing long- and short-term thinking, developing possibility explorers, and expressing a continual understanding of the changes on the horizon.

Table 2: POSIWID Analysis part 2

We can then place the current and ideal POSIWID statements side by side and analyze the differences between the two:

Current System POSIWID	Future System POSIWID	Root Difference
The way the Air Force improves career fields is exceptionally well designed and effective at its purpose of creating short-term thinking, relying on reactivity, over-dependence on experience, and disincentivizing exploration.	The way the Air Force improves career fields is exceptionally well designed and effective at its purpose of quickly spotting trends, balancing long- and short-term thinking, developing possibility explorers, and expressing a continual understanding of the changes on the horizon.	• Futures Focus vs Present focus • Diverse perspectives vs singular expertise perspective • Possibilities vs Certainties

POSIWID analysis part 3

CAS Analysis

A CAS was identified above as a system of adaptive agents which follow simple rules, and it is the following of those rules that lead to complex behavior. For example, birds flocking follow simple rules but become a super-organism in the process. The goal of CAS analysis is to identify the independent agents within the system and to understand what rules they are following. The nature of this project leaves a primary agent, which leaves the needing to understand the rules and reasoning behind them.

	System
Who/What are the agents?	CFMs
What is the agent's perspective?	Don't fall behind
What are the simple rules?	React, recover, excel
What is the system-level behavior?	Continued discounting for emerging trends Adaptive to hyper-local context in time Extremely well-trained Airmen for the present
How do the items above lead to the system-level behavior?	Interactions in the environment cause more/less reactivity in the present at expense of the future

The simple rules that CFMs are following within this system are react, recover, and excel. It's important to note that even while the system is non-optimal, parts of it are producing excellence. The simple rules of reacting and recovering are what produce the behavior of sacrificing the present at the expense of the future which leads to short-term decision making and overreliance on a specific individual's expertise.

Strategic Recommendations

Suggesting specific policy changes would run counter to the entire analysis that has been carried out this far. To truly take the mindset of the framework to heart, we should not intervene at the systems level but at the simple rules the agents (CFMs) follow.

A Rubric for Recommendations

It is not enough to have recommendations but to ensure that the recommendations are based on specific criteria carried out by analysis.

Within the framework of ABA, this is called a rec-rubric or recommendation rubric. It takes the root difference carried out in the POSIWID analysis and has the analyst make specific rules that do not violate that root difference. The rubric for the recommendations are that they must:

- 1 Place greater emphasis on the horizon than on the present.
- 2 Include diverse perspectives, using the collective voice of the career field
- 3 Be geared toward exploring possibilities of the future rather than betting on certainties.

Recommendations

Two recommendations come out of this analysis. They are specifically geared toward giving CFM teams a greater ability to develop a futures-resilient force. The first recommendation is to develop a horizon scanning capacity. While scenarios would be an added benefit, the act of horizon scanning would provide CFMs enough to pull from more diverse future outcomes than their expertise alone would suggest. The specific methodology employed does not have to be the one mentioned in the case study, but it is my belief that the method gives the horizon scanner a wider perspective which is of particular necessity in managing career fields.

The second recommendation is to mix the existing practice of having highly selective working groups to make career field decisions, with input from voices across the field. The purpose of this recommendation is not to be stringent on exactly how to carry this out but to say no matter how CFM teams decide to do this, they must make sure they are getting robust qualitative and quantitative data with minimum amount of interpretation from the CFM teams. While either of these recommendations could be executed in isolation, combining recommendations one and two result in the most detailed data.

Conclusion

IN OUR MODERN AIR FORCE LANDSCAPE in which we are told that change is a priority, that our potential adversaries are capable of out-innovating us if given a single moment's slack, how we manage our career fields will be a major pillar in how the USAF shows up in that landscape. If CFM teams cannot adapt to the emerging landscape, we will be left with under-trained personnel struggling in battlefields beyond their training. Using the suggestions above, CFMs can

make sure that all operators are trained beyond the capacity of the landscape they operate in. This can be our competitive advantage.

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