Identifying Solutions to Complex Problems – How Bright Spots May Change the Army

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"Despite the effort to capture "lessons learned" in the Army's AAR process, commonly Units tend to repeat their own failures, if not the failures of other units, time and again. Rather than focusing on what is broken or damaged the Army requires behavioral and social change. Such change must identify and reward creative thought and ingenuity so as to simulate constructive and collaborative effort, leading to Unit mission success, and furthermore the success across our greater force."

Solutions Require a Shift in Focus – Defining Success

The Army's method to identify and correct deficiencies, sustain strength, and focus on performance success is the after-action review (AAR). This process is intended to be a collaborative discussion which is to follow both formal and informal training events. The AAR focuses on the given, or specified performance standards, to allow participants to identify the intended results, whether success was achieved, the cause for success or failure and how the organization can sustain strengths and improve upon weaknesses (U.S. Army TC 25-20, 1993). The Army commonly conducts these AARs, though they often fail to identify successful practices. Our Combat Training Centers (CTC) are often locations where large scale AARs take place, and are often captured for the purpose of future benefit and implementation across the Army. Despite this effort to capture "lessons learned", organizations tend to repeat their own failures, if not the failures of previous units, time and again.

The Army requires a system of review that fosters a climate that rewards creative thought and problem solving. This, as opposed to focusing efforts on what failed, is much of what occurs within the AAR process. It is a natural reaction for people to focus on the negative, and in the same perspective the AAR system follows suit. The current logic is to rely on a resolve that justifies a need to locate and reproduce success. These acts of success are termed "bright spots" by Jerry Sternin (Pascale, Sternin, & Sternin, 2010). The question which remains, can the Army restructure or replace the AAR process, so as to simulate constructive and collaborative effort, leading to unit mission success, and furthermore building success across our greater force.

I propose that our Army may find greater success focusing on identifying such "bright spots" which, conceived by subject matter experts (SME), afford success upon the employment of these solutions. On several fronts across our formations, Soldiers have conceived solutions to complex problems which have proven successful. Rarely does the Army acknowledge these "bright spots", nor does the Army award the effort, which leads to greater ideals and success.

Jerry Sternin sought out "bright spots" in his attempts to solve complex social issues in an environment that was ripe with significant challenges. This concept is not based upon a process, but rather an approach to behavioral and social change. The Army must adopt such changes in their approach to success. It begins with leaders. Operationally successful military units often are led by commanders that realize the bureaucratic top-down approach must be supported by creative thinkers from within their ranks. These commanders often find value in the initiative subordinates take to solve both simple and complex problems in the face of adversity. It is rarely addressed that a leader is responsible for identifying what is broken within their organization and the solutions to that failure. It is a leader's responsibility to cultivate a relationship with his/her subordinates which encourages creativity and problem solving. Only leaders can foster a climate that rewards creative thought and problem solving. Programs do exist to recognize Soldier's accomplishments. That said, of the examples below, few would be aware of these accomplishments outside of the unit or regional organization. This must

also change. Successful solutions must be presented to the greater community. Solutions must find their way into publications to wide dissemination. This accomplishes two key objectives. The first is the sharing of success throughout the organization. The second is the recognition on a wide scale. An impact award is rather meaningless when compared to the credit received from an Army publication seen by all. I argue that Soldiers require recognition. The Army has existing publications that would enable this credit to be paid. Additionally, all credit for the intellectual property must remain with the creator. Junior Leaders would likely commit resources to solving such complex problems if they received recognition for their support and the identification of solutions. Senior leaders would be responsible for ensuring that successes are properly acknowledged, along with the leaders which were responsible for supporting the effort which led to the success.

Bright spots have been present in our formations and continue to exist. I wish to offer a few examples in which Soldiers, through creative thought, have solved complex problems. I do so by acknowledging a few “bright spots”, which when thoroughly examined, have led to solutions that positively impacted the overall mission success. I hope that these stories may provide junior leaders with examples so as to aid in their identification of such solutions within their formations.

