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Tactical Innovation in the Military: A Primer

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Saying the military needs to innovate is not novel. Every secretary of defense in modern history has made innovation a pillar of their strategy. They may have called it a revolution in military affairs, an offset, a transformation, reform, or modernization, but the intent was the same. Similarly, each of the military services' strategies expresses its desire to innovate. Today, the rise of peer competitors makes this an urgent imperative, and there is no shortage of intellectual energy directed at this challenge. Most of the effort, however, focuses on innovation at the strategic or enterprise level—the level of military services and above. There is less focus on how to foster bottom-up innovation.

Commanders and troops at every echelon want to innovate. They know that innovation at the tactical edge is critical. Though their units' focus is on generating and sustaining current readiness, they have a concurrent need to innovate—to ensure that the readiness they are generating keeps up with the competition over time. Their innovations may be smaller, cheaper, and less revolutionary than those the service or department pursues. They are, however, critical to winning battles. The benefits of operational units innovating can be profound. Over time, innovation becomes not just something a higher-level organization in the service does for the executors, but an enterprise-wide activity of which the executors are a part. Innovation grooms leaders who have led in this endeavor at every step of their career, so those select few who become strategic leaders have already built competency.

At its best, tactical innovation can have strategic impacts. This article, therefore, speaks directly to those commanders who lead tactical units and have a sincere desire to innovate, but may have only a vague sense of how to do it. It surveys the best available private sector and academic research on organizational innovation, adapts applicable best practices for military organizations, and offers practical recommendations to commanders and to the military services to make their units more innovative, agile, and adaptable.

Historical examples of bottom-up tactical innovation abound. The Stormtrooper tactics developed by the Germans in World War I revolutionized ground assault. They originated not

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with the Kaiser, but through the initiative and improvisation of actual troopers.[1] The legendary German "eighty-eight" artillery piece that inflicted devastating losses on Allied armor during World War II began service as an antiaircraft weapon until hastily repurposed by a German front-line battery to repel a tank assault in 1938.[2] The US military's refinement of vertical envelopment in the 1960s began with a single Marine unit conducting a hasty helicopter-borne assault during Operation Summit in the Korean War.[3]

The historical thread of tactical innovation continues unbroken to the present day. The Anbar Awakening, which turned the tide in the Iraq War, would not have been possible without enterprising small-unit leaders developing innovative counterinsurgency tactics on the ground between 2005 and 2007.[4] A few years later in Afghanistan, US Marine Floyd Holley tired of searching for improvised explosive devices with useless metal detectors and his bare hands, so he crafted a sickle-like tool from bamboo, duct tape, and a farmer's scythe. The Marine Corps took notice, mass-produced these "Holley sticks," and fielded them to all units deploying to Afghanistan. They saved countless lives and increased mobility. In 2021, the Army's Third Infantry Division employed commercial drones tethered to their fighting vehicles, improving their cavalry scouts' ability to conduct forward reconnaissance and increasing the depth of the battlefield. The idea was born in the unit's intelligence section and is now on its way to becoming an Army Program of Record.[5] Most prominently, the Ukrainian military's use of small, attritable drones to stem the Russian tide began not with a decision from Ukraine's General Headquarters, but with individual units and civilian hobbyists buying, building, and modifying whatever they could.

Military leaders at all levels are heeding these urgent lessons of history. The US Army, for example, is explicitly seeking to connect bottom-up innovation with top-down resources through its "Continuous Transformation" strategy.[6] Over thirty operational US Army units, ranging from brigade to corps, have established some sort of internal innovation cell. Many have established purpose-built "maker spaces" with tools and resources for soldiers to tinker and build with.[7] Equally impactful are the grassroots digital innovations occurring daily across the services. Tech-savvy service members are digitizing and streamlining burdensome processes, saving time and money as well as increasing lethality.[8] There is no question our young service members can innovate. The relevant question for our operational commanders is how they can best foster that innovation, steward it, and exploit it.

PRIVATE SECTOR VERSUS MILITARY

It is important to note up front that there are profound structural differences between the military and the private sector. These differences prevent us from blindly applying private sector best practices to military organizations. We can start with the three fundamental drivers of innovation in the private sector: the customer, revenue, and profit. The customer has a problem and is willing to pay a certain price for a solution that solves it. Revenue represents the aggregate value a firm creates by solving problems for customers. Profit measures the efficiency with which a firm generates revenue. Firms must have all three—customers, revenue, and profit—to exist over time.

Innovating in response to these drivers is an existential requirement for private firms. They innovate to serve additional customers, they innovate to solve more of their customers' problems, or they innovate to solve these problems better. Those that do this successfully survive. Those that don't eventually fail. Customers, revenue, and profit create a strong, continuous feedback loop driving innovation.

