



Recommendations for the Next Generation of Business Health Metrics

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An independent report to identify best-practice enterprise performance metrics to inform decision-making and maximize the effectiveness of business operations.



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Executive Summary

Tasking: On August 3, 2022, the Deputy Secretary of Defense tasked the Defense Business Board (the “Board”), through its Business Transformation Advisory Subcommittee (the “Subcommittee”), with preparing an independent report that summarizes the metrics private industry executives generally utilize to inform their decision-making and optimize their businesses’ performance (the “Report” or the “Study”). The Terms of Reference (the “TOR”) of the Study specifically identified eleven areas of focus for which relevant private sector business metrics were requested. In this Report, the Board summarized the most prevalent metrics used in the private sector for the eleven specific areas of focus. While the Department of Defense (the “DOD” or “the Department”) is unique, and not every area of focus in this Report has a direct corollary in the private sector, the Board leveraged its vast network in both the private and public sectors to develop the list of metrics proposed herein.

- | | | |
|---------------------------------------|------------------------|---------------------|
| ➤ Policy | ➤ Financial Management | ➤ Logistics |
| ➤ Acquisition & Contracting | ➤ Human Resources | ➤ Resource Planning |
| ➤ Digital Modernization & IT | ➤ Health (Medical) | ➤ Security |
| ➤ Energy, Installation, & Environment | ➤ Innovation | |

Figure 1. Business Health Metrics Functional Areas

Approach and Methodology: The Subcommittee conducted twelve (12) weeks of Study analyzing and synthesizing data from more than 65 organizations and individuals across the public and private sectors. Interviews were conducted to better understand the DOD mission, to evaluate private indicators for applicability, and to validate perspectives. Questionnaires were prepared and responses were analyzed from 12 Defense Agencies and Field Activities (“DAFAs”) and all three military departments (the “Military Departments”) (collectively the “Components”). A literature review was also undertaken to validate assumptions and included more than 85 publications, policies, plans, prior studies, videos, webinars, and other literary items. The Subcommittee reviewed and considered over 600 metrics.

Background: As an organization with 2.9 million employees operating 24/7/365 around the globe and with an annual budget of \$753 billion, the DOD has access to vast amounts of data. At present, the DOD has a promising data analytics program used by the Secretary and Deputy Secretary of Defense to calibrate their perspective of the DOD business enterprise. The opportunity that the DOD has, per the TOR for this Study, is to improve the presentation of that data in a manner that will better enable DOD leadership to measure the DOD’s performance against the business functions that support its mission: to provide combat-capable military forces needed to deter war and to protect the security of our nation.



Harnessing the power of data was a centerpiece of Deputy Secretary Hicks' May 2021 memo, "Creating Data Advantage," which directed multiple actions to accelerate the DOD's enterprise data capabilities, including¹ designating Advancing Analytics ("ADVANA") as:

- The single enterprise authoritative data management and analytics platform for the Secretary of Defense, Deputy Secretary, and Principal Staff Assistants and
- The platform of choice for metrics and visualizations used within the Deputy's Management Action Group ("DMAG") and Deputy's Workforce Council ("DWC").

In addition to mandating OSD use and Component support of ADVANA, the memo also provides a framework for Component organizations to keep their current management and analytics systems in place. As long as they adhere to the CDO's open data standard architecture rules to ensure sharing, Component-unique systems can maintain their place in the DOD data ecosystem. Components must also coordinate with OSD on metrics and visualization regarding strategic priorities, business health, and operations of the Department.²

The capabilities demonstrated over the past eighteen months through ADVANA have been transformative. Analysis that previous took days to conduct now takes mere minutes. The quality and reliability of the underlying data is materially better than that used by the DOD prior to the ADVANA designations. ADVANA leverages information from over 400 data sources across the DOD and plans to ingest 2,100 more.³

While the new ADVANA initiative is a positive step towards achieving more integrated and consistent data, timeliness and reliability remain an issue. With the continued focus on the importance of data and metrics by the Deputy Secretary, significant opportunity exists for ADVANA to:

- Provide the Secretary, Deputy, and Senior DOD leaders with the dashboard/data they need to make decisions via the Business Health Metrics;
- Increase the use of data-driven performance measures within the Department's Annual Performance Plan ("APP") and Annual Performance Report ("APR"), the annual reports that set out and gauge the Department's progress toward the initiatives in the Strategic Management Plan ("SMP");
- Enable continuity and accountability by increasing the use of "core" metrics, insulated from the perturbation of administrative turnover;
- Foster greater alignment in a heavily federated enterprise by standardizing metrics across components -- agencies may differ in their execution but can be measured alike; and

¹ Hicks, Kathleen H. (2021, May 5). *Creating Data Advantage*. [Memorandum]. Department of Defense. <https://media.defense.gov>

² Ibid

³ Defense Business Board, (2022, May 12). Executive Analytics in DOD & a Review of Private Sector Best Practices. (Report No. DBB FY 22-02). <https://dbb.defense.gov/>



- Bring focus to key areas of performance improvement using metrics designed to highlight gaps and drive performance to targeted outcomes.

Conclusion: The goal of this Study is to provide a set of business health metrics that DOD leadership can consider as it further develops metrics that are best suited to measure the DOD’s performance relative to its mission. The metrics included in this Report represent those that are consistently utilized by leaders in the public and private sectors to assess an organization’s performance. The proposed metrics are primarily based on private sector best practices, but not exclusively. Some recognize the unique nature of the DOD for issues that do not exist in the private sector (e.g., readiness).

The DBB and its Subcommittee recommend the Deputy Secretary empower an independent senior individual to review each recommended metric with the appropriate subject matter experts for consideration and implementation. **Importantly, the recommended metrics are focused on what the DOD should have, rather than what it may have now.** If the DOD does not currently have the data available to provide the recommended metrics, it should develop a prioritized approach to gathering the unavailable data.

