**Strategy and Structure within Paradox: A Model to Translate Strategic Planning**

**Introduction**

A “flexible, adaptive, and agile force structure” sounds like a great idea. The problem is that historical structure promotes certain behaviors while inhibiting others. O. Henry wrote a story entitled Pendulum near the turn of the twentieth century; it tells of a man named John married for two years living in a flat who, “in the lexicon of his daily life there was no such word as 'perhaps'.”¹ He comes home expecting his normal routine and finds his wife gone because her mother had fallen ill. Realizing that he had not paid enough attention to his wife, he vowed to change his evening routine to better care for her. Just then, she walked in the door, having gotten a telegram that her mother was not as sick as originally thought. John immediately reaches for his hat to go shoot some pool with the fellows, returning quickly to the routine he had just sworn to adjust.

Raised in an environment very different from the one in which we find ourselves, naval engineers have a similar tendency. Each of us has a preferable routine, but we have found that routine challenged. Ms. Hinton states, “the Society is in the middle of rough financial times ... the business model is not working well in the current environment.”² What we find in our personal lives, we find in our environment, and we find in our profession.

The change necessary to transition a force requires a change to the structure, but it also requires a change to the strategies that underlie those structures. Within the Coast Guard, “two sets of ideas are competing for the future.”³ Paradox helps explain this competition; both ideas are sound, but exist within a force field that typically requires not an “all-or-nothing” decision, but a weighting between elements in tension with one another. Four paradoxes exist within the Coast Guard. Each requires discussion, balance, and resolution to best align strategy with structure. The four paradoxes are the paradox of age, time, assets, and specialization.

The Paradox of Age

The paradox of age must maintain historical knowledge during technology insertion to appropriately promote human systems integration focused on the operators using efficient human engineering. How savvy are the operators with the new technology and how old is the technology by the time it arrives aboard our ships? This is an incredibly important question considering that “technical obsolescence is a key driver of service life for surface combatants due to their highly integrated warfare systems. This makes surface combatant modernization a priority.”4 If the players don't know how to use the systems, it won't work. Even as we train old operators on new technology to prepare for a future threat mix, what results is an increasing reliance on technology and technical support costs within operations. Of course, if the technology grows old, naval combatants may not be able to counter modern threats. Moreland, Wallace, White, and Davidson state, “There is nothing more complex, more demanding of engineering mastery, more dominating the world over, and yet more sensitive to catastrophic system failure than the naval warship as sea defending our nation.”5 6 Their solution to getting the design requirements right is given by quoting NAVSEA's Systems Engineering and HSI Director, Trish Hamburger, “The real key for us is that human systems integration, in all its dimensions, is a key part of systems engineering; and it has to be embedded at the very beginning, during the analysis of alternatives, the initial concepts, and the initial requirements, and then measured throughout the process in order to ensure that our systems are designed to optimize warfighter performance but, more importantly, to optimize total system performance to actually meet the mission capability.”7 While this sounds good in theory, the question remains as to how to balance the time required to design, build, accept, operate, support, and ultimately recapitalize assets within an organization that is probably best described as one big succession plan. With constantly young and technologically-savvy service members and an endless training regimen, how

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7 Ibid, 57-58.
young is too young for an operator, and how old is too old for the technology aboard our ships? With some of the oldest ships in US commission within the Coast Guard, this is an important paradox within our service because of the escalation in support and maintenance costs based on fleet age.

The Paradox of Time

The paradox of time is about balancing workforce development, training, and education with operational requirements to maximize readiness. An old fleet creates requires quite a bit of competence for our shipboard engineers. But this isn't simply a naval engineering problem, but a systems engineering problem as well. The Story of AEGIS helps direct this discussion.

“The goals of AEGIS could never be realized solely with a weapon system, combat system, or ship design. A supporting infrastructure was critical to maintaining AEGIS readiness. That infrastructure had to include crew training, engineering, computer program maintenance, configuration control, and logistics to name but a few. The ultimate answers to these questions led to the following dedicated support sites: AEGIS Combat Systems Center, AEGIS Computer Center, AEGIS Training and Readiness Center, and Naval Ship Weapon Systems Engineering Station.”8

As time wears on, people forget. Nasr states, “The kind of skills and talents that are absolutely necessary to foster sustainable practices and systems may not be easily compartmentalized any longer. Closer linkages between the various disciplines, functions and system-based approaches are critical to making progress and to advance the science of sustainability.”9 The question for AEGIS is a question for us all, how do we sustain success over time. As the future draws near, Kimmel states, “the unique management structure that made AEGIS a success may be needed yet again.”10 We must consider time not just as the means by which we learn or forget, but as the tension between creating readiness and consuming it. The reason AEGIS required such an integrated approach was because each of those entities served to create the readiness desired. The results of the

program so often provided as an example were simply the successful expenditure of that
readiness. So our paradox is has the requisite workforce development, training, and
education on the one hand and operations on the other. With all military workforces
grown from within, we must appropriately balance the time we spend preparing those
people for our missions with the amount of time we spend using those people in our
missions.