What is the military's analog for these corporate drivers of innovation? Theoretically, the customer in a military context is the American people, whose will is expressed through their elected officials. The military analog for revenue might be a unit's budget. The analog for profit might be how much under budget a military organization delivers a required capability or a unit of readiness. These analog drivers, however, exert weaker pressure than do corporate drivers of innovation, especially in peacetime. They fail to generate the existential need to innovate that exists in a private firm. Elected officials do not act as a true customer. They are ill-equipped to make informed "purchase" decisions. They suffer from information asymmetry inherent in the principal-agent problem, magnified by the monopolistic nature of the military.

It follows, therefore, that budget as revenue fails, because it is not true that specific military organizations must generate objective, quantifiable customer value in order to receive funding. They may generate value, but its measurement is subjective. Performing under budget as an analog of profit is completely unhelpful, as the perverse incentives of the government budget process incentivize a unit to expend 100 percent of its budget.

Further, the funds available to operational commanders are of the use-it-or-lose-it variety and are difficult to reprogram from one appropriation category to another. In short, the natural feedback loop incentivizing innovation in the peacetime military is inconsistent and weak.

Although we can't directly translate drivers of innovation in business to the military, we can look to Stephen Rosen's seminal work *Winning the Next War: Innovation and the Modern Military* for alternatives. Rosen identifies both the drivers of innovation and the conditions required for its successful adoption. "Peacetime innovation has been possible when senior military officers, with traditional credentials, reacting not to intelligence about the enemy but to a structural change in the security environment, have acted to create a new promotion pathway for junior officers practicing a new way of war."[9] Rosen's conclusion is quite specific and based upon a small sample of strategic innovations including radar, carrier aviation, and amphibious assaults. For our purposes, we'll generalize his conclusion.

First, innovation is more likely in response to macro trends, not subjective and perishable intelligence. Second, we can't simply outsource innovation to mavericks on the fringes of the professional community, important as they may be in the process. Innovation requires the commitment of credible and respected senior officers—consummate insiders—to drive it from ideation to implementation. Third, incentives must make innovation tangibly rewarding and career enhancing in the short and long term.

The drivers of innovation differ between the private and military spheres, and private industry clearly has advantages. However, we should not despair. The military has its own advantages. Military units are not profit oriented, but they are highly mission oriented. Well-led troops will work around the clock to accomplish a task or meet an objective. While the military cannot hire and fire the same way a private firm can, its ranks retain a competitive up-or-out system that incentivizes performance.

The military is limited in its ability to hire laterally, but commanders have enormous latitude to reassign and retask their people internally. Similarly, by virtue of their recruiting and retention model, the services onboard fresh, young talent continuously. The military boasts a culture of empowering young leaders, from the days of Prussian *Auftragstaktik* to today's philosophy of mission command.

Critics can rightly claim that tactical and operational units lack a budget for innovation. However, there are few obstacles to units innovating in the areas of organization, tactics, techniques, and procedures. Further, tactical units' ability to leverage adjacent units, their higher headquarters' resources, or even enlist industry support for experimentation is limited only by their energy and creativity. In sum, there is no compelling reason that commanders cannot harness these strengths to drive meaningful change and innovation in their organizations. They simply need the mandate, the incentives, and an understanding of how to do it. The rest of this essay will attempt to provide them with exactly that.

WHAT IS INNOVATION?

The term *innovation* means different things to different people. Legendary management consultant Peter Drucker viewed innovation as a disciplined process of identifying and exploiting opportunities for change to create value.[10] McKinsey & Company defines it as "the ability to conceive, develop, deliver, and scale new products, services, processes, and business models for customers."[11] A leading textbook on managing innovation defines it simply as "creating value from ideas."[12] Given that we are ultimately interested in innovating inside military organizations, we will adapt these definitions. *We will define innovation as the process of generating, testing, and implementing new ideas to create competitive advantage*. This definition states that the idea must be new, or at least new to the organization considering its adoption. The organization must both generate and implement ideas, two linked but different processes. The new idea must create a competitive warfighting advantage, even if indirectly.

This definition is scalable to every level, and across all warfighting functions. An administrative section devising and implementing a more efficient system for checking personnel into or out of their unit, thereby freeing up time for readiness-generating training, is an innovation. A motorized battalion making a change to its internal maintenance process that increases vehicle availability is an innovation. An infantry battalion developing a new tactic for integrating unmanned systems is an innovation. A corps command developing software interfaces to shorten the kill chains of supporting arms is an innovation.

