

Data-Centric at the Division

3rd Infantry Division's One-Year Journey to Transform and Modernize

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In a May 2021 memorandum to senior leaders, Deputy Secretary of Defense Kathleen Hicks called upon the Department of Defense (DOD) to transform into a “data-centric organization.”¹

With the DOD seeking ways to make data accessible and easier to integrate, the Army issued the *Army Data Plan*.² This plan boldly referenced the theory of creating cultural change by treating data as a strategic asset. This falls back to the adage that, in theory, there is no difference between theory and practice, while in practice there is. Bridging the gap between theory and practice in this case requires clearly defined and scoped projects in which data use enables operational success. Because every act of creation begins with destruction, the 3rd Infantry Division (3ID) began its journey toward becoming more data centric from a stance of self-reproach and challenging foundational practices and assumptions. The first realization we encountered on our journey was that we do not lack access to data. Meanwhile, the degree

of organizational atrophy and immaturity in drawing insights presented a persistent roadblock to manipulating the overwhelming amount of data available to us.³ Well-meaning but superfluous acts across the staff to measure and see ourselves in space and time have created a cacophony, resulting in nearly useless meetings dominated by aimless and stale PowerPoint slides. Already overwhelmed, demoralized, and institutionalized by the Army's hasty digital transformation of decades past, our organization began its journey toward becoming data centric in June 2023. As the next wave of innovation and automation is on the horizon, the sin of omission in failing to institute cultural change prior to technical change will lead to us layering the same types of inefficiencies that resulted when we applied a digital façade to the anachronistic, paper-driven bureaucracy of the 1990s. While it is easy to place the blame for our misfortunes on software like PowerPoint, it takes more courage to question business practices and administrative



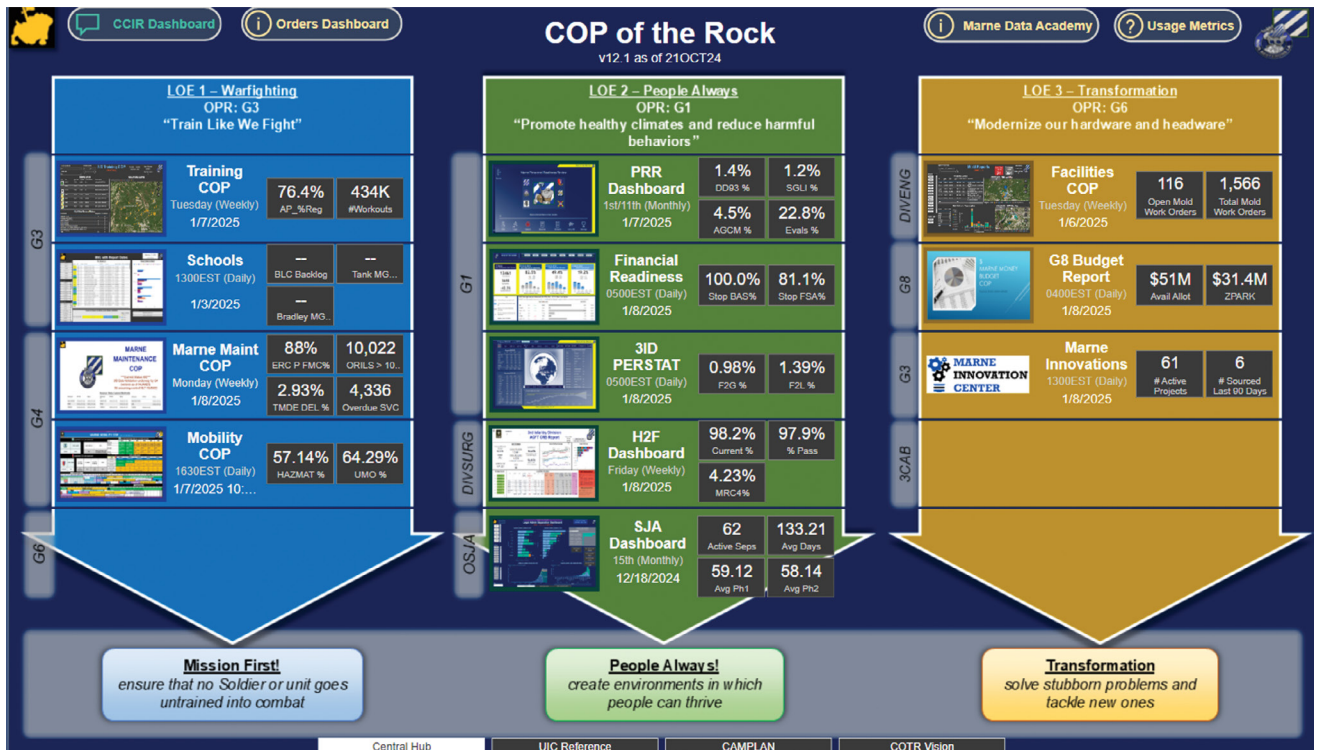
3rd Infantry Division staff conduct battle drills in preparation for Austere Challenge 24 in March 2024 while deployed in support of Operation Atlantic Resolve. (Photo courtesy of the 3rd Infantry Division Public Affairs Office)