A Proven Battalion DCGS-A Solution – System Configurations Which Maximize Capabilities

A recent topic of discussion has been the implementation of the Distributed Common Ground System-Army (DCGS-A) at the Battalion-level. DCGS-A is the Army’s premier intelligence enterprise, program of record (POR), and primary weapons system for the Army’s military intelligence professionals (ASC Army Acquisitions Support Center, 2016). The senior-most Army leaders are looking for solutions to provide our Battalions with timely, relevant and accurate, targetable intelligence data and digital analytic tools requiring minimal resources, in a ruggedized, lightweight configuration. I wish to offer that a solution exists within the existing capabilities of our POR and requires only modifications to software configurations.

While I served at 3rd BCT, 25th ID, I was afforded the opportunity to be part of a successful DCGS-A Battalion solution. In preparation for a brigade validation exercise (VALEX), my unit was faced with the challenge of supporting subordinate battalions with accurate, timely and reliable intelligence data over a severely restricted network and with minimal use of hardware. Though the network limitations were based upon known capability shortfalls, the hardware limits were intentional so as to maximize the unit’s flexibility and mobility. In addition to the desired flexibility and mobility, battalion personnel often lack the knowledge and experience of operating the servers associated with DCGS-A. This fact accounts for the reasons why battalions throughout the Army rarely utilize DCGS-A. My unit was determined to find a solution that would work around the limitations that existed.

The standard method in which DCGS-A shares data between servers and client workstations is resource intensive, commonly requiring robust bandwidth within the network to communicate between the battalion and brigade. The solution to this problem was found within the 25th ID ACE. The Division's Intelligence Systems Maintenance and Integration Technician offered what would qualify as a "bright spot", though routinely exercised within their unit. The solution provided utilized a preexisting server/client configuration designed within the system software. This in conjunction with a few modifications, minimized the battalion DCGS-A footprint, requiring only a server at the brigade headquarters. It utilized far less bandwidth over their tactical network, and all without diminishing the productivity or functionality. The battalions received all the benefits which DCGS-A could provide them, and without the common cost of critical resources.

The concept of utilizing workstations as "server laptop", and other workstations as clients of the "server laptop" has existed for quite some time. Though this configuration was engineered into the system software, 25th ID had tested this configuration extensively and improved upon it. The "server laptop" was configured to replicate data with the brigade DCGS-A server. The client workstations were configured to replicate data with the "server laptop". When the battalions experienced a loss in network communications, their information, having been added to their local server laptop database, remained. Once network connectivity was restored, updates were pushed both to and from the brigade DCGS-A server and battalion "server laptops". This configuration was duplicated across six battalions, all utilizing one workstation as a "server laptop" and several workstations as clients of their "server laptops". In total, 3rd BCT, 25th ID incorporated 47x DCGS-A workstations for this VALEX across the brigade's footprint, all running off of 1x DCGS-A server, located at the brigade.

This solution offered maneuver battalions access to timely, relevant and accurate, targetable intelligence data from their higher headquarters. The battalion retained that data throughout any loss of network communications, and shared updates and refinements upon reestablishment of network communications. Lacking the use of an actual DCGS-A server at the battalion, this solution was lightweight and mobile, though did lack a ruggedized package. This solution further accounted for significant bandwidth limitations which is commonly experienced when operating tactical networks at the battalion echelon.

Additional modifications to the configuration proved to increase the efficiency of the DCGS-A server for the brigade. The modifications to the DCGS-A server configuration dedicated a single virtual server to conduct the process of message extraction, a process that typically requires increased processing resources. The need for such additional processing resources have commonly limited the capabilities of DCGS-A servers. Additionally, virtual servers were dedicated to "Production" and "Targeting", where data was replicated between them.