In *The Innovator's Dilemma*, Clayton Christensen categorizes innovation as either sustaining or disruptive.[13] Sustaining innovations improve upon existing products or services by adding newer and better features for which demanding customers are willing to pay. Disruptive innovations are those that target less discriminating customers with a different, cheaper, and (at least initially) less capable product to solve these lower-end customers' problems, nibbling market share away from higher-end incumbents. These higher-end incumbents initially ignore the innovation, as they are unconcerned with the low end of the market. The disruptive innovation, however, improves, scales, eventually threatens, and potentially renders extinct the incumbent. In the end, it provides the same customer value more cheaply and efficiently.

In a military context, the modernization of manned fighter aircraft from one generation to the next, from F-4 to F-18 to F-35, is a classic sustaining innovation. New versions meet the needs of the most demanding aviation missions. Small drones are a perfect example of a disruptive innovation. The least discriminating customer for manned aircraft is small units of conventional ground forces. They therefore receive a limited allocation of sorties. Commercial drones, however, meet the less demanding requirements of these small units exceptionally well. Initially, these drones are no threat to manned aircraft. As they improve their range, sensors, and payload, however, they begin to assume missions higher up the value chain, such as electronic warfare and strike. At this point, it is a foregone conclusion that unmanned aircraft will assume greater and greater market share from manned aircraft over time.

This situation is similar to the early days of naval aviation, when aircraft served primarily as scouts for the surface fleet because of their limited range and payload. Few anticipated that less than three decades later naval aviation would replace the battleship as the main offensive strike arm of the fleet. That is disruptive innovation.[14]

Just because sustaining innovations improve existing products or services doesn't mean they are unimportant. They can be profound and decisive to an outcome. The replacement of analog fire-control systems with digital systems was a sustaining innovation. It didn't fundamentally change the process of acquiring targeting data, calculating firing solutions, and delivering ordnance, but it did these tasks exponentially faster and more accurately, creating incredible competitive advantage. Continuous and incremental advances in the range, maneuverability, speed, and precision of missiles are sustaining innovations but are nonetheless critical to success in the next war. The takeaway for commanders is that both disruptive and sustaining innovations are real sources of competitive advantage.

Unfortunately, it is difficult for organizations to disrupt themselves. Because the organization is so committed, structurally and culturally, to its core customers and its core business, it is unlikely to cannibalize that core business in pursuit of a disruptive innovation. This is the crux of the "innovator's dilemma" as described by Christensen.

James Q. Wilson studied the same phenomenon in governmental organizations. He noted that "changes that are consistent with existing task definitions will be accepted; those that require a redefinition of those tasks will be resisted."[15] He points out that the US Army

happily replaced horses with trucks because the transition didn't fundamentally alter the task. Conversely, the Army resisted adopting breech-loading rifles and machine guns because they required the massive dispersion of troops and decentralization of command and control, something unpalatable to commanders of the close-order mass formations of the nineteenth century. All else being equal, military organizations more easily accept sustaining innovations than disruptive ones.

INNOVATION STRATEGIES AND FRAMEWORKS

We have reviewed the drivers of innovation and what innovation is. We now turn to the heart of the matter: how to do it. There are at least as many innovation strategies as there are consulting companies trying to sell their innovation-coaching services. Most of these strategies, however, derive from only a few differentiated approaches. We will describe only the most prominent of them. These strategies were designed primarily with private enterprise in mind, but we can apply the broad concepts to military organizations at echelon. We'll review the three most popular strategies: design thinking, lean, and blue ocean.

Design thinking evolved in the latter half of the twentieth century. Tim Brown, the founder and CEO of design and innovation company IDEO, popularized it.[16] Design thinking is so named because it encourages people to think like designers, is human focused, and centers on gaining a deep understanding of the user experience for a particular innovation.

Brown uses the classic example of Thomas Edison to describe this. Edison understood that the light bulb would fill a profound user need, and then he went on to build the ecosystem (the power generation and transmission infrastructure) that supported the user-focused light bulb. Design thinking comes in many flavors and is a field unto itself, but the basic framework involves three steps: inspiration, ideation, and implementation.

Design-thinking approaches to innovation involve early and continuous immersion in the user experience by the innovation team, through firsthand observation and study. These approaches involve prototyping early and often, ideally within the first week of a project. Design thinking in innovation shares common intellectual ancestry with the military planning framework Systematic Operational Design (SOD), but the two applications are entirely different.[17]

In the context of tactical innovation, design thinking would advocate that innovation leaders spend significant time with front-line operators to really understand their problems and needs, that they keep the end-user problem fixed in their mind throughout the innovation process, and that they rapidly and iteratively prototype, whether that prototype is a thing, a tactic, or a process. It would be an approach that seeks to solve current warfighting problems through a ruthless firsthand focus on warfighter needs.

Lean startup methodology was proposed by entrepreneur Eric Ries in the 2010s.[18] In it, Ries combines the work of entrepreneur Steve Blank and the well-established lean manufacturing

process that made Toyota the biggest automobile manufacturer in the world. Lean is more philosophy and principles than process. It relies on cross-functional teams and rapidly and repeatedly executing a *build-measure-learn feedback loop* that informs the team whether to remain on course or pivot.