productivity. This article aims to share the 3ID's successes and failures through its one-year journey of becoming more data centric, specifically highlighting that much more than technical innovation is required to succeed. While an approach to organizational change is beyond the scope of this article and stated better elsewhere through more qualified proponents, we realized that our success was predicated on a unified approach.⁴ This approach included systems-based solutions and behavioral changes to comprehensively refine our business practices. The 3ID's common operating picture (COP), branded within our organization as "COP of the Rock" (COTR), was built from the ground up to achieve our approach to becoming more data centric. The stated goal of our COP is to transform our culture through advancing technology, operations, and processes to achieve tangible outcomes. By building our organization around the efficient use of data, we reduce staff burden in collecting data

and consequently empower leaders to make faster, better-informed decisions with improved prognostic capability (see figure 1).

Optimizing for Process, Not Outcome

As Army professionals, we all need to learn how to become data centric.⁵ A cursory understanding of what is possible with recent advances in artificial intelligence, machine learning, and large language models (e.g., ChatGPT) can further obfuscate the growing pains necessary to ensure that cultural changes and workforce upskilling keep pace with technical innovations. While private enterprises must enshrine data-centric practices to survive in an era of increased competition and workforce changes, government agencies face a different existential threat. Instead, they must wrestle with an entrenched bureaucracy likely to resist innovative changes to business practices that could threaten a workforce



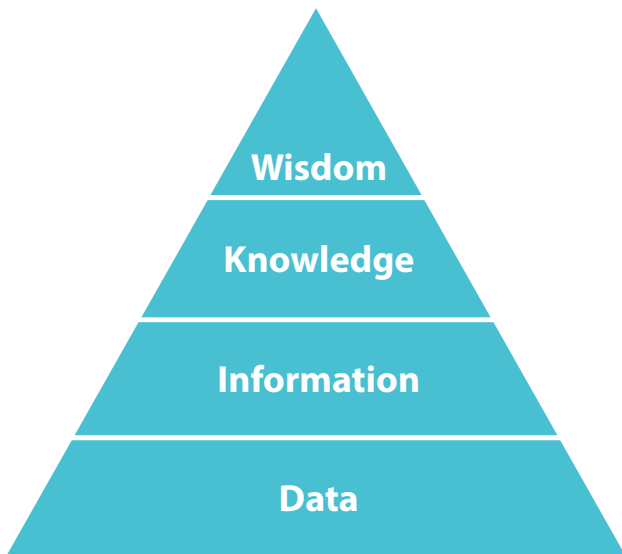
(Figure by Daniel R. DeNeve)

Figure 1. COP of the Rock

through compulsory upskilling or exposing wasteful and inefficient labor. While there is likely a small audience of Army professionals interested in uncovering the painstaking (and dull) technical details of how we created a division common operating picture to ultimately transform our culture, the biggest pieces of the puzzle and greatest amount of friction exists where our workforce and processes intersect. Behind every successful strategy is a collective organizational energy and story more fundamental and explanatory than the digital footprints of success. We aim to define a level of shared understanding necessary to understand how what we went through can translate to disparate formations across the Army. Beyond the operational approach and series of dashboards built to enable our progression through the information hierarchy (see figure 2), organizational change is even more fundamental than the data itself.⁶ Leaders must have strategic patience and a sufficient understanding of how to communicate with data before capitalizing on the pervasive artificial intelligence hype that is at the forefront of popular culture. It may take years to get the fundamentals right until enough data is available to train machine learning algorithms and

large language models. Just as high-profile tech companies undergo a journey before reaching their destination, organizations are better positioned to reach their destination by adopting a posture of strategic patience and a willingness to persevere through a period of slight disarray as business practices evolve through a period of self-induced environmental stress.

