A MARKET VIEW APPROACH TO OPTOMIZING THE GROUND IN ENTERPRISE GROUND SERVICES

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ABSTRACT

Most military acquisition officials in uniform do not understand commercial space services. Therefore, they do not know how to effectively buy these services. At Air Force Space Command (AFSPC), an initiative known as Enterprise Ground Services (EGS) is meant to boldly address this deficiency with the intent to improve warfighter ability, focus operators on mission effects, expose data to enable exploitation, and transition to flexible ground operations.

Military space programs exist to enable warfighter activities. The challenge is multi-fold that: warfighter activities happen in real time and the space programs are days long planner focused, the systems were built assuming space was a peaceful domain, and systems were delivered individually.

Commercial ground network providers have a unique opportunity to set the stage in the Enterprise Ground Services initiative and advance AFSPC towards a more desired end state where the space segments are harmonized on the ground by providing flexible, adaptable, and taskable resources on an as-needed basis.

This paper will focus on a market-based approach to allow government acquisition officials a commercial view of the intersection where buyer and seller come together. The paper is meant to show an entrepreneurial view of what commercial service acquisition looks like, as opposed to today's "culture of requirements".

A MARKET VIEW APPROACH TO OPTOMIZING THE GROUND IN ENTERPRISE GROUND SERVICES

Satellite Operations (SATOPS) Transformation has been on the horizon at Air Force Space Command (AFSPC) for quite some time. The Air Force Satellite Control Network's (AFSCN) Remote Block Change (RBC) and Global Positioning System's (GPS) OCX programs are the latest lessons that government's best intentions don't equal results. Why is this the case? Without getting into the details of either of those two programs cause for underperformance, it appears that Enterprise Ground Services (EGS) has a chance to show some promise as real SATOPS Transformation, primarily because it is part of a culture shift that is accelerating within

AFSPC. This culture shift, embodied in EGS, is leadership driven, and brings a new shift in a desire to leverage, mimic, and employ a more commercial services mindset.

WHAT IS ENTERPRISE GROUND SERVICES?

Enterprise Ground Services is an initiative still somewhat being defined by AFSPC. Basically, EGS is meant to be a "service environment" to enable several objectives. These objectives are rightly to: re-task Air Force Space Operators off of routine tasks and on to military inherent tasks, optimize resources, and enable resilience options, all in the overarching goal of improving warfighter effects.

These objectives will be accomplished by EGS in several ways: the first is a common ground system known as the Multi-Mission Space Operations Center (MMSOC). This system is receiving a lot of the press, but at the same time, causing confusion in industry related to EGS. The cause for this confusion is because MMSOC is being equated as EGS. This is the traditional (and possibly hopeful by some) thinking where a system is designed, built, bought, and delivered. However, MMSOC by itself is only one component of EGS. Because the government will own the EGS standards and interfaces, there doesn't appear to be much incentive for commercial entities to build a better hardware-specific MMSOC at this point. It is the other components of EGS where there is excitement and incentive for commercial entities to focus their efforts. These components are in the commercial services part of EGS necessary to achieve the full SATOPS Transformation. One commercial service is possibly outsourcing satellite TT&C. This clearly frees up manpower to focus on other warfighter tasks. Another commercial service is to buy only the necessary antenna time from multi-band, all-altitude commercial network provider instead of owning, operating, and maintaining a dated single-band network. This frees up manpower as well. Basically, AFSPC is breaking out from traditional acquisition models and creating a new market for SATOPS Services!

EGS will allow for commercial services providers to "search the EGS Wiki-page, develop the app, post it on the EGS 'store', and then continue to improve the application with downloadable updates to stay relevant and desired as a supplier". The expected features of EGS will be complex and adaptive, but not outside the realm of commercial services providers since they are already proven, both to government and commercial customers.

Bottom line: EGS is the instantiation of a sustainable national critical infrastructure and key resource where commercial services play a critical role.

WHAT ARE COMMERCIAL SPACE SERVICES?

Successful entrepreneurs start to build a business by clearly answering the question, "what 'pain' am I trying to solve?" As an illustrative example, Steve Jobs of Apple solved 'the pain' of putting many single use devices into one location, and created the smartphone. Success.

I'd like to offer a definition difference between Industry and Commercial Service at this point. Industry to me basically means the building of *products* in return for a profit. In the case of national security space, the primes like NGC, Raytheon, Lockheed Martin are referred to as industry because the DoD puts them on contract to build *things*: tanks, sensors, satellites, destroyers, bombers, ICBMs, etc. Commercial services, on the other hand, are businesses meant to *serve its customers with an application*, either of people or hardware, in return for a profit. It is possible for a company to have two arms: a commercial arm and an industry arm. For example, Boeing and Lockheed Martin both have this arrangement and makes for a viable business.