Lean argues that an organization should rapidly produce a minimum viable product as part of that build-measure-learn cycle. The framework encourages rapidly cycling through many small and inexpensive failures to eventually arrive at the desired outcome—an effective and profitable solution. Ries also emphasizes the importance of the hierarchical relationship of vision, strategy, and product. Vision has primacy, strategy is subordinate to vision, and product follows.

Empirical studies on lean startup outcomes compared to those of traditional approaches indicate that lean policies can reduce investment by as much as two-thirds and more than double return on investment.[19] In a tactical military context, lean overlaps with design thinking in its focus on rapid experimentation and learning from failure. It would include rigorous data collection and analysis throughout. It would emphasize speed and risk tolerance.

The third innovation framework we'll review is the blue ocean strategy, developed by W. Chan Kim and Renée Mauborgne, professors at the INSEAD business school.[20] The metaphoric title describes the strategy. Most firms compete in oceans filled with sharks, or red oceans. Competition is brutal, margins are slim, and advantage is fleeting. Blue oceans are new markets that have few sharks (competitors) and that are either separate from, or fenced off inside of, red oceans.

The essence of the strategy is what the authors call "value innovation," whereby "instead of focusing on beating the competition, you focus on making the competition irrelevant by creating a leap in value for buyers and your company, thereby opening new and uncontested market space."[21] The authors cite Cirque du Soleil, Southwest Airlines, Uber, and others as examples of successful blue ocean firms. They created new market spaces in which there was little to no competition.

In a military context, the blue ocean strategy is like the "third offset strategy" pursued by the late secretary of defense, Ash Carter, and his deputy Robert Work.[22] This strategy didn't seek to compete with adversaries strength-on-strength but instead sought to render their strengths irrelevant through a US advantage in a new competitive space. It is the strategic equivalent of flanking, bypassing, or enveloping an enemy.

Robert Work described the First Offset as the US development of a tactical nuclear arsenal in the 1950s and the Second Offset as US dominance in precision munitions and battle networks. He searched for, though never quite settled upon, a Third Offset. In an operational context, expanding the competitive space through an indirect approach resembles the blue ocean strategy. Iran's employment of proxy forces throughout the Middle East, the Allies' Operation Torch in North Africa during World War II, and the development of vertical envelopment can be viewed as blue ocean innovations.

In our tactical military context, a blue ocean strategy intersects John Boyd's OODA (observe, orient, decide, act) loop.[23] How can I set the terms of the fight? How can I change the rules of the game? How can I render adversary advantages irrelevant? It is the innovation equivalent of bypassing an enemy strongpoint.

A helpful companion to these frameworks is the McKinsey & Company's Three Horizons model.[24] It offers companies a way to simultaneously manage both current and future opportunities for growth. Horizon One represents business units of an enterprise whose value is in their execution of core business activities, or executional advantage. Horizon Two represents business units whose value derives from their ability to take advantage of trends and opportunities relative to their competition, giving them positional advantage. Horizon Three business activities derive their value from their insight and foresight about future opportunities that do not yet fully exist, providing visionary advantage.

Importantly, innovation occurs at each horizon, but the level of risk assumed and the scope of the innovation rise as you move from Horizon One to Horizon Three. It follows that the key metrics and performance evaluation of an organization depend on the horizon at which they derive their value. To simplify it, the key metric in Horizon One is profit, in Horizon Two it is revenue, and in Horizon Three it is milestone or market based.

Finally, the leaders of these different horizon activities fit different profiles. Horizon One leaders tend to be experienced business managers. Horizon Two leaders tend to be experienced business builders. Horizon Three managers tend to be so-called idea champions and visionary people.

The idea of viewing operations as near-, mid-, or long-range is not novel, and almost every military organization does so. The linkages among the time horizon, performance metrics, incentives, risk tolerance, and leader traits, however, are more interesting. Tactical units will find themselves innovating primarily in Horizon One and selectively in Horizon Two. Horizon Three innovation may involve their participation but would be led by enterprise-level organizations and requires commensurate resourcing.

Lean, design thinking, blue ocean, and Three Horizons are primarily corporate frameworks, but a tactical leader, with some creativity and will, can apply their core tenets. Tactical leaders can deliberately and continuously search for unsolved warfighter problems at the tactical edge and ensure that their customer, the warfighter, remains central throughout their innovation process. Tactical leaders can embrace a rapid prototyping and experimentation culture, which means being analytical and embracing failure. They can seek to expand the competition space in their tactical sphere, seeking ways not only to defeat an adversary capability but to do so by making it irrelevant.