Business health metrics should be regularly reviewed in a periodic decision-making forum, which will enable leaders to make more timely and informed risk-based decisions. See pages 22-36 for a complete list and breakdown of such metrics, aligned with the areas of focus from the TOR.

This Report also includes recommendations on the lagging and leading private sector metrics that would benefit Department leaders. Finally, this Report also includes recommendations on how best to utilize metrics to change behavior at the business unit and executive levels. The DOD should integrate the holistic set of recommendations in this Report to achieve sustainable success.

Recommendations Summary: The table below summarizes the DBB’s recommendations detailed within this report. A step-by-step implementation “road map” is included in Appendix I.

No.	Short Title	Recommendation	Page(s)	TOR Reference
1	Governance	The DOD should ensure the governance body for business health metrics includes representatives outside of the group responsible for determining and delivering on such metrics.	14	Using metrics to change behavior
2	Transformational Leadership	The Secretary / Deputy Secretary should consider creating a separate and independent Performance Improvement Officer.	14	Using metrics to change behavior
3	Resourcing	The DOD should develop a resourcing model that enables it to assess the performance of the Components as well as the Enterprise.	15	Using metrics to change behavior
4	Reporting Culture	DOD Senior Leadership must publicly and consistently celebrate those who report the status of projects objectively and fairly.	15	Using metrics to change behavior
5	Decision-making	DOD leaders should insist that all meetings use live electronic data from approved data pools, with decisions made based on this data.	15	Using metrics to change behavior
6	Standardizing Data & Codifying Requirements	Once it has identified the metrics of the future, the DOD should publish updates to their functional instructions to formalize data requirements in DOD instruction.	16	Using metrics to change behavior



7	Change Management Study	The Deputy Secretary should direct the DBB to conduct a study on how to improve the business culture of the Department.	15	Using metrics to change behavior
8	Metrics	The Deputy Secretary should empower an independent individual to review each recommended metric with the appropriate subject matter experts for consideration and implementation. Select no more than 30 for the Chief Executive / Chief Operating Officer's dashboard.	22-38	Best Practice Metrics
9	Data	The individual appointed by the Deputy Secretary to select metrics from this report should not reject proposed indicators simply due to lack of data. If the DOD does not currently have the data available to provide the recommended metrics, it should take steps to fill the related gaps.	5	Best Practice Metrics
10	Leading & Lagging Indicators	The individual appointed by the Deputy Secretary to select metrics should consider adopting leading and lagging indicators to properly measure the DOD's business functional areas.	38-40	Leading & Lagging Indicators

Table 1 - Recommendations Summary

Final Comments: The DBB appreciates the confidence shown by the Deputy Secretary of Defense in entrusting the Board with this important Study. In addition, the Subcommittee sincerely applauds the hardworking people of the DOD who tirelessly generate, curate, and manage its data. Their efforts enable a true strategic advantage for the United States of America, and it is our hope this report is useful in that endeavor.

The full DBB approved the observations and recommendations contained within on November 10, 2022.

Respectfully submitted,

A handwritten signature in blue ink that reads "Erin Hill".

Erin Hill
Subcommittee Chair



Preface

This Study, DBB FY23-01, Business Health Metrics, is a product of the DBB. Recommendations provided herein by the DBB are offered as advice to the DOD and do not represent DOD policy.

The DBB was established by the Secretary of Defense in 2002 to provide the Secretary and Deputy Secretary of Defense with independent advice and recommendations on how “best business practices” from the private sector’s perspective might be applied to the overall management of the DOD. The DBB’s members, appointed by the Secretary of Defense, are senior corporate leaders with demonstrated executive-level management and governance expertise.

DBB members possess a proven record of sound judgment in leading or governing large, complex organizations and are experienced in creating reliable and actionable solutions to complex management issues guided by proven best business practices. All DBB members volunteer their time to this mission.

Authorized by the Federal Advisory Committee Act of 1972 (5 U.S.C., Appendix, as amended), and governed by the Government in the Sunshine Act of 1976 (5 U.S.C. § 552b, as amended), 41 CFR 102-3.140, and other appropriate federal and DOD regulations, the DBB is a federal advisory committee whose members volunteer their time to examine issues and to develop recommendations and effective solutions, aimed at improving DOD management and business processes.

The management of this Study was governed by the Federal Advisory Committee Act of 1972 (5 United States Code (USC), Appendix, as amended), the Government in the Sunshine Act of 1976 (5 USC § 552b, as amended), 41 CFR 102-3.140, and other appropriate federal and DOD regulations.



Section I

The DOD's First-Generation Metrics Program

The DOD has made significant progress sourcing and cataloging enterprise-wide data and identifying business health metrics.

As of October 2022, DOD has:

- Support and engagement from senior department leadership;
- An analytics application to co-locate and visualize its data (“ADVANA”);
- Over 400 of its 2,500 data systems integrated in ADVANA, the “single source of truth;”
- An initial set of nearly 300 business health metrics; and
- An executive level dashboard that provides aggregated performance metrics.

This “first generation” metrics program enables the Department to leverage near-real-time data at its most senior governance meeting, the Deputy’s Management Action Group (“DMAG”).

In addition to these metrics, the Department, through the Performance Improvement Officer (“PIO”), develops and publishes a Strategic Management Plan. This plan translates Secretary of Defense (“SD”) and Deputy Secretary of Defense (“DSD”) priorities into business objectives that align with the National Defense Strategy (“NDS”).

While these activities are encouraging, there is recognition within the Department that there is still more work to do. As noted in the TOR, the Deputy Secretary acknowledged that, “We must continually evaluate industry best practices to determine: (a) if the right data is being collected; (b) if DOD has the right metrics to drive desired outcomes; and (c) how these metrics turn into actionable information used to improve the DOD.”⁴ In response, the Deputy Secretary initiated an internal and external review of metrics. Specifically, the Deputy Secretary designated a small internal team to evaluate the existing set of business health and strategic management plan metrics (the “internal review”). For the external review, the Deputy Secretary tasked the DBB, as indicated in the TOR, to offer recommendations on:

- A comprehensive list of metrics that are widely utilized by the private and/or public sectors across several specific dimensions;
- Lagging and leading indicators that would benefit Department leaders; and
- How best to utilize metrics to change behavior at the business unit and executive levels.