These modifications and configurations to the to DCGS-A workstations and server led to the successful employment of DCGS-A at the battalion level for both my

brigade's VALEX in February 2015 and the subsequent certification exercise (CERTEX) at the Joint Readiness Training center (JRTC) in April 2015. This exemplifies what can be accomplished when leaders foster an environment of creative thought to achieve mission success. This success was briefed during the AAR following both the VALEX and CERTEX. The findings were captured and published so that future units might benefit from the success. Unfortunately, this success, or the efforts which facilitated this success were not adequately captured for dissemination across the U.S. Army.

Employing Alternate Data Transfer Methods – Ensuring Timeliness of Intelligence Reporting

Members of 25th ID identified that their Human Intelligence (HUMINT) Collectors were severely hindered by a lack of communications capabilities which reduced the timeliness of intelligence reporting. The Army HUMINT enterprise has relied heavily on pre-established upper Tactical Internet (TI) communication infrastructure to disseminate collected intelligence information (CW2 Hunter, CW2 Jackson, 1LT Mohr, & CPT Miller, 2017). In an effort to determine a method to transfer data from collectors to the intelligence fusion cell, a greater understanding of beyond line of sight (B-LOS) data transmission was required. HUMINT collectors do not commonly find themselves in situation in which they would require this baseline knowledge.

The team conducted a thorough analysis of capabilities with their authorized equipment for the purpose of developing a PACE plan that would account for redundant modes of communication, without being limited to satellite communications (SATCOM) capabilities alone. Their analysis revealed multiple communication modes that could satisfy their problem, though would require additional research and validation. Though the primary communications mode did rely upon SATCOM, the alternate communication mode provided a lower TI BLOS capability. 3rd BCT, 25th ID tested the use of a radio set manufactured by Harris Corporation known to the U.S. DoD as the AN/PRC-117G. This radio set can communicate across a wide spectrum of frequencies, SATCOM, a proprietary mesh network. This radio set can be connected to a laptop, server or router/switch to provide a data transition capability.

The team utilized the Harris AN/PRC-117G radio set to transmit data across a mesh network as the alternate communications mode. For their contingency communications mode, this radio set would be utilized for HF data transmission. Despite the limited bandwidth of transmitting data across an HF frequency, it is still a highly effective communication mode.

Ultimately, 3rd BCT, 25th ID successfully tested and validated the described HUMINT PACE Plan. This proved both a success for the unit, and was made available to the greater Army MI community through the publications of a detailed white paper and inclusion of an instructional block in the Digital Intelligence Systems Master Gunner Course. This exemplifies intellectual curiosity and the determination of our Soldiers. These HUMINT collectors, many of whom are Army Warrant Officers, chose to step

outside of their area of expertise to become subject matter experts (SME) in alternate methods of data transfer.

Protecting our Infantry with Scrap Materials – Saving Lives through Ingenuity

In 2007, while deployed to Afghanistan, 173rd Airborne Infantry Brigade sought to provide better armor for their troops along with increasing the field of fire for gunners atop tactical vehicles (Neuhaus, 2007). Soldiers of Company B, of the 173rd Airborne Brigade's support battalion, considered modification to gun turrets to rectify problems which Soldiers had complained of. The problem which existed surrounded the design of turrets, which dated to the 1990s. The unique challenges associated with conflict in Afghanistan included enemy engagements from high ground due to terrain features, in addition to engagements with larger caliber weapon systems. The turrets were designed with thin gauge steel plating known as "chicken plate". This early armor plating may stop small caliber weapons systems, but offered no protection against the weapons systems utilized by Taliban fighters. Furthermore, the designed armor plating provided no side or rear protection, which was responsible for loss of the lives of hundreds of Soldiers in the early years of Operation Enduring Freedom (OEF).

Soldiers, led by CW3 Sean Mager, the Brigade Mobility Officer (BMO) devised a concept to utilize scrap materials to fabricate a more robust armor turret. This modified turret provided gunners with 360 degrees of side protection along with top protection, including bulletproof glass so as to minimally impact visibility. This team of Soldiers utilized limited welding, fabrication and machinist capabilities to develop a modification that was quickly adopted by 173rd Airborne Infantry Brigade (Neuhaus, 2007).