While these frameworks serve as mental models for our approach to innovation, we still need to know how we do it. For that, we can look at specific characteristics of innovative organizations. What organizational culture, values, and behaviors are likely to foster innovation?

CHARACTERISTICS OF INNOVATIVE ORGANIZATIONS

AMBIDEXTERITY

Most organizations that are not startups or incubators have a challenging dual mandate: They must balance exploitation and exploration.[25] They exploit their current processes, resources, and knowledge to be successful today. They explore possibilities and opportunities to position themselves to be successful in the future. Achieving this balance is key to long-term success, and it is a difficult balancing act.

The core challenge is that organizations naturally tend toward exploitation and avoid exploration. Exploitation results in an organization doing what it has always done, but incrementally better over time. Exploitation is efficient and its returns are positive and predictable. Exploration is less efficient, and its returns are uncertain. The better an organization is at exploitation, the higher the opportunity costs of exploration.[26] This phenomenon is a close cousin of the innovator's dilemma.

For an organization to be ambidextrous and achieve this delicate balance between exploitation and exploration, leadership matters. A longitudinal study of thirteen different business units found that ambidextrous organizations were more successful in innovating, and it identified several key attributes of these organizations.[27]

First, there was unity of command. A single general manager oversaw both exploitation and exploration. The manager had subunits conducting typical core business exploitation practices and subunits exploring and innovating. In the successful examples, the "locus of exploratory innovation was with the general manager and the senior team."[28] We can view the general manager, in this context, as a unit commander who owns these multiple, heterogenous subunits.

Second, while general managers are critical, they do not operate in a vacuum. Senior leaders above them must provide the necessary "political, social, and financial support to the ambidextrous manager."[29] These are the first two and most important conditions. The unit commander must be ambidextrous and must have strong support from the higher headquarters.

Third, general managers must also allow exploration subunits and exploitation subunits to be different. They need different performance metrics, culture, and incentives.[30] An ambidextrous leader encourages and protects this heterogeneity in subunits.

This notion of ambidexterity in tactical units is beginning to proliferate. In 2023, the 82d Airborne Division established Gainey Company with the exclusive mission of innovating in support of the division's warfighting units.[31] In 2021, the 75th Ranger Regiment established Project Galahad, essentially an innovation unit within the regiment beholden directly to the regimental commander.[32] Inside these sorts of subunits, the work culture, environment, and mission are necessarily different from those of the larger command. The success of these efforts, and others like them, requires commanders to be ambidextrous.

ABSORPTIVE CAPACITY

Innovative organizations are learning organizations. They take in information, innovate, and rapidly diffuse that innovation throughout the organization. Organizational behavior researchers call this "absorptive capacity." An organization's absorptive capacity is a function of its individuals' capacity and the organization's practices. Individuals with more experience and more connections with experts outside of their organization have a higher absorptive capacity. High-capacity organizations deliberately create external connections and internal mechanisms for open information sharing.[33]

In a military context, this looks like a unit that engages up and out proactively, both formally and informally. Members are encouraged to build relationships outside the chain of command and share information widely across other disparate organizations, not just those higher and adjacent units with which they have a formal relationship. Such a unit also has internal fora, from professional development to cohesion building, that help information and ideas flow into, out of, and through the organization. Absorptive capacity results from both culture and practice.

FAILURE ANALYSIS

Advising military commanders to fail fast or to embrace failure is well-intentioned but incomplete advice. In operational units, commanders cannot tolerate failure in critical missions and tasks. Nor should commanders regard every failure as an inherently positive learning experience. Failure resulting from negligence, complacency, or deviance is not laudable. Failure resulting from aggressive exploration and experimentation is. Leaders need to respond accordingly.[34]

Operational commanders need to be deliberate and explicit regarding what failures they will accept, what failures they will not, and in what areas they will assume risk. Similarly, rigorous failure analysis should be standard practice. While this theoretically happens during after action reviews (AAR), it requires an environment of openness, probing analysis, and psychological safety to be truly effective. If a leader does not deliberately create this environment, AARs become exercises in superficial analysis and blame avoidance.

Failure analysis is uncomfortable. It requires leaders who can receive bad news gracefully and look for the opportunity in the unwelcome opinion. Failure to do this single, simple thing is what former Silicon Valley executive and Secretary of Defense Bill Perry identifies as the most common reason defense secretaries fail. "They don't get opposing points of view anymore, and they make big mistakes because of it."[35]

TEAM COMPOSITION

For the sake of a compelling narrative, we often attribute an innovation to the heroic efforts of a single person—a Steve Jobs or a Robert Oppenheimer. Central as they were, these men led teams, and those teams innovated. Constructing a team with the right skills, personalities, and behaviors is critical.