The Deputy Secretary will triangulate the results of the internal and external reviews to develop the next generation of Business Health Metrics.

⁴ Hicks, Kathleen H. (2022, August 3). *Business Health Metrics Terms of Reference*. [Memorandum] Department of Defense. <https://dbb.defense.gov/>



DBB Approach: The Subcommittee’s objective was to provide the most widely utilized private and/or public sector metrics for each of the eleven functional business areas, regardless of whether or not they currently exist at DOD. The DBB acknowledges that not all private sector metrics are relevant for the DOD.

Section II

Why the DOD Needs Metrics

The main purpose of a metric is to help communicate the progress an organization is making toward a goal or strategy. Given the complexity of the DOD, a core set of metrics is vital.

DOD Is Large and Global: With 2.91 million employees, 4,800 sites operating in 170 countries, and an annual budget of approximately \$753 billion, the DOD is one of the world’s largest organizations.⁵ The scope and scale of the DOD makes managing business operations at the enterprise level a massive undertaking. The DOD’s stated mission is to provide combat-capable military forces needed to deter war and to protect the security of our nation.⁶ To accomplish this mission, the DOD operates 24/7/365 and must always be ready to act on information in a timely and effective manner.

DOD Is Federated: Business operations in DOD are managed using a federated approach (under Title 10) in which the Military Departments, the Defense Agencies and Field Activities, and the organizations under OSD each perform their own governance and oversight. Statute provides that OSD will make policy, provide advice, and supervise the Defense Department. However, the federated model limits OSD’s ability to analyze business operations from an enterprise perspective.

Metrics Can Help Measure Progress Against Strategy: The NDS outlines how the DOD will deter war and protect the interests of the United States.⁷ The consistent and successful execution of the DOD’s operational activities is essential to the success of the mission. Therefore, like military



DoD by the numbers

PERSONNEL:

2.91M

Inclusive of active duty, reserve, guard, and DoD appropriated fund civilian personnel

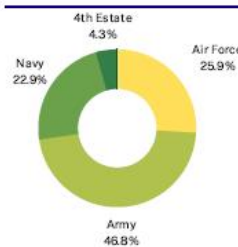
BUDGET:

\$752.9B



170

Countries host facilities that support DoD personnel across **4,800** sites



PERSONNEL BREAKDOWN

Includes the Active, Reserve, Guard, and Civilian workforce across the 3 military departments and 4th Estate

REFERENCES

Defense Manpower Data Center: (<https://dwp.dmdc.osd.mil/dwp/app/main>)
U.S. DOD Website: <https://www.defense.gov/about>

⁵ Department of Defense. About. Retrieved on October 20, 2022. <https://www.defense.gov/About/>
⁶ Department of Defense. *Mission Statement*. Retrieved October 20, 2022. <https://www.defense.gov/about/#:~:text=We%20Are%20Your%20Defense,and%20ensure%20our%20nation's%20security.>
⁷ Department of Defense. (2022, October 27) *2022 National Defense Strategy of the United States of America*. <https://media.defense.gov/2022/Oct/27/2003103845/-1/-1/1/2022-NATIONAL-DEFENSE-STRATEGY-NPR-MDR.PDF>



operations, business operations must be measured through objectives and goals to ensure success.

The most effective business health metrics will enable the DOD to answer the question as to whether its business activities support the NDS. The NDS is issued every four years, in accordance with U.S. Code § 113, and describes, among other things:

- The priority missions of the DOD and assumed force planning scenarios;
- The assumed strategic environment, including the most critical and enduring threats to the national security of the United States and its allies;
- A strategic framework that guides how the DOD will prioritize among the threats;
- The roles and missions of the armed forces;
- The force size and shape, infrastructure, force posture, force readiness, personnel, organization, defense capabilities, technological innovation, and other elements necessary to support such strategy;
- The major investments in defense capabilities, force structure, force readiness, force posture, and technological innovation that the Department will make;
- How the Department will prioritize and integrate activities relating to sustainment of major defense acquisition programs, core logistics capabilities, commercial logistics capabilities, and the national technology and industrial base;
- How the Department will specifically address contested logistics;
- Strategic goals to address or mitigate the current and projected risks to military installation resilience; and
- Strategic goals related to diversity and inclusion in the armed forces, and an assessment of measures of performance related to the efforts of the armed forces, to reflect the diverse population of the United States eligible to serve in the armed forces.

2022 NDS Priorities

- 1. Defending the homeland, paced to the growing multi-domain threat posed by the (People's Republic of China ("PRC"));***
- 2. Deterring strategic attacks against the United States, allies, and partners;***
- 3. Deterring aggression, while being prepared to prevail in conflict when necessary, prioritizing the PRC challenge in the Indo-Pacific, then the Russia challenge in Europe; and***
- 4. Building a resilient Joint Force and defense ecosystem.***

Additionally, the SMP, required by the Government Performance and Results Modernization Act of 2010 ("GPRAMA"), articulates the Secretary of Defense's strategic priorities in terms of business/management objectives and performance measures. The Annual Performance Plan and Annual Performance Report, contained within the most recent SMP, provide a business "report card" with the APP defining specific performance goals for the upcoming year and the APR consolidating prior year performance results across the enterprise. Together, they ensure the SMP "is aligned to and establishes



accountability to measure progress in realizing [the] National Defense Strategy.”⁸ Metrics, therefore, hold significant potential to aid in measuring performance within the SMP and of the business elements within the NDS at large.

Section III

How to Mature the Next Generation of DOD Enterprise Metrics

While the DOD has made progress, the next generation of business health metrics must improve. There are still hurdles to overcome to accomplish the vision.