The 3ID's campaign plan served as the framework for operationalizing our approach to becoming more data centric. Rather than adding the goal of becoming data centric and data literate as a means to its own end, we aligned data-driven end states across the division's campaign plan lines of effort. We further modified our existing battle rhythm and assessment framework to incorporate data into everything we do. By not viewing our approach to data as an additional burden but rather as a resource to accomplish short and midterm measurable actions, we reduced the inherent tension in calling for change without giving a clear mandate on exactly how, where, or why we should change. With a critical tenet behind the use of data being to unburden leaders and staff, a coalition of willing data champions naturally emerged across the division. Leaders and staff



(Figure courtesy of Wikimedia Commons)

Figure 2. DIKW Model

were aligned behind a central thesis that our current business practices were slowing us down, are human resource-intensive, and are unnecessarily cumbersome. By efficiently organizing processes to support our campaign plan priorities on a common platform (our division COP), we projected a reduction in email by 50 percent (situation reports, duty reports, protocol emails, request-for-information traffic, staff notes). We further predicted an increase in the effectiveness and reduced frequency of meetings. Most importantly, we projected a significant curtailment of time-intensive activities (e.g., building PowerPoint slides).

The realization of all these predictions would come to pass despite encountering a series of false starts at the outset. These false starts generally originated from platitudes and overly simplistic communication. For example, as our incoming division commander initially communicated his dislike for PowerPoint and his desire to evolve beyond using this inefficient medium, staff took his advice perhaps too literally and re-created PowerPoint-style presentations in alternative software (e.g., Excel). Pulling the thread further on software, the tool used for the job shapes the psychology and outputs of the meeting it is presented within. We realized that PowerPoint is primarily a sales and presentation tool designed to create visually pleasing presentations. Its merits are a detriment to synthesizing information and sharing access to knowledge across the organization.

By choosing the right tool for the job, organizations optimize their energy and orient on the right problems to be solved. By releasing the potential energy bound behind updating slides and creating fleeting moments of ephemeral beauty within PowerPoint that become stale news the moment they are presented, staff are then free to focus on solving big problems as division-level staff are made more available to support subordinates. Leaders (at every echelon) become freed from the tyranny of seemingly endless administrative tasks. Achieving this would allow us to transform how we use data to drive better decisions and begin fighting off leading indicators (rather than lagging indicators driven through PowerPoint slides).

SMART Goals

From a project management perspective, the attainability of becoming a data-centric organization can only be measured by having concrete goals. The specific, measurable, achievable, relevant, and time-bound (SMART) framework was adopted to prevent staff from shooting in the dark while trying to improve.⁷ Implementing a SMART framework helped the organization focus and reevaluate goals as needed. Setting goals alone, however, does not necessarily translate to a plan for success. Our division supplemented the SMART framework with accountability, regular assessment, and the celebration of quick wins to hybridize a behavioral and systems-based approach to addressing the use of data within the organization.

Innovation Horizons

With a mandate for change established, it became necessary to enact a road map to remove barriers to progress, generate quick wins, and sustain organizational momentum. The innovation horizons shown in figure 3 formed the basis of our systematic approach to building our COP and using data to drive our organization. Contrary to Vantage, The Microsoft Teams platform is ubiquitous across the 3ID and the Army. Microsoft Teams is a graphical user interface extension of SharePoint with enhanced social features. It allows seamless integration across the entire suite of Microsoft products. With an established user base, a Microsoft Teams page hosted the division COP, and our centralized data repository (data lake) resided on SharePoint to enable easy and secure data connections and storage. We

Innovation Horizon I: Data Migration / Centralization	Innovation Horizon II: COP Restructuring	Innovation Horizon III: Predictive Model Development	Innovation Horizon IV: Share Across Army
<p>Starts: H2F Dashboard Prototype Ends: ~90 days post-LAD</p> <p>Key Tasks:</p> <ul style="list-style-type: none"> Establish COP data lake to centralize data Create common deployment pipelines Automate data ingestion Leverage Vantage APIs from system of record 	<p>Starts: COP Redesign Criteria Ends: Ongoing</p> <p>Key Tasks:</p> <ul style="list-style-type: none"> Develop CCIR to focus efforts Inform/audit battle rhythm Migrate to Power BI Premium Cap. workspaces for DIV/BDEs Organize into LOE channels Explore SharePoint COP LLT data engineering (G-6) 	<p>Starts: Consult w/ AI/ML partners Ends: Leaders at echelons use ML-drive models to drive decisions</p> <p>Key Tasks:</p> <ul style="list-style-type: none"> Improve KPIs to inform decisions Gather time-series data to support forecasting models Build models to create decision space 	<p>Starts: COP Story via PAO Ends: AORS Presentation Sep '24</p> <p>Key Tasks:</p> <ul style="list-style-type: none"> Provide utility to sub CDRs Full integration into Pangea Invite adjacent units to view Message broadly via PAO Publish COP white paper Publish in an academic journal Present at AORS 2024 (Sep '24)