Certain competencies and personality types need to be present on an innovation team to maximize its chances of success. In "Personal Characteristics of Innovators—An Empirical Study of Roles in Innovation Management," the authors identify four distinct roles represented in most successful innovation teams. These are expert promoter, power promoter, process promoter, and relationship promoter. The authors state the following:

> The expert promotor has specific technical knowledge to advance the idea, to find new solutions or to refine the proposed solution. The power promotor has the necessary hierarchical power to drive the project, to provide needed resources, and to help to overcome any resource related obstacles which might arise during the project. The process promotor derives his influence from organizational know-how and intra-organizational networks. He makes the connection between the power and the expert promotor and has the necessary diplomatic skills to bring together the people needed for the innovation process. And last but not least, the relationship promotor who has strong personal ties not only inside but especially outside the organization, i.e. to customers, suppliers, and research partners, facilitates inter-organizational cooperation."[36]

The word *promoter* is key here. These roles don't just require expertise and competency; they require enthusiastic buy-in. Key members must be willing not just to participate in, but to *promote* the project. These tend to be self-driven people with a high need for autonomy. A commander building an innovation team would be well served to deliberately select people for these four critical and complementary roles.

Diversity matters, but in specific ways. Functional diversity in a team strongly supports innovation. Unsurprisingly, the more relevant cross-functional expertise is present in a team, the more innovative it is likely to be. Research is inconclusive, however, as to whether other forms of diversity (age, gender, ethnicity) matter. Some studies indicate diversity can be helpful, while others disagree. Most agree that very diverse teams will need engaged leadership to prevent the team's heterogeneity from becoming an unconstructive source of friction.[37]

Finally, behavior matters. A team interacts through social processes. Research clearly identifies that "open internal communication, trust, and psychological safety seem to be critical processes that influence team creativity and innovation."[38] Team members need to willingly offer ideas and thoughts that threaten the status quo, an inherently risky activity if these team members do not feel safe and supported by both the team and the broader organization.

RISK-TAKING AND INCENTIVES

Risk is inherent in innovation. Innovation requires an organization to take a chance on something with an uncertain outcome at the expense of the status quo. There are individual losers in innovation, people in an organization whose expertise or function is rendered less relevant, for example.[39] A leader who attempts to innovate risks potentially negative career outcomes. Since most human beings are rational actors, people need incentive to take risks.

We must acknowledge that the military, indeed the public sector overall, does a poor job of incentivizing risk-taking. In the public sector, "the benefits of an innovation are spread over a large number of recipients, difficult to measure, and uncertain. In contrast, the costs . . . are almost certainly measurable, specific, and traceable to the decisions of individuals."[40] This is the natural state of government organizations that commanders must overcome if they wish to innovate in their units.

Military leaders are not inherently risk averse, but they exist in a peacetime military system that often discourages risk-taking. To explain, let's compare two very different risk distributions, those of Silicon Valley and that of a military commander. Silicon Valley startups and the venture capitalists who fund them have a risk profile that incentivizes innovation. Their successes are infrequent, but the associated payoffs can be enormous. Their failures are frequent, but the accompanying losses are limited.

If a startup fails, the founders and employees are temporarily out of work, but they typically find a ready market for their skills. The venture capitalist loses their investment, but they have hedged that risk across a portfolio of investments. If the startup is successful, the founders, investors, and early employees make returns many times that of their initial investment. Their upside is theoretically infinite. The distribution of risk in the startup world encourages smart risk-taking in pursuit of innovation. Risk is the whole point. They are in the business of seeking out and exploiting risk.

In contrast, the distribution of risk for a military commander, at least in peacetime, discourages innovation. The downside risk exceeds the potential upside benefit. If a commander takes a risk in pursuit of innovation and it fails, at worst they face career-ending sanction. If they take a risk and it succeeds, at best they keep their job and get a good performance evaluation.

Someone attending a military staff meeting will hear leaders talk of managing risk, mitigating risk, and accepting what residual risk they must. What is much less likely to be heard is that leader talking about exploiting or leveraging risk. While this is a perfectly rational way to prevent catastrophic failure or death, the framing itself can have the unintentional effect of cowing the force. As a senior officer once advised me when we were reminiscing about colleagues who had been relieved of command, "If you're thinking of doing something bold, don't."

While senior leaders may want innovative commanders, there is little explicit institutional incentive for commanders to innovate. Consider what military commanders must explicitly do. They must generate and report current readiness via the Defense Readiness Reporting System. They must maintain a healthy command climate, as measured by the Defense Organizational Climate Survey. They must pass an annual regimen of formal inspections whose combined checklists fill thousands of pages across dozens of functions. Though these inspections differ slightly from service to service, they include things like an inspector general's inspection, a commanding general's inspection, a maintenance inspection, and an administrative inspection.