Increase Outcome-based Metrics: The most recent SMP, published in August 2022, provides ninety-seven (97) performance measures against four strategic goals that support both the Secretary of Defense’s priorities and the larger strategic objectives identified in the NDS.

Although metric-heavy, the SMP lacks the objective indicators needed to sufficiently measure progress in many important areas. For instance, just under two-thirds of the measures are quantifiable with data, if such data exists. The remaining one-third measure activities rather than outcomes (like the completion of a guidance document, the creation of a working group, the development of a metric, or the completion of program reviews).

However, there is good news. The Subcommittee understands that an effort is underway within the DOD to refine the performance measures of the SMP, in concert with the functional leads within the Offices of the Under Secretaries and Military Departments, to better articulate the status of SD/DSD strategic priorities. The objective is to identify outcome-based goals that measure progress against key strategic objectives with meaningful metrics fueled by data. The effort, backed by senior department leaders and tracked at its most senior governance body, will co-locate new outcome based SMP performance measures with Business Health Metrics in ADVANA, which will materially improve the ability to assess performance consistently and objectively.

The benefit of increasing outcome-based metrics within the DOD is broader than improving the usefulness of the SMP. Results oriented measures can help in making meaningful decisions within personnel rating systems as well. Metrics are a useful tool in setting expectations and making merit-based evaluations. In this way, they are critical to cultural transformation and accountability.

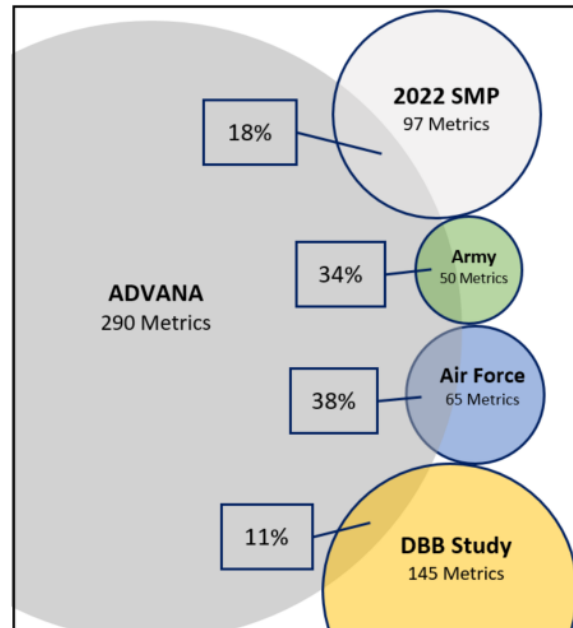
Improve Standardization: While there is an abundance of data within the DOD, the data is largely decentralized, as evidenced by the existence of over 2,500 disparate data systems. These systems track everything from personnel training completion rates to aircraft availability. However, the underlying systems are not strategically aligned, and nomenclature varies. As a result, the ability to compile a DOD-wide perspective is limited and, even then, is highly manual and inefficient. Performance measures tell a similar

⁸ Department of Defense. (2022, August 8). *Department of Defense Strategic Management Plan*. <https://dam.defense.gov>



story. If the metrics in ADVANA today are any indicator, less than 20 of the SMP performance measures correlate to business health metrics currently.

Standardization across executive metrics breaks down even further at the Component level. While some functional communities mandate common reporting across Component organizational boundaries, others delegate authority to Component leaders to pick the metrics that suit their business needs and unique mission set. Some do both. A cultural aversion to sharing data among Components contributes to the lack of standardization. “There has been no standardization within the Department on how we store data—paper format, not in the right database, held on a SharePoint—we are doing manual data calls right now to figure out the who, what, where, when, why,” one OSD leader shared with us.



Metrics variability across the enterprise - The illustration above depicts the relative commonality between executive metrics in the Air Force, Army, the SMP, and this Study against those in ADVANA. Data from the Air Force & Army was collected via RFI in Sept. 2022. The numbers are total enterprise metric quantities. Percentages describe the commonality. While the size of the circles is proportional with respect to quantity of metrics against the other groups, the amount of overlap to show commonality is not to scale. Also, the illustration only shows the relationship between each group and the ADVANA metrics population, not against each other. There was commonality among all populations, but to a lesser degree than each population to ADVANA. The point, is that 1) Standardization of executive metrics is low and 2) Supplementing ADVANA metrics with those from this study may improve breadth & capture a more complete picture of enterprise business health.

A Request for Information (“RFI”) sent to 16 Defense Agencies/Field Activities and all three Military Departments to support this Report included, “What are the top metrics your senior service or agency leaders use to determine the health [of various business areas]?” Unfortunately, **only four respondents currently use one or more ADVANA metrics to measure their business health.** This response underscores the difficulty of measuring the enterprise objectively and consistently.

Deputy Secretary Hicks appreciated the value and potential of DOD’s data when she authored “Creating Data Advantage,” and directed that the Department take multiple actions to standardize both data and metrics to accelerate the DOD’s enterprise data edge.⁹ These include:

- Coordinating with the Executive Analytics Cell [ADVANA] to develop appropriate metrics, visualizations, and insights...;¹⁰
- Publishing data assets in the DOD federated data catalog along with common interface specifications;¹¹

⁹ Hicks, Kathleen H. (2021, May 5). *Creating Data Advantage*. [Memorandum]. Department of Defense. <https://media.defense.gov>.