AI artificial intelligence	CDRs commanders	LAD latest arrival date
AORS Army Operations Research Symposium	COP common operational picture	LLT low latency transport
APIs application programming interfaces	DIV division	LOE line of effort
BDE brigade	H2F Holistic Health and Fitness	ML machine learning
CCIR commander's critical information requirement	KPIs key performance indicators	PAO public affairs office

(Figure by Daniel R. DeNeve)

Figure 3. Innovation Horizons

initially built the COP as a series of dashboards created on Microsoft Power BI.⁸ Power BI is an application that aggregates software services, apps, and connectors to turn unrelated data sources into a coherent, visually immersive, and interactive set of insights. While labor-intensive to build, a set of scheduled refreshes can automate dashboards and deliver filterable and functional insights to the appropriate echelon. Insights delivered from Power BI can easily scale across the organization and remove the individual burden of collecting information. Implementing the Power BI platform in this manner provides a manageable approach to ensure quick wins and iterative improvements.

The first innovation horizon required migrating all data to a common platform. By establishing a data lake on SharePoint/Teams, the division now had the means to migrate data from systems of record and appropriately categorize and label its data. Although this still required some effort to pull data from systems of record, the labor cost was more than offset by the ability to automate data ingestion and create standard deployment pipelines. Staff sections became owners of their respective data sources, and data veracity began to improve over time as we became increasingly dependent on data governance and stewardship.

With the achievement of the first innovation horizon and available data for the staff, the division oriented around the second innovation horizon as our battle rhythm evolved around establishing dashboards. This naturally led to the significant curtailment of creating PowerPoint slides. Meetings were conducted using

dashboards that provided descriptive and near-real-time data. With the burden of collecting and aggregating data considerably diminished, the staff now had the means to get a near-real-time snapshot of various metrics across the division without necessarily having to wait to conduct a meeting. A new purpose for meetings resulted through an enhanced ability to see ourselves and drove the need to develop more refined commander's critical information requirements. Key performance indicators and more sophisticated metrics emerged through the visualization of overlaying previously disparate data and drilling down to key demographics across every echelon. With proper staff analysis, we began to afford decision space to our commanders.

Approximately nine months into standing up the COTR, we began to develop more historical data and analyze trends. As of the second quarter of calendar year 2024, the division was in its third innovation horizon. Descriptive data is evolving into models and projections to support decisions and provide better forecasting. While the mention of artificial intelligence and machine learning are in the popular zeitgeist, the underlying data foundations necessary to enable this capability are not. Gathering more historical data places us in a better position to integrate this nascent capability into our organization. The division is engaged in an ongoing relationship with the Army Artificial Intelligence Integration Center to leverage its expertise and implement AI strategy and large language models into our COP. As dashboards evolve and metrics inform key performance indicators, we can start to

measure what matters and alleviate the burden of collecting inconsequential data. Poorly conceived and laborious data collection will cease as staff transition from data aggregation to data analysis. Organizational energy then self-assembles toward achieving a better return on investment.

Our fourth innovation horizon is ongoing. The importance of sharing lessons learned is an essential cornerstone in managing transitions both internal to staff and external as the Army and the nature of warfare change. While the 3ID's journey could have been more efficient at the outset, we believe our process and behavioral model is malleable and replicable. It can help similar organizations generate momentum, build quick wins, and increase staff efficiency. In addition to communicating up and out, it is equally important to communicate down and in. If the work done across the division staff does not benefit subordinate units and commanders, then efforts are largely wasted. Our division COP is a valuable tool for seeing ourselves and helping our subordinates invest their organizational energy more efficiently. A data-centric division that abuses the power of its COP as a proverbial extended-reach screwdriver to micromanage four levels down creates a poor return on investment. Micromanagement diminishes trust and will all but guarantee a lack of widespread utility and the receipt of bottom-up refinement. With this idea in mind, the division commander messaged to leaders his philosophy of graceful accountability and transparent reporting to identify opportunities for the division to allocate additional resources, rather than additional pressure, to subordinates. By

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applying the COTR's spotlighting power to help subordinates, we ensure the continuation

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of a data-driven culture beyond the ephemeral reach of short-lived staff tenure.