In commercial markets, businesses understand the concept that "value is subjective". This concept means the customer decides where and how to spend money to achieve the value they seek. Said another way: a $10 bill has no value until you trade it for a seat in a movie theater or buy a slice of pizza and a beer after the movie. What this concept does for EGS is to provide many options across multiple disciplines that may previously been unknown or unavailable when a requirements documents was authored. For example, if I have the next "killer app" idea that came to me the day after my competitor won the old-school style government contract, both EGS and I lose. But in an environment where multiple providers are competing for business continuously, my "killer app" idea will still see the light of day and stand on its own merit. Ultimately, it's only if the application is downloaded, will I truly know I created value in the eyes of the customer. This idea, stated more eloquently by Austrian economist F.A. Hayek, goes like this, "Insofar as an economy is market oriented, the ultimate determinate of "where money goes" – that is, of where resources, including labor, go; where the course of productive activity goes; where financing goes – is the detail in the pattern of consumer spending (including consumers' decisions on how much, how long, and in which specific forms). Consumers' decisions ultimately determine where capital and labor "go" and what their values are in alternative uses.

In 1776, Adam Smith described an idealized economic process where individual economic activities not only benefit the self-interests of the individual, but also unwittingly benefit the holistic interests of society. Smith suggests that an economic actor who produces goods of the greatest value "intends only his own gain, and he is in this, as in many other cases, led by an invisible hand to promote an end which was no part of his intention. Nor is it the worse for the society that it was no part of it." This description of the "Invisible Hand" has stood the test of time and shows how the free-market's economic order is an emergent, dynamic, bottom-up, and

self-organizing process that no one controls. Essentially, order emerges within a complex adaptive economic system even though it is decentralized and leaderless. This is not exactly the same as the JCIDS process of today.

WHERE DO COMMERCIAL SPACE SERVICES AND EGS INTERSECT?

In a free market there are buyers and sellers. This is also true in today's DoD 5000 acquisition driven system. In this specific case of EGS, the buyer is AFSPC and the sellers are multiple commercial providers all engaging with the buyer continuously based on their state of the market offerings. This is drastically different than a single "winner take all" competition.

At the intersection there are several unique offerings for consideration by AFSPC even at this early stage of the initiative. One is the availability of considerable amounts of privately held infrastructure. Examples include SSC's Universal Space Network, transponders for lease on varied GEO birds, taskable commercial imaging satellites, etc. It seems reasonable to a free-market thinker that this infrastructure can be bought as a service when mutually agreeable terms are satisfied. It appears AFSPC is beginning to acknowledge and understand the economic principles that privately held infrastructure can be leveraged as part of EGS execution.

One area where commercial service providers and the DoD intersect today is in the Information Assurance arena. When the DoD recognized that the process for updating the DIACAP standard was inadequate for the aggressive threat cycle, a new model was necessary. Instead of developing a new and DoD-unique policy or standard, they embraced the National Institute of Standards and Testing (NIST) for network security. The current NIST emphasizes both risk and risk management but the cornerstone of NIST is its risk management framework. Since networks are interconnected and a failure somewhere could "spill" to others, network security becomes everyone's responsibility. Leveraging the best of commercial, government, and academia minds will result in more secure government networks than operating by themselves in a requirement driven model. Similarly, a risk management framework for EGS will result in a safer and agile enterprise.

For AFSPC leadership consideration, risk is a function of consequence, vulnerability, and threat. Mathematically, $R = f(C, V, T)$. The Department of Homeland Security (DHS) defines risk management as the "process of identifying, analyzing, assessing, and communicating risk and accepting, avoiding, transferring or controlling it to an acceptable level considering associated costs and benefits of any actions taken." This definition seems transferrable to AFSPC for EGS.

WHY IS A FREE-MARKET AN ADVANTAGE FOR EGS?

Unfortunately, after decades of operating in the Military Industrial Complex there is only an anemic amount of free-market thinking within the Department of Defense acquisition process. This is understandable, since humans, especially contracting officers and program managers, are rational beings. The result however is often times sub-optimal. A few reasons for consideration are:

Intentions are not results: When a Program Manager authors the requirements for their system they are quite "stuck" actually. They need to find a balance between what is "possible" today and what they think is possible upon the system being delivered. In a traditional "big space" acquisition, the deliver is often more than a decade in the future. In commercial terms, this is equitable to approximately three system "refreshes".

Similarly, our world is unavoidably one of trade-offs and not "solutions": Most Programs Managers do understand this concept but the problem is that once a requirement (i.e. "solution") is written and bid on, or even won, by a single supplier, it becomes a "commandment". In a typical space system acquisition, there are, quite literally, tens of thousands of "commandments". And if broken, going to confession doesn't necessarily absolve you of the wrongdoing. Delivering 'capabilities' vice 'requirements' is more the commercial way and is less restrictive on the service provider.