Additional modifications were made to the weapon swing-arm attachment and mount system. This provided improvements to the range of motion so that gunners could engage enemy at a greater elevation, while controlling motion when required.

This solution, adopted by 173rd Airborne Infantry Brigade, not only saved lives, but cost little to retrofit the tactical vehicles. This "bright spot" did gain the attention of the Army Materiel and Tank and Automotive Commands. Later, the Target Behavioral Research Laboratory at Picatinny Arsenal would receive recognition for their Objective Gunner Protection Kit (OGPK) including Army's Top-10 Greatest Inventions of 2007 (Kowal, 2013). This is but a reengineering of the capability designed and employed by Soldiers of the 173rd Airborne Infantry Brigade while deployed to Afghanistan.

To many, this example of creative thought and ingenuity may be labeled a success. This design ultimately saved the lives of thousands of Soldiers, as most tactical vehicles have been retrofitted with the newly designed turret and OGPK (Robillard, 2010). The only real failure of note would be in that the team of Soldiers who, through their creative thought and ingenuity, created this turret system received no acknowledgement or recognition from the Army, nor the U.S. DoD. This particular example of an invention derived from the creative thought of Soldiers led to a multi-million dollar contract with the U.S. DoD, from which none of the Soldiers who were

responsible for the new design directly benefited. The Army has a program which offered financial compensation for such ideas known as the Army Suggestions Program (ASP). This program offers some recognition and reward, yet fails to adequately provide benefit for creative thought and ingenuity. The realization is that impact awards and monetary bonuses of $25,000 fail to adequately express what gratitude is expected of these inventive Soldiers. Other processes and procedures are in place which afford servicemembers the ability to attain patents for their intellectual property, though this relies on the servicemember to initiate and to defend the validity of their ideas.

There are many motivations for which persons will seek to develop solutions to complex problems. I would like to believe that when Soldiers develop such solutions, it is for the protection of lives, in which they hope to affect. Some may be motivated solely by intellectual curiosity, or rather a desire to solve such problems. Regardless of the motivation, however, our nation owes these Soldiers the proper acknowledgement. Not only should the U.S. DoD ensure that the intellectual property is protected, but that any further development affords these inventors the financial benefit that would be expected in the private sector. This becomes one additional method in which leaders, specifically our most Senior Leaders, can foster a climate that rewards creative thought and problem solving.

Conclusion:

So that our Army may continue to be the premier land component of the World, we must adopt new ideas and learn from our success. This may require taking risks that were once believed irresponsible. We must strive to solve complex problems in the face of a growing threat and in an operational environment that extends beyond the physical. Our Army must seek solutions from all available sources and make an effort to ensure that solutions are deemed worthy of the resources required to attain them.

It is imperative that our Army leaders seek out and identify early the likely candidates who will provide solutions that may lead to our success. Likewise, our Army leaders must provide ample reward and recognition for the ingenuity, creative thought and successful risks taken within our formations in efforts to solve complex problems. Not all problems require a complex solution, and yet creative thought is not as abundant as one would hope. Whether driven by intellectual curiosity, a desire to minimize lose or for other means, creative thought remains one of the Army's strongest assets. Though the current systems in place adequately identify faults and error, we must learn to emphasize successes. We must develop and implement a process which disseminates successes and failures across the U.S. Army, but that also focuses on a means to better the outcome. We must change our behavior, in that we seek out the solution, rather than looking for the cause of failure.

Bright spots await discovery. Our Army leaders must learn to identify these solutions, and must be empowered to offer resources in support of their development and implementation. Recognition and acknowledgement must be grander than impact awards. Furthermore, the Army must prove to these creative thinkers that protection of

intellectual property is of the utmost importance. Finally, the Army must be willing to unveil successes to the greater community through accurate reporting and accountability.

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