Escape Velocity

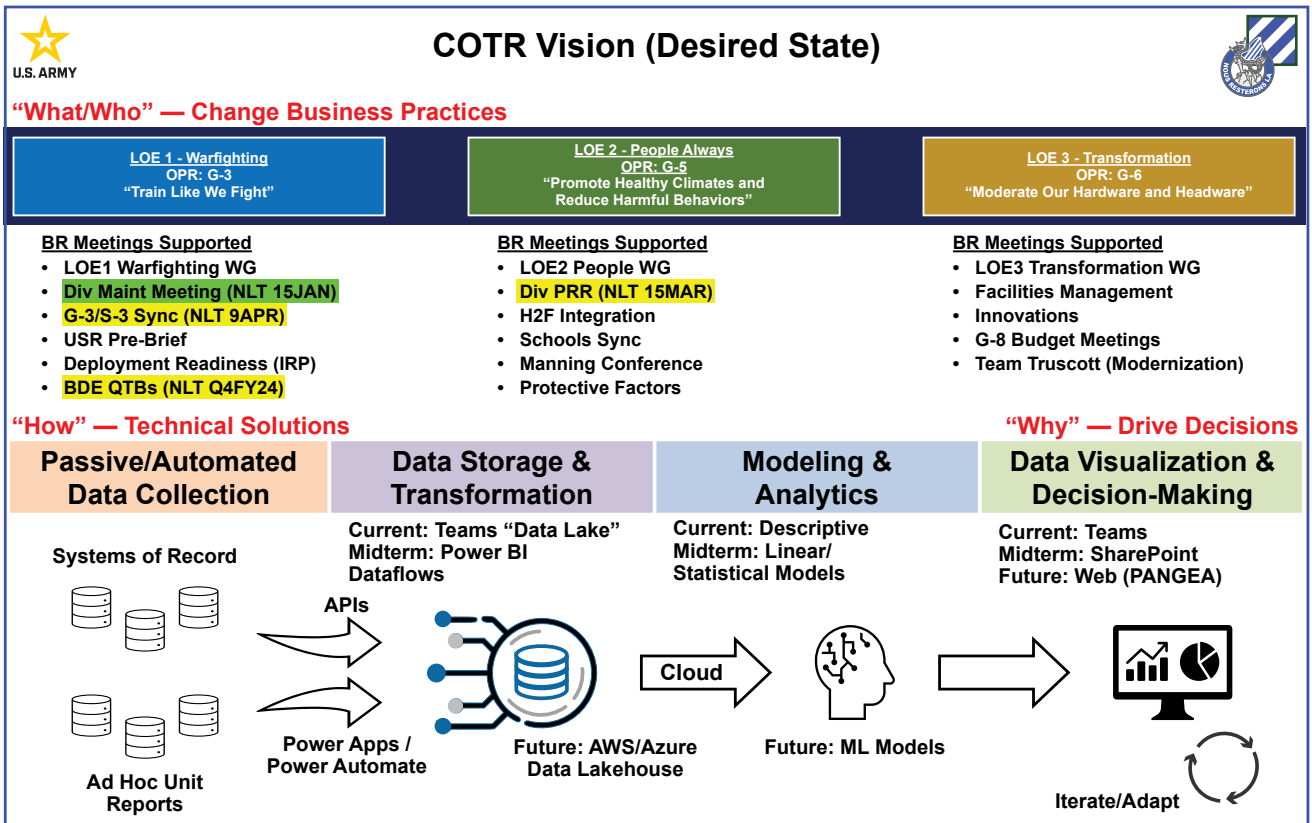
From a change management perspective, organizational momentum is the tendency of an initiative to keep moving from the current state to the desired state. To undertake an effort requiring the division to change years of arcane business practices in a radical manner, the division staff needed to generate sufficient momentum to reach a form of escape velocity that would only be possible through undeniable success. Good ideas are often nothing more than pet projects or silos of obscure technical innovation that eventually inhabit the dark recesses of an organization's SharePoint or Teams folders. To achieve an enduring change, the organization must commit to a new way of thinking and operating as a team. The COTR did not catch on until it became a whole-of-staff effort. It only became a whole-of-staff effort once it became a leadership priority. This underscores the need for executive level support to catalyze change. The collective patience of senior leaders—the division commander, division command sergeant major, deputy commanding generals, and the division chief of staff—as well as their willingness to underwrite risk were more critical to success than the day-to-day intricacies of iterative development. The COTR Vision described below in figure 4 outlines the methods undertaken to change business practices, implement technical solutions, and use data to drive decisions. By aligning our efforts with the division campaign plan's three lines of effort (warfighting, people, and transformation), we reduced barriers to implementing a data-driven COP, making it an inevitability rather than an additional duty.