The Paradox of Assets

The paradox of assets requires interoperable platforms capable of survivability and
adaptability. Even as we've discussed our personnel requirements, we must consider the
assets that will support us against the paradox of time. How do we balance assets for
training and assets for operations; which is more important? Returning to our AEGIS
example, RADM Wayne Meyer, commonly referred to as the “Father of AEGIS,” speaks
of excellence instilled from his commanding officers as ‘‘backup on backup on backup'.
The very nature of war and the unforgiving nature of the sea demand that both plans and
systems have numerous fallback options.’’11 Interoperable platforms requires not just
current systems to work together but future systems as well since no fleet remains
stagnant. Promoting open architecture, Lundquist quotes RADM Benedict,

“To truly get the Open Architecture Philosophy, the first thing that you need to do
is break the software from the hardware so that you can put both of them on a
cycle for refresh that really allows you to take advantage of the technology
improvements that happen naturally in industry, but also allows you to really take
full advantage of new innovation within industry.’’12

As we consider the beauty of plug and play systems that are adaptable in their ability to
meet our mission needs, we must consider how much change can be generated within the
system architecture and how sure are we that it will meet both our current system needs
and our future requirements. On the opposite side, survivability requires redundant
systems, which are high cost both in initial installation and replacement. Redundant

12 Edward H. Lundquist, “USS Bunker Hill Emerging from Transformation as a 'Sharper Sword':
Crusier Modernization Extends Combatant Service Life, Enhances Capabilities,” (Naval Engineers Journal,
Vol 120, No 3, 2008), 17.
systems inherently slows the opportunity for systems adaption without increasing the number of systems. We can add better technology while keeping the old as a backup, which then impacts the paradoxes of time, age, and specialization for operators that now need to understand both.

The Paradox of Specialization

The paradox of specialization focuses on balancing human capital with artificial intelligence according to the missions and threats of a particular platform with often varying requirements. One solution to fixing our training gaps is to build our systems to not need as many people. In fact, “the Navy is already challenged with the task of breaking away from traditional maintenance programs and tailoring a new approach that takes into account the reduced crew sized and structural configurations requiring more frequent and comprehensive inspection techniques.”\(^{13}\) At a time when specialization is increasing, we are becoming more reliant on fewer and fewer people who truly understand the systems we use. However, better trained people doesn't always require fewer people. Smart information technology generally requires not fewer specialists, but a different kind of specialist. Ultimately, something has to make up for reducing people. What seems to have been occurring within the Coast Guard is an increased reliance of our machinery technicians as parts-changers aboard our ships while the true understanding of our systems exists within either our depot-level support personnel or contractors when we return to port. “Computers play such a large role in any modern control system today that the recognition and understanding of the architectural framework that house the functional capabilities within the system has taken on increased importance.”\(^{14}\) And it's not just the systems, but also the cost-prohibitive tools necessary to interact with those systems that limits the number of specialists even available. Even the academic field of systems engineering is finding itself outpaced by the combined need for generalists who can respond to varying missions, threats, and requirements within an environment tending toward increased specialization given the technology of

\(^{13}\) Glenn M. Ashe, “Maintaining Naval Combatants in ABS Classification In-Service,” (Naval Engineers Journal, Vol 120, No 2, 2008), 36.

the systems we use. The National Center for System of Systems Engineering at Old
Dominion University has characterized the field of system of systems by the following
conditions: holistic problem space, ambiguous, uncertain, highly contextual, emergent,
non-ergodic (no defined states or discernible transitions between states), and non-
monotonic (increases in knowledge are not reciprocated by increases in understanding).15
Even as we define the environment and the problem, we must remain conscious of the
tension between generalists who are best prepared to respond to varying missions, threats,
and requirements and specialists who are best prepared for fixed missions with fixed
requirements.

Recommendations

Having provided a high level exploration of these four paradoxes, let's now consider what
method we might use to help to dissolve them. Moreland states, “An effective
implementation strategy needs to be developed for the application and integration of the
instruments of national power, which will have a direct impact on the size and shape of
the future force design. The ad hoc responses of today are very inefficient and sometimes
counter-productive due to the method of apply a little of this and a little of that and hope
for a positive result.”16 While I cannot promise comprehensive, integrative strategy that
results in clear future force requirements, we must consider what is essentially as system
of systems engineering problem by cutting through the uncertainty toward practical
solution within the context in which we reside. In support of this effort, I have developed
a model to simplify the process that we use to align strategy and structure within our
organizations. I have used it frequently in strategic planning sessions. It serves very well
to focus discussions to the most pertinent issues to help break down complex problems
into manageable chunks. While I cannot provide a solution to the paradoxes I present, I
can provide an innovative process to help others work through some of theirs. While the
model I present is simple in its design and easy to understand, it is essentially a

16 James D. Moreland, Jr., “Structuring a Flexible, Affordable Naval Force to Meet Strategic
Demand in the 21st Century” (Naval Engineers Journal, Vol 121, No 1, 2009), 49.
translation to reveal the strategic implications between the various views presented. The model is provided below:

**Strategic Planning Translation**

If you spend the time understanding the reason you're in business, the purposes you are purporting to meet, and the originating documents for your existence, then you will be tossing the wheat into the air and watching the chaff drift off with the breeze and the grains fall to the ground. You will still be left with a complex problem, but less excess. Do that enough times (perhaps using the 5 Why's so common in industrial engineering literature) and even with an uncertain future, you will have gotten to the need.

Once the why and the what are clear, you can move on to the operating environment and perform an environmental scan using methods like a SWOT analysis to determine how to meet your overarching goals, which can be further broken down to objectives and action plans. We need to get away from Rudyard Kipling's poem and ask the basic questions in the right order. The paradoxes will never go away, but we can attempt to find our place within them using this basic technique. Assumptions will always
exist based on our previous experiences, but if we genuinely want to change, then we must break from our routine and be more strategic in our efforts.

References


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