¹⁰ *ibid*

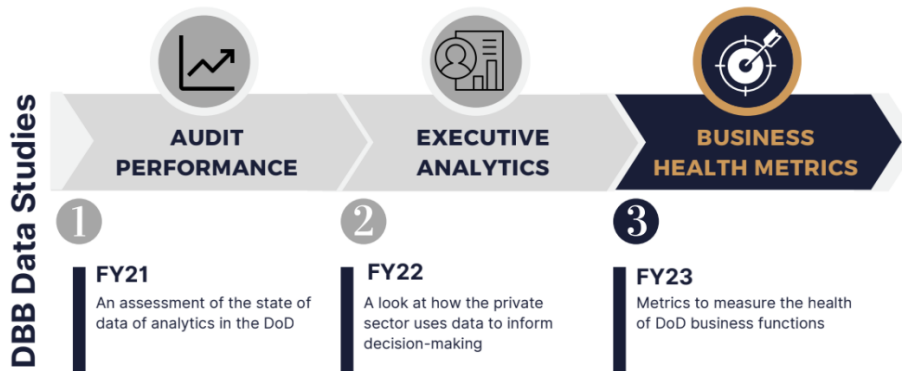
¹¹ *ibid*



- Storing data in a manner that is platform- and environment-agnostic, uncoupled from hardware or software dependencies; and¹²
- Barring use of other data management and analytics platforms without approval by the DOD Chief Data Officer (“CDO”) [CDAO] and Component CDO.¹³

Although not an express mandate to exclusively leverage ADVANA, the memo requires the Components to support the use of ADVANA and to share their data. Over time, through these principles and other initiatives of the CDAO to integrate more data systems into ADVANA, the quality and usefulness of the data will improve.

Continue to Shift the Culture: One senior leader celebrated that DOD presentations have become more data-driven and analytically focused than ever before. This represents a positive culture shift, which must be consistently reinforced. If this behavior is not exhibited, the following observation from one senior DOD official will remain a reality and the initiative will fail, “We are still postured to support a world of 50-slide PowerPoint presentations for which all the principals have had detailed preps with itemized talking points—a stark contrast to the real-time data model we endeavor to adopt.”



Apply the Fundamental Principles of Prior DBB Data Studies: This Study builds upon DBB reports issued over the past several years, including “Audit/Performance Data Use in Private Industry” (the “Audit Performance Study”¹⁴) and “Executive Analytics in DOD & A Review of Private Sector Best Practices” (the “Executive Analytics Study”¹⁵). The Audit Performance Study compared data management and analytics practices across the DOD with leading practices from the private sector. The Executive Analytics Study focused on how C-suite and business unit-head-level leaders leverage data to inform decision-making.

Several recommendations from those studies continue to be relevant and will affect the success of the next generation of business health metrics.

- **Rigorous Change Management:** A disciplined change management program is necessary to move an organization from a current to desired state. Interviews with private sector executives conducted as part of the Executive Analytics Study

¹² ibid

¹³ ibid

¹⁴ Defense Business Board, (2020, Nov 16). *Audit/Performance Data Use in Private Industry*. (Report No. DBB FY 20-02). <https://dbb.defense.gov/>

¹⁵ Defense Business Board, (2022, May 12). *Executive Analytics in DoD & a Review of Private Sector Best Practices*. (Report No. DBB FY 22-02). <https://dbb.defense.gov/>



coalesced around a common set of principles. These principles ensure proper resource allocation, reinforce the urgent need for change, gather buy-in from all levels of the organization, manage the implementation of change, and engage in active and ongoing communication efforts from the top and throughout the organization. Interviewees said that change management principles were used at both the enterprise and business unit level to ensure success.¹⁶

- **Business Health Metric Governance:** An objective governance process is necessary to establish the initial business health metrics, as well as the criteria for rating a metric as red, amber, or green. In addition, any changes to any metrics, or to the rating criteria of any such metrics, should also require the same governance and transparency. A proper governance structure would include representatives outside of the group responsible for determining and delivering on such metrics in addition to customers and stakeholders. This governance structure will mitigate the inherent conflict of interest that occurs when one determines metrics and reports status on their own project.
 - **Core Metrics:** A portion of all functional metric families should be fundamental to the business processes and remain constant over time, regardless of administration changes.
 - **Initiative-based Metrics:** Some metrics will evolve over time based on changes to strategy or priority. Metrics must also be developed to measure progress against short-term leadership initiatives.
- **Transformational Leadership:** The DOD needs a full-time senior executive focused solely on business transformation. Like most large organizations, the ingrained culture of the Department is resistant to change. It typically takes 5-7 years for a major change management initiative in the private sector to be successful and sustainable. Therefore, the Department needs consistent top-level leadership both within and between administrations to drive needed transformational changes in an uninterrupted fashion.

The current PIO is also the Director of Administration & Management and charged with managing all aspects of the Pentagon, among other duties. The current Director of Administration/PIO is also a political appointee and the average tenure of such appointees in the Pentagon is 18-24 months. As a result, many political appointees are understandably focused primarily on short-term goals that can be accomplished during their tenure. This leadership “churn” makes achieving longer-term transformation goals very difficult.

As a result, the DBB recommends that the Secretary / Deputy Secretary consider creating a separate and independent PIO, which would report directly to the Deputy Secretary, similar to the Ministries of Defense of both the UK and Australia. Ideally, this should be a Level III PAS¹⁷ position in order to maximize the chance of attracting a top-quality candidate and to help ensure the effectiveness of the position. Alternatively, it could be an exempt civil servant at

¹⁶ Defense Business Board, (2022, May 12). *Executive Analytics in DoD & a Review of Private Sector Best Practices*. (Report No. DBB FY 22-02). <https://dbb.defense.gov/>

¹⁷ Presidentially Appointed, needing Senate confirmation



the highest level of the Senior Executive Service. In either event, the person should have significant transformation and change management experience and receive a five-year term appointment with a performance-based contract. The person should be eligible for re-appointment if their performance merits such an action.

Having an independent, exempt, and term-appointment PIO would enable the Department to focus on longer-term transformation goals and keep focus through multiple administrations. In previous DBB studies, private industry interviews identified that the best person for this type of job was someone toward the end of their career who has significant executive experience and can afford to make difficult decisions to implement long-term goals without worry about their future employment.