The "how" in implementing our vision strategy is further nuanced when implementing a data engineering and visualization schema as a unified concept. Years of institutionalization in

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(Figure by Daniel R. DeNeve)

Figure 4. COTR Vision (Desired State)

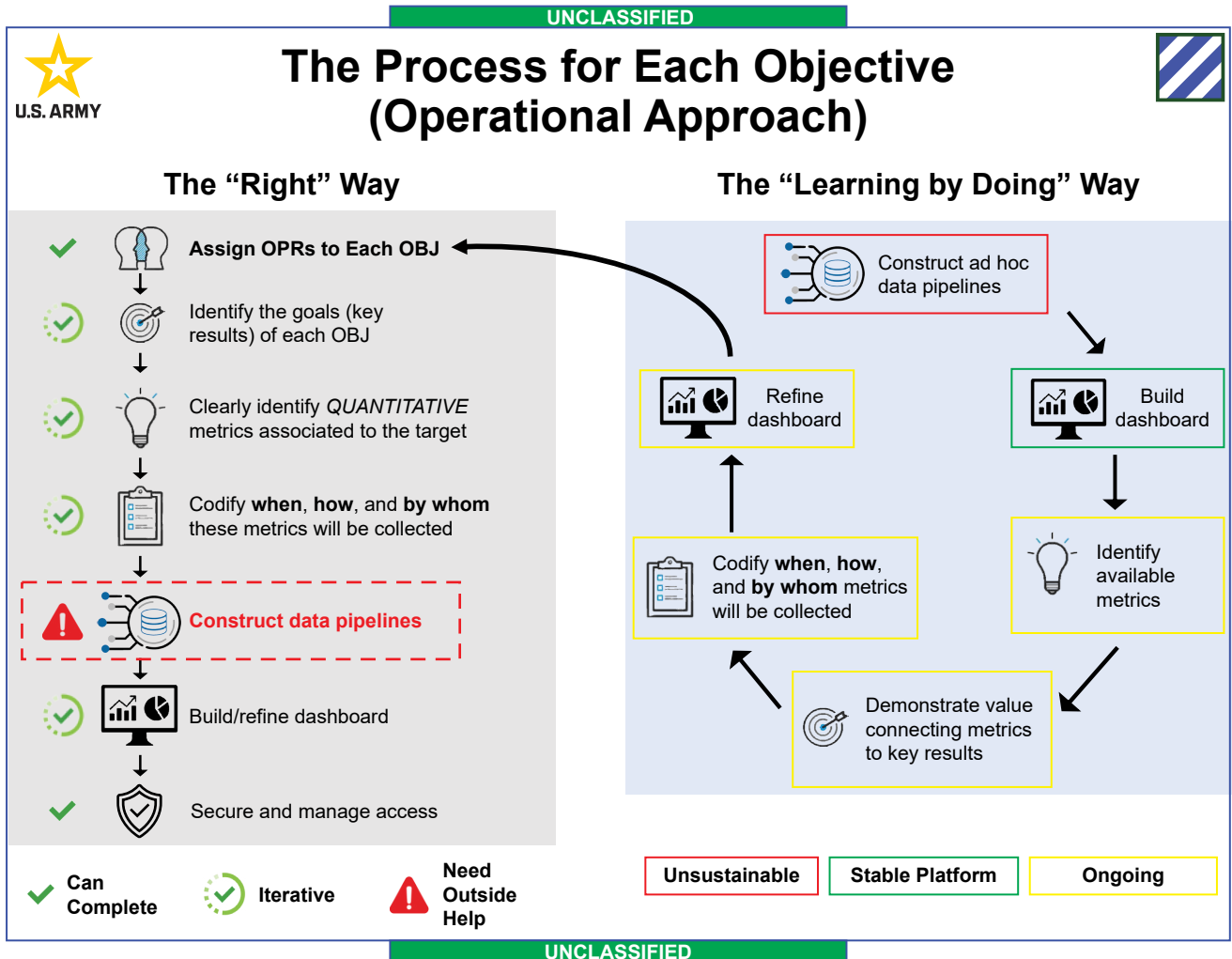
building PowerPoint and minimally viable Excel products do little to prepare staff to visualize data in a form that transcends the most basic descriptive analysis. Creating models and projections requires defining key performance indicators to inform the staff of leading indicators and the commander’s critical information requirements. Understanding that best practices from industry start with objectives and key results to inform a deliberate design framework for each dashboard and database, our division muddled through a more painful and iterative approach. To break the stalemate between theory and practice, a small, tech-savvy team built a series of dashboards without receiving feedback and design criteria from stakeholders. Mass production led to simplistic dashboards with immature metrics that staff sections were reluctant to inherit. Multiple design iterations became necessary as stakeholders began to adopt these dashboards. Dashboards became practical, actionable, and prognostic as individual staff sections took ownership of the veracity of their data and informed the creation of their models. Figure 5 outlines a

logical transformation framework on one side and the “transformation in contact” approach used by the 3ID staff to change its data practices to demonstrate value amid normal operations. While inefficient, this process allowed the staff to learn together.