Commercial market-determined prices are not arbitrary: Sometimes I think when I talk to acquisition folks and Program Managers, they think I'm just out to gouge them for as much as possible. But in reality the "invisible hand" works its magic to ensure that if the supplier's price doesn't align with the buyer's value need, it's likely a contract may not be in my future.

Productive and sustainable complex economic order thrives without design or intention by government: It may be hard to believe, but the free market really does respond quickly and efficiently to the supply and demand curves in varied markets. For proof of this tenant, look only as far as the oil market the past 2 years. While building SBIRS-Next may not be anything close to a commodity, there are aspects of that system that may benefit from near commodity services, such as buying passes on a commercial ground network. In the end, markets and individuals respond to incentives whether they are government officials or commercial service providers.

The role of government should be to build infrastructure where there is no incentive or method for commercial suppliers to operate. Government should not exist to compete with commercial providers. The important point here is that producers and consumers are both coordinating their diverse and self-interested activities through an economic transaction (i.e. purchases).

A free market economy, which allows commercial service providers to exist, has two key advantages. First, it encourages individuals to innovate. Individuals have the freedom to create new ideas, new products, and new services to sell for profit. They are not required to only produce what the government tells them to produce. Due to this freedom, competition is created, forcing companies to create new products and features. A clear example of this is the cell phone market. New phones come out each year, as individuals create new ideas and new features for their consumers.

The second major advantage is that buyers and sellers drive the most efficient solutions. If a customers wants a certain product or feature, the producer must meet their needs in order to survive. This ultimately drives the price, as customers determine the price of products, when they see a valued opportunity.

However, disadvantages are created in a free market as well. Profit motive drives businesses, but can create dangers. Poor working conditions and unethical decisions can be made as entrepreneurs seek even higher profits. Secondly, free markets can lead to market crashes as we saw in the great depression and the economic downturn in the early 2000's. Unemployment can lead to social as well as economic problems. While negative externalities are also created, any economist will support the idea that when the summation of all positive externalities > the summation of all negative externalities, the system sees an increased benefit.

HOW TO BUY COMMERCIAL SERVICES for EGS?

The entrepreneurial approach to EGS risk management is, in a sense, Darwinian. The most sustainable, cost effective, and dynamic EGS risk management solutions have the potential to emerge through variation, selection, and replication.

Because EGS is not its own “program of record”, the approach will likely be financially uncertain from year to year. The funds to sustain EGS will come from the programs themselves, similar in the economic concept of a tax used to fund infrastructure like roads and bridges. Given this assumption, what policy options are currently available for a risk management model that is operationally functional in austere environments? The risk management model for contracting and budgetary resources in the form of Service Level Agreements (SLAs) would be

the commercial equivalent. An entrepreneurial free market system is most comfortable in answering this customer's call. In order to successfully and sustainably coordinate the EGS risk management posture, both partnerships and information sharing are not only required, but paramount for success.

Infrastructure, as stated earlier, is the physical representation of an economic actor's business decision. That being said, what might be the impetus behind an economic actor's business decision? Nobel Laureate Milton Friedman asserts that the primary, indeed only, purpose of business is to seek profit. First and foremost, commercial infrastructure exists because the entrepreneurial actors chose to take the risk to build (i.e., produce) infrastructure to maximize their profits. Alternatively, separate economic actors choose to use (i.e. consume) infrastructure to maximize their own profits. In the case of AFSPC where profits are not the concern, but rather maximizing capability per dollar spent is the concern, the model still holds true. The common denominator for both types of economic actors is choice and profit (or the minimizing of dollars spent). When EGS can dynamically plug into existing commercial ground networks, in the spirit of infrastructure as a service, like SSC's Universal Space Network, efficiencies are immediately possible, since there is no unused/extra capacity cost.

In national security space jargon, competitive prices could be considered unclassified "actionable intelligence." As they relate to consequence, vulnerability, and threat, price fluctuations would influence an economic actor's business decision. Price is defined here as "that which you have to give up in order to receive something". Price is different than cost. Cost is defined as "that which the company gave up in order to make it".

The DoD has an excellent vehicle for buying commodities in the U.S. Government Services Administration (GSA). Some services already exist on GSA such as transponder leasing, commercial ground networks by the pass, and Fixed Satellite Services (FSS) and are priced publicly, offering the purest form of transparency possible.

SUMMARY

We live in the "Age of Surprise". This age of surprise is possible because of technologies, interconnectedness, Black Swans, and private capital ready for investment when risk is assumed. Where there is daily competition there will be improvement.

Like most challenges, EGS is fundamentally an economic problem, and the free market system is the most efficient way to find solutions to problems of today and tomorrow.

Commercial services are not appropriate for all military missions. The crown jewel sensors on orbit, nuclear submarines, and stealth weapon systems are best left to industry and government teams to invest in and operationalize. However, if you are just reaffirming the government-owned status quo, EGS will never get off the ground because the culture change spark couldn't find enough risk takers to start the fire.