- **Resourcing:** Given the scope and scale of the DOD, managing business operations at the enterprise level is a massive undertaking. However, the DOD is not sufficiently staffed to provide effective enterprise oversight (in the same manner as private industry), largely due to reductions in Headquarters Activities staffing over the past five years. The DBB recommends that the DOD adopt an enterprise perspective and develop a resourcing model that enables the DOD to assess the performance of the Components as well as the enterprise.
- **Reporting Culture:** The success of any activity requires the owner to confidently share the status of a project and the issues or challenges associated with executing the task. However, if the culture of an organization is one that penalizes the owner for reporting a red or amber status, then project owners are likely to avoid reporting such status, perhaps until it's too late to take action. In fact, one DOD organization indicated that, "the stigma around "red metrics" led to units "keeping things green" until they absolutely had to disclose issues." The DOD RFI indicates that the anxiety around poor performance data has led to unintended consequences. Over half of the Components that responded said that perceptions around poor performance resulted in a negative stigma and contributed to, what one organization described as, "the unnecessarily risk adverse DOD."

DOD Senior Leadership must publicly and consistently celebrate those who report the status of projects objectively and fairly. By celebrating such individuals, and helping them develop a path to green, the individuals will feel supported rather than abandoned and, therefore, will be more likely to report project status objectively. Additionally, the DBB recommends a follow-on study on how to improve the business culture of the Department to break down barriers, to evaluate risk from a business perspective for business operations, and to look at operations from both a service and enterprise perspective.

- **Decision-making:** DOD Senior Leadership should model the behavior expected of the entire organization. Leaders should insist that all meetings use live electronic data from approved data pools, with decisions made based on this data. When senior management makes real-time decisions based on validated data generated directly from ADVANA, the culture will change.



- **Standardizing Data and Codifying Requirements:** We heard from at least one senior DOD official that the Government will not take action without written authority, especially if that means delivering data that does not exist today. Therefore, key indicators and associated data should be captured in regulatory documentation to aid compliance. Once it has identified the metrics of the future, the DOD should publish updates to their functional instructions to formalize data requirements in DOD Instruction (much like what has been done with the new acquisition pathway supplements to DODI 5000¹⁸). Written authorization will go a long way to overcoming organizational challenges (silos and systems) and collecting data from resistant units.
- **Good is Better Than Perfect:** The absence of a specific data element should not slow the progress needed on ADVANA's business health metrics. Experts agree that an iterative process is necessary to enable progress and learning. A metrics program that delays implementation because of missing data elements is a bad metrics program. As noted by the Prussian general and military theorist Carl von Clausewitz, "The enemy of a good plan is the dream of a perfect one."¹⁹

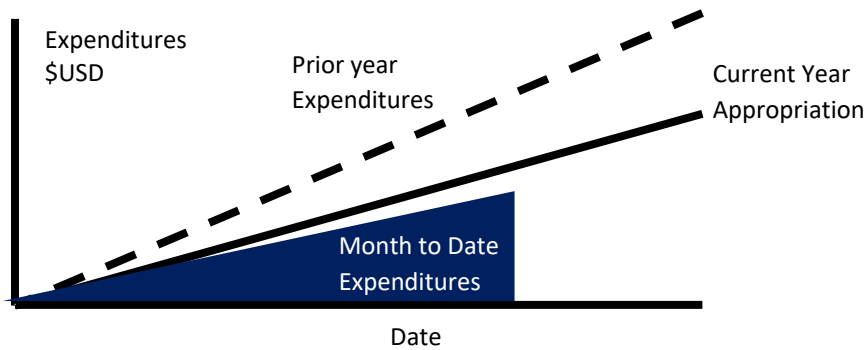
Recommendations pertaining to the fundamental elements of the metrics themselves remain applicable as well, including²⁰:

- **Visualization:** Visualization is defined as the representation of a set of information or a situation as a chart or other image. Dashboards are designed to track, analyze, and display KPIs, business health metrics, and other critical data points. If designed properly, dashboards empower both technical and non-technical users to understand and leverage business intelligence to make informed decisions. A hallmark of private sector dashboards and presentations is the visualization of complex data to easily tell a story, which then enables rapid decision-making. As a result, the DOD should continue to prioritize the development of visualization dashboards within ADVANA.
 - **Illustrative:** The image below illustrates tracking of a daily performance metric (e.g., total expenditures) vs. prior year and budget:
 - Actual - blue shaded area;
 - Budget - black line; and
 - Prior Year (other benchmarks easily added).

¹⁸ Department of Defense. (2019, December 30). Operation of the Middle Tier of Acquisition (DOD Directive 5000.80). <https://www.esd.whs.mil>

¹⁹ Supply Chain Movement. (2018, November 1). *Working Wisdom: Quote About Planning and Execution*. <https://www.supplychainmovement.com/working-wisdom-quote-about-planning-and-execution/>

²⁰ Defense Business Board, (2022, May 12). Executive Analytics in DoD & a Review of Private Sector Best Practices. (Report No. DBB FY 22-02). <https://dbb.defense.gov/>



- **Trending:** A trend is a pattern found in time series datasets. Trending of data alerts a manager to an upward or downward movement for a part, or all of, the time series. Trend analysis is critical, as it allows an organization to assess how it performed over time and to predict where current business operations and practices will take the organization. If done properly, trend data will alert management to an area of concern (or opportunity) that warrants action. The DOD should incorporate trending analysis into its dashboards to facilitate the rapid identification of concerning trends in any area being measured.
- **Benchmarking:** Benchmarking is the process of comparing performance against that of best-in-class organizations, determining how they achieved their outcomes, and using the information to improve.²¹ Benchmarking allows organizations to avoid the common trap of measuring internally; they may be doing better than the plan, but not the competition. If competitor data is unable to be obtained, or uncovers practices that are unworthy of being emulated, organizations may still find value comparing against non-competitors to discern best functional practices in any industry. This can often lead to new uses for existing ideas in a novel way.²²
- **Consistent Component-Level Executive Dashboards:** While metrics may change at different levels in the organization, the DOD would benefit from consistent reporting of key indicators on Component-level executive dashboards. As a business process expert (and six-sigma black belt) stated, “To get an organization in alignment, the measures of success from the top [to the bottom] down to each individual position should be aligned.”²³ Greater correlation and utilization [of common executive metrics] would reinforce cultural shifts, improve data quality, and drive outcomes—something much needed in the heavily federated culture of the DOD. The DBB Executive Analytics Study echoed these sentiments across over a dozen interviews with private industry executives, who underscored the imperative to define key indicators at an enterprise level and who work with leaders *to ensure that metrics are created at each level that ladder up to the organization-wide metrics and goals.*²⁴