These inspections are designed to make sure a unit is doing everything exactly as prescribed. They don't explicitly discourage organizational improvement through innovation, but they don't reward it either. A commander must have a satisfactory motorcycle safety program, voting assistance program, postal program, equal opportunity program, and dozens more. Innovation, however, is optional.

The solution is not to incentive military commanders the same way one would a business unit executive. Military units do not produce profit, and commanders should not receive financial bonuses for performance. That is antithetical to the servant-leader culture that is at the core of effective military organizations. There are ways, however, to rebalance this asymmetry of risk.

Personnel evaluations could more explicitly assess how innovative a leader is and how much value they add. Did they lead their unit forward, creating competitive advantage, or simply steward it? Similarly, the official inspections to which every unit is subject annually can include audits of new initiatives and innovations. This innovation audit would enable a commander to "get credit" for adding novel value while still ensuring that they are adhering to critical processes. While these bureaucratic solutions would surely produce some innovation theater, they would also generate meaningful innovation along the way.

Outside of service-level reform of institutional processes, commanders at every echelon can simply state the explicit expectation that their subordinate leaders innovate to improve their organizations and then follow those expectations up with actions and evaluations that reward the innovations. They can build it into their philosophy, guidance, plans, and battle rhythm to operationalize it. They can demonstrate, through words and actions, that they will protect subordinates taking well-intentioned risks.

While command is not exercised in a vacuum, commanders do have significant ability to define success for their units and their people. I felt this firsthand when I led an innovative effort on behalf of a Marine division. We were considering some outside-the-box things, and I was concerned about the risk we would incur on behalf of the division. I raised this concern with the commanding general during a progress review. In response, he told me, "I'm not willing to risk Marines' lives for this, but I'm willing to accept a whole lot of risk everywhere else to make it happen." That simple but powerful statement was all I and the team needed to proceed at full speed. It provided explicit risk tolerance and implicit incentivization.

We need to include a caveat here lest we create perverse incentives. Incentivizing smart risk-taking and rewarding innovation is not analogous to rewarding every new thing. Creating new things to pad evaluations is not innovation and does not create value. It is innovation theater and it degrades value. An innovation that does not create competitive advantage shouldn't bring condemnation, but it should be rapidly culled.

TIME AND SPACE

Individuals and teams need "autonomy and space for idea generation and problem solving."[41] Several prominent companies base their policies on this finding. 3M, a large manufacturing

company with an impressively long history of successful innovation, employs the 15 percent rule: Employees can spend up to 15 percent of their time working on projects or problems of their choosing. As the previous 3M chairman said, "Encourage experimental doodling. If you put fences around people, you get sheep. Give people the room they need."[42] Google has had a similar 20 percent rule for years. Atlassian, a famously innovative Australian software company, sponsors dedicated innovation days and weeks throughout the year.[43]

These companies also know that grassroots innovation requires not just time, but also pressure. Atlassian calls it "just enough" structure, an example of which is its quarterly "ShipIt" events. During these twenty-four-hour hackathons, teams receive discrete problems to solve and only twenty-four hours to sketch out a feasible solution.

Similarly, Clayton Christensen recommends that leadership be "patient for growth, but impatient for profit."[44] In our tactical military context, we can interpret this as the idea that leaders should be impatient in testing whether an innovation can provide practical value to the warfighter. They need to test it early and often. They can be more patient in determining scalability across the larger organization.

As a review of academic research sums it up, "Time limits for idea creation and problem solutions should be set, particularly in the implementation phases."[45] In innovation, just as in military planning, teams must eventually stop admiring a problem and start solving it. As every commander knows, a good rehearsal is better than a great plan.

It is easy to say one should create time for innovation, but operational units are not awash in free time. Adding a mandate to innovate on top of an already full workload will not produce the desired result. Leaders can overcome this, however, with deliberate action and force of will. Commanders can lead their units to do fewer low-value things and replace them with high-value activities.

The *Harvard Business Review* article "How to Give Busy People the Time to Innovate" derived lessons learned from interviewing executives at innovative companies.[46] These lessons are equally applicable to military units. The first lesson is to *clear process debt*. The information trackers, irrelevant meetings that remain scheduled, and reporting requirements that do nothing but build "situational awareness" are examples of process debt that a forceful commander can clear. The second lesson is to adopt the organizational rule that no one can add a new initiative or project *until we take something away*.

These first two lessons are powerful. Even if they don't always result in meaningful innovation, they will reduce frustration and unnecessary work. A third lesson is to *separate exploration and exploitation*. This can mean certain teams focus exclusively on exploration. Alternatively, it could mean that a unit dedicates certain days or weeks to exploration. Either can work. The common thread with all these lessons is that they start at the top. In the military context, only unit commanders can truly implement these steps in their organizations.

RECOMMENDATIONS AND CONCLUSION

Any good tactical primer distills the simple from the complex. Practical, actionable recommendations follow.