The design team could have saved substantial time if they had oriented on one problem at a time and gone through a deliberate design process with relevant stakeholders. Our organization, like many Army units entrenched in outdated practices, needed exposure to viable data solutions to better understand the realm of the possible with current technologies.

Data Trust

Rather than sticking to the data, Army professionals tend to rely on their “gut feeling” or instinct when diagnosing problems. Intuition and instincts become increasingly tricky and eventually naïve as the organizations we serve expand in size and scale. Our desire to know our soldiers and be people-focused creates a blind spot in our ability to trust data at scale. This lack of trust



(Figure by Daniel R. DeNeve)

Figure 5. The Process for Each Objective (Operational Approach)

amplifies from the unnecessary complexity inherent to data management within and between Army systems of record. Leaders must rely on antiquated and marginally functional systems managed by byzantine program requirements. Depending on the crisis du jour, units apply varying and inconsistent levels of attention to ensuring data stewardship. For example, during our division’s first maintenance meeting using the COTR and pulling in near-real-time data from the global combat support system—Army and AESIP, the chief complaint among units was that the data was “all wrong.” We fell back on our tendency to lament the limitations and sophistication of our systems of record, rather than taking ownership of what we can do to maximize the veracity of our data. Over subsequent weeks, however, units accepted collective ownership and provided bottom-up

data validation, which drove discussions toward asking better questions and seeking better insights thanks to a common viewpoint of the data. By treating our data as a strategic asset rather than the ignored exhaust resulting from steady-state operations, the idea of trusting our data emerged out of necessity when it became apparent that we will never move beyond playing the blame game until we take ownership of our data.

3ID Leaders at Echelon Embracing Cultural Change and Leveraging COTR

Trusting the data and nesting within the 3ID commanding general’s intent, 3ID subordinate commanders have demonstrably embraced this cultural change and the implementation of COTR. Highlighting

the efforts of two subordinate battalions to embrace cultural change over the last twelve months, the 10th Brigade Engineer Battalion (10BEB), 1st Armored Brigade Combat Team, 3ID and Headquarters and Headquarters Battalion (HHBN), 3ID have each deliberately leveraged COTR in support of operationalizing data as a strategic asset.

Within 10BEB, battalion leadership provided a COTR introduction and orientation to battalion staff and subordinate leaders to raise awareness of its utility and to direct integration of COTR into the battalion's systems and processes. For this battalion, COTR has served to generate shared understanding and facilitate faster, better-informed decisions by leaders. Although not yet replacing battle rhythm meetings such as command and staff, training meeting, and maintenance meeting, COTR has supported leaders with direct, immediate visibility of information without the need for access or log-in to a specific system of record. In terms of human resources metrics, all 10BEB leaders have shared understanding of current data for evaluations, flags, and awards without needing delegate or human resources professional access to the evaluation entry system or the integrated personal and pay system. Additionally, all 10BEB leaders have access to current medical readiness information (non-HIPAA) without needing to generate these sanitized rosters from the medical protection system. In terms of training readiness, all 10BEB leaders can view current weapons qualification breakdowns, by type of weapon system, without requiring generating new reports from the digital training management system. For upcoming schools, 10BEB leaders have shared understanding of upcoming school slots with by-name lists and report dates. In terms of maintenance, all 10BEB leaders—even those without direct access to the global combat support system-Army—have access to current combat slant, with available filters for viewing the status and percentages of pacing items by type. Additionally, 10BEB leaders have the ability to leverage filters within COTR to identify long-lead-time parts that may require requests to expedite receipt. COTR also provides 10BEB leaders with the ability to view equipment services by category (e.g., tracked vehicles, wheeled vehicles, weapons) through time, down to the individual company level. Additionally, COTR provides these leaders with a graphical depiction of planned services

for the next 365 days, assisting them with identifying unintended spikes in numbers of services in a given time period—and informing a commander's decision to reschedule services to avoid services becoming overdue. For 10BEB leadership, COTR has already provided significant value, and the way forward is reducing staff burden through use of COTR to replace some or all product development for battle rhythm meetings.