²¹ Motwani, Jaideep & Sower, Victor. (2006, May). Benchmarking in Services. *Benchmarking, an International Journal*. 13(3).

²² Tucker, Frances Gaither & Zivan, Seymour M. (1987, February). How to Measure Yourself Against the Best. *Harvard Business Review*. Retrieved on 4 October 2022, from <https://hbr.org/1987/01/how-to-measure-yourself-against-the-best>

²³ Professional Growth Systems. (n.d.). Creating Meaningful Metrics throughout the Organization. Retrieved: 5 Oct 2022. From: <https://professionalgrowthsystems.com/purpose-vision-culture/creating-meaningful-metrics-organization/>

²⁴ Defense Business Board, (2022, May 12). Executive Analytics in DoD & a Review of Private Sector Best Practices. (Report No. DBB FY 22-02). <https://dbb.defense.gov/>



When a Silicon Valley Upstart Embraced a Culture of Data

GoDaddy is the world’s largest web hosting and domain name registrar provider. Much of its success is due to a culture of data that has been instilled by its executives. According to the Chief Revenue Officer, “Every business review starts with a score card because it defines, and forces alignment around, the strategy. Here are the things we say matter. Here is how we say whether we are succeeding against them. Are we delivering or aren’t we?”²⁵

Even if organizations don’t have all the data they need right now, the CRO recommends an evolutionary approach. Use what you have now and fill in the gaps later. While a fierce advocate for analytics, he does not recommend gathering more data at the expense of making progress. “We absolutely seek to understand everything as fine-grained as we can, but we balance that against our obligation to take action. We never want to wait for perfected data—just start.”²⁶

Section IV

What DOD Can Learn from the Private Sector

The collection and analysis of timely, quality data is essential as executives in both the public and private sectors consistently rely on data and advanced analytics to make informed decisions.

If there is one term that both represents enormous potential and challenge to organizations, it is “big data.” Managing the sheer volume of data can be overwhelming, and if critical data is not identified in metrics or is buried in spreadsheets or is held by different personnel across an organization, it stymies the health of the organization and impedes informed executive decision-making. Quality metrics are timely, reliable, standardized, balanced, aligned to strategy, and data-driven. At the Chief Executive/Chief Operating Officer level, they should be kept to an essential minimum. At Functional levels below the C-level, metrics should be balanced and standardized across units for comparative purposes with some level of customization of KPIs that are especially relevant to the performance of the functional area.

Dashboard The RFI sent to private sector companies revealed a high degree of consistency, of the business health metrics, reflected in leadership dashboards. In terms of quantity of metrics on the dashboard, the average number of metrics reviewed by a typical C-suite range from 20-30; functional leads may have more.²⁷ The dashboards of most private sector firms had a significant focus on financial performance (e.g., Revenue,

²⁵ Schrage, Michael. (2018, October 10). Making Strategic Decisions with Data. MIT Sloan Management Review. [Interview with Andrew Low Ah Kee]. <https://sloanreview.mit.edu/video/making-strategic-decisions-with-data/>

²⁶ Ibid.

²⁷ Defense Business Board, (2022, May 12). Executive Analytics in DOD & a Review of Private Sector Best Practices. (Report No. DBB FY 22-02). <https://dbb.defense.gov/>



Earnings Before Interest Taxes, Depreciation Amortization (“EBITDA”), Operating Cash Flow, and Earnings Per Share), which are not directly applicable to the DOD. In addition, many major companies have enhanced their dashboards to include strategic issues such as supply risk and availability, etc. The common theme is that these are all cross-organizational and aligned with the goals of the business. Therefore, metrics that measure the success of the NDS and priorities of the administration should be the primary focus of the DOD.

Innovation At the functional leadership level, private industry has a number of metrics directly applicable to DOD work. Many of these metrics correlate across businesses and sectors—they are common to multiple firms the Subcommittee collected data from. One specific example relates to measures of innovation. The DOD analytics team is planning to generate a portfolio of “innovation metrics,” whereas the private industry organizations surveyed didn’t consistently collect indicators this way. Indeed, some responded that they are still testing different methods of measuring innovation, including the percentage of applied research projects that develop into a product or the ratio of basic research dollars to applied research investment. The common thread across all responses however was that innovation is a “ribbon” that weaves through all business areas and spurs new initiatives or ideas that improve efficiency or facilitate the achievement of strategic goals.

Leading & Lagging Indicators The Subcommittee also noted that private businesses quite commonly use a mix of leading and lagging indicators on their dashboards. Leading indicators look forward to future outcomes and events. Lagging indicators look backwards to see if an intended result was achieved. Both are necessary to guide the performance of an organization.²⁸

“Red Metrics” Views on underperforming metrics are an area where DOD and private industry agree. Neither like them. The private sector laser focuses to rid their dashboard of underperforming metrics, with a timeframe for recovery set by leadership. Repeated failure to meet goals is met with accountability, has financial implications, and can even mean the loss of a job or position.