RECOMMENDATIONS FOR COMMANDERS

1. *Be ambidextrous*. Deliberately choose your balance of effort between exploitation and exploration. It will vary from unit to unit and over time, but it is a decision. Your unit will spend most of its time on exploitation—getting better at doing the things it must do. Your unit should spend some of its time, and perhaps all of some people's time, exploring, turning ideas into competitive advantage. Separate the two activities by time or personnel. Exploiting and exploring simultaneously generally does not work.

2. *Search for opportunities and prioritize.* Determine the areas in which your unit will explore and innovate. Think big and look for ways to change the rules of the game to render an adversary's advantage irrelevant. These disruptive innovations are hard but create leap-ahead opportunities. Think small and look for those myriad inefficiencies and redundancies that your team can improve. These sustaining innovations can also create powerful competitive advantage. Focus relentlessly on front-line warfighter requirements throughout the process from ideation to implementation. Don't let perfect be the enemy of good enough. Pick a problem to solve and start solving it.

3. *Pick the right structure*. Determine whether you can accomplish the innovation you seek through your existing structure and staff process. If the innovation doesn't threaten deeply entrenched interests, values, or ways of doing business, you likely can. Otherwise, you need to establish an independent subunit in your command and give it direct access to you.

4. *Form the right team.* Form a team that is just big enough. Ensure cross-functional expertise. Consider personalities. You will need technical expertise, organizational process expertise, relationship-building skills, and enough weight and influence on the team to champion the project. Be initially patient and allow low-pressure idea generation. Then be impatient and impose deadlines for testing and implementation.

5. *Increase your unit's absorptive capacity.* Connect individuals and units intra- and inter-organizationally. Set conditions for information to flow freely into, through, and out of your organization. Get your team competing in the marketplace of ideas. You can do much of this under the umbrella of a creative unit professional military education program that leverages internal and external sources.

6. *Create time and space to innovate.* Set time aside on the calendar for some or all of your people to explore. Hackathons, unstructured exploration time, and exercises expressly focused on experimentation are examples. Practice addition by subtraction: Identify those low-value things your people are doing, stop doing them, and reinvest that energy into innovation.

7. *Reward the right failures.* Be intolerant of blameworthy failure, encourage praiseworthy failure, and make sure your people know the difference. Conduct deliberate failure analysis in a high-trust environment.

8. *Create incentives and accept risk.* Create an environment where the upside rewards for innovating are greater than the downside risks. An explicit mandate from a commander to innovate will go a long way toward promoting innovation. Coupling that mandate with evaluations and awards that reward innovative risk-taking, even when unsuccessful, goes even further. Commanders must protect subordinates from the career risks of investing their time and reputation in a novel effort. Identify, engage, and overcome the "frozen middle" who does not share your vision or risk tolerance.

9. *Delegate, but don't abdicate.* In the same way that a staff planning effort requires regular commander involvement, so does innovation. As an operational planning team requires a commander's guidance up front and frequent feedback throughout, so does an innovation team. Implementation of an innovation will take a commander's sustained energy and will. It is not enough to get out of the way; a commander must forcibly clear a path.

INSTITUTIONAL RECOMMENDATIONS

1. *Set expectations.* Issue the mandate for commanders to foster bottom-up innovation. Include it in service guidance. Army Futures Command's "Transformation in Contact" concept that calls for operational commanders to exploit near-term opportunities is a step in that direction.[47]

2. *Inspect what you expect.* Military services formally inspect dozens of functional areas and programs in every single command, from motorcycle safety to administrative soundness. These inspections communicate to commanders what they must do. If the services believe bottom-up innovation is something they must do, then inspect it. While this bureaucratic approach may produce some innovation theater, it will also foster successes.

3. *Resource it.* Make funds available for field grade and general officer operational commanders to fund innovation efforts at their level. The amount is less important than the signal it sends.

CONCLUSION

Senior military leaders often repeat the refrain that innovation is in our DNA. That makes it sound easy, as if it simply happens. Unfortunately, innovation rarely happens so organically. It results from leaders' deliberate decisions, their resolute actions, and the organizational climate they carefully cultivate. If we are serious about sowing the seeds of tactical innovation, then we ought to seriously study it. Fortunately, military leaders eager to innovate needn't grope about blindly. They can leverage a deep pool of research, much of which derives from the private sector. This essay has endeavored to make this research accessible and consumable for the military commander.

In innovation, as in combat, there is no process or standard operating procedure guaranteed to succeed. Uncertainty and friction pervade on the battlefield. Commanders accept this, embrace it, and seek to exploit it. They make a plan, set conditions, and apply sound tactical principles in violent execution. Commanders seeking to innovate ought to take a similar approach, and this primer gives them a warm start.

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