Within HHBN, 3ID, battalion leadership has achieved implementation of COTR into battle rhythm meetings and—fully embracing the cultural change—establishment of its own nested battalion COP (Power BI platform). For this battalion, COTR has served to generate shared understanding, facilitate faster, better-informed decisions by leaders, and also reduce staff burden on administrative tasks. During the battalion's command and staff meeting, leaders view human resources metrics directly from COTR. During the battalion's training meeting, leaders view physical training, weapon qualification, and even travel requirements (e.g., unsubmitted vouchers, government travel card delinquencies) from COTR. By establishing its own nested battalion COP within the style and digital architecture of COTR, HHBN, 3ID, has further operationalized data as a strategic asset by “owning” the capability for automated data-centric tools to generate shared understanding and facilitate decision-making specific to the battalion's needs. Employing its battalion COP, all leaders within HHBN, 3ID, have access to current Army Regulation 350-1 compliance data, by specific training requirement, with filters down to section or squad level, along with by-name lists without the need to generate new reports from the digital training management system. Similarly, all leaders within HHBN, 3ID, have access to current military driver's license qualifications, by specific vehicle, with filters down to section or squad level, along with by-name lists without the need for direct access to the global combat support system-Army. For HHBN, 3ID leadership, COTR and its newly established battalion COP have meaningfully improved shared understanding, facilitated faster, better-informed decision-making, and reduced staff burden on administrative tasks. Building upon its already aggressive implementation of the data-centric culture, HHBN, 3ID leadership is currently pursuing a shift to fully automating its battle rhythm meetings



through the framework now proven with COTR automation of the 3ID maintenance meeting.

Lessons Learned

Consultations with other organizations across Army Forces Command, Army Futures Command, the commercial enterprise, and DOD contractors have informed our understanding of the myriad resources available to become a more data-centric organization. Many organizations are better equipped to guide the Army and DOD through the information age and influence policy change over the next decade. In the interim, the 3ID is determined to succeed through its unbowed resolve to explore the possibilities and get results in a resource-constrained environment. While a literature review and study of the best practices of successful organizations will provide insight into data management practices, study alone cannot provide an accurate road map to transforming an organization and creating a data-driven culture.⁹ Organizational, circumstantial, and personal idiosyncrasies guarantee that initial efforts will be met with failure. Rather than admiring the problem and overengineering a solution to achieve greatness, it is satisfactory to take

Sgt. 1st. Class Charles Howe, a chemical, biological, radiological, and nuclear (CBRN) operations noncommissioned officer assigned to 3rd Infantry Division, looks for simulated potential CBRN threats during a Warfighter exercise on 15 November 2022 at Fort Stewart, Georgia. (Photo by Spc. Duke Edwards, U.S. Army)

immediate action to be good enough and iterate upon small improvements.

The division leadership's emphasis on transformation and leader education, while explicitly underwriting risks in noncritical unit requirements, has led to a climate of learning and innovation. Empowering and trusting the staff, especially our warrant officer corps, to develop new methods to extract, aggregate, and visualize data has naturally provided an impetus for self-development and increased interest in acquiring new skills across the division. The Army's greatest asset is its people. If we outsource our ability to innovate and drive organizational change to external enablers, we diminish our organic capability and inhibit the development of our homegrown intellectual capital. Expecting our leaders to develop a scientific acumen is likely far-fetched but perhaps achieving a

level of data literacy analogous to becoming a bro-scientist is good enough. A bro-scientist has more agility to experiment than a real scientist and can proselytize what he knows and how to do things while maintaining the tactical advantage of organizational immersion and iterative improvement. Greatness emerges through consistent practice and the organization's ability to stay the course through uncomfortable growth. Army professionals must match their ability to learn with a willingness to unlearn previously held assumptions and behavioral norms.

The 3ID has not “mastered” its use of data, but we have made noteworthy improvements over the past

year from mid-2023. Our division COP, the “COP of the Rock,” leverages creative uses of existing resources (Microsoft Teams, SharePoint, Power BI, Vantage, and Power Apps) and presents a replicable proof of concept for how a division can navigate a path to more transparent, accessible, and understandable data to drive operations. Under the command of Maj. Gen. Christopher Norrie, the 3ID will stay the course and continue to improve existing dashboards within the COTR to support operations. We will continue to share resources and lessons learned with the broader enterprise and encourage others to replicate and build upon our success to help foster a more data-enabled Army. ■

Notes

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