Despite its accountability implications, when measuring performance against goals, private industry appears to understand its importance in a healthy organization. Rather than considering every red metric to be a failure, companies understand that some red metrics enable initiatives to “fail fast” or to enable them to reevaluate a system or process to drive improvement. Red metrics appropriately draw the attention of management with the goal of fixing a problem early. As Rally Health, Inc., a consumer-centric digital health company, indicated, “One of the hardest things to learn is the concept of having ‘permission to fail’ – the idea that not only is failure sometimes expected, it is actually encouraged.”²⁹ This concept is crucial to any organization that embraces innovation—risk of failure is high when trying something new.

²⁸ Marr, Bernard. (2021). *What is a Leading and a Lagging Indicator? And Why You Need to Understand the Difference*. Bernard Marr & Co. Future Business Success. Retrieved 5 October 2022, from <https://bernardmarr.com/what-is-a-leading-and-a-lagging-indicator-and-why-you-need-to-understand-the-difference/>

²⁹ Freund, Sam. (2017, August 29). *When it Comes to Metrics, Being in the Red is OK. Really*. Rally Health. Retrieved on 28 September 2022, from <https://www.rallyhealth.com/engagement/comes-metrics-red-ok-really>



How Amazon Uses Leading Indicators to Evolve

Driving strategic outcomes in a sprawling multinational technology and e-commerce company with 1.4M employees and annual revenue of nearly \$500B is impossible without the right set of performance measures. In Colin Bryar and Bill Carr’s book, “Working Backwards: Insights, Stories, and Secrets from Inside Amazon,” metrics are described as the organizational instrumentation needed by business operators. “If you don’t instrument, you won’t know what’s going on. And if you don’t know what’s going on, you can’t possibly be a good operator.”³⁰

At Amazon, metrics are presented every week at a “Weekly Business Review.” To measure performance against goals, Amazon relies on both leading and lagging indicators. It refers to leading indicators as “controllable input metrics” because they represent the “levers” managers can pull to steer the organization. While keeping an eye on lagging metrics (Amazon calls them “output metrics”) to understand results, Amazon iterates on its leading metrics to ensure it is driving towards the outcomes it desires.³¹

When it was first expanding beyond selling books, Amazon started using a metric called “quantity of detail pages” as a leading indicator of sales. Every product on its website had a “detail page” where customers could initiate a purchase. The belief was that an increase in product pages would correlate to increased sales. However, in an attempt to boost detail pages, Amazon product teams didn’t always focus on listing items that were in high demand or easy to keep in stock. Weekly reviews revealed that their leading indicator was flawed—quantity of detail pages didn’t drive sales alone. Eventually, the leading indicator evolved to, “the percentage of detail page views where the products were in stock and immediately ready for two-day shipping.”³²

To Amazon, iteration on leading indicators is a resource-worthy endeavor—it happily spends hundreds of man-hours tinkering with the right metrics to use. The result of this process is a lever that helps executives drive the business to strategic outcomes, a powerful tool indeed.

Section V

Best Practice Business Health Metrics

The pages that follow contain specific metrics this Study identified as those that most organizations (public and private) consistently utilize. A common phrase used in the private sector is, “If you can’t measure it, you can’t manage it.” Our recommendations focus on the ‘top’ indicators from the private and public sectors that are most applicable

³⁰ Chin, Cedric. (2021, March 17). *This is How Amazon Measures Itself*. Holitics Blog - Business Intelligence. <https://www.holistics.io/blog/how-amazon-measures/>

³¹ Ibid.

³² Ibid.



to the DOD, national security, and workforce readiness. These metrics are designed to help identify conditions, assess progress, measure results, and manage risks.³³

When a Major Car Company Harnessed the Power of its Data

Nissan is no longer just a car company. Now, it is a “Technology company that moves people.”³⁴ After a period of significant change in the automotive industry, Nissan realized it could no longer make decisions the way it had in the past. Its business model was under attack, new competitors were entering the market, and senior leadership was under pressure to control costs. To stay relevant in the eyes of their customers, Nissan knew that it needed to find a way to harness the power of its data.

Nissan’s challenges were similar to many other global firms that make this leap. With a proliferation of data, “Most days felt very overwhelming,” the Regional Chief Data Officer (CDO) describes. Through company-wide data literacy, Nissan taught its employees how to move beyond a “sea of spreadsheets.”³⁵ The hardest part of the move towards data was creating a new culture. It started with advocacy and data awareness by senior leadership. With their backing, change managers disrupted legacy actions and ingrained behaviors. Initially, time and resources were scarce. By starting small to illustrate the potential of data in business operations, change managers achieved “quick wins” that garnered attention across the company and led to greater investment.

Today, Nissan has centered itself on trusted data. “This is the most important step in democratizing data across the enterprise,” the CDO explains. Its analytics platform is the “gateway” to have a contextual conversation across functional teams. The application is leveraged throughout the enterprise including its headquarters and at every affiliate location, plant, and dealership.

After a long journey, Nissan has reshaped how business and analytics work together towards the best business outcomes. Data is now part of its company’s DNA and has yielded significant savings to its bottom line—millions of dollars. “What has always felt like a brick wall, has been taken down.”³⁶

³³ Anderson, James. (Host). (n.d.). *Create IT Metrics That Matter to Executive Leadership*. [Webinar] Gartner. <https://www.gartner.com/en/webinars/4012721/create-it-metrics-that-matter-to-executive-leadership>

³⁴ Beringer, Danielle, (2019). *Nissan builds an enterprise data culture with Tableau, democratizing analysis across every dealer location*. [Conference presentation]. Tableau Conference 2019. <https://www.tableau.com/solutions/customer/nissan-builds-an-enterprise-data-culture-with-tableau>

³⁵ Ibid.

³⁶ Ibid.



Policy

Overview: The policy function for the DOD requires consideration of issues across all functions, organizational units, and geographic locations of the DOD. It must consider both business and operator issues and the integration of the two. Policy must also consider the strategic operating environment, including security threats, funding considerations, current law, as well as current Administration policies and priorities. Because of these reasons, responsibility for a portion of the metrics listed in this section may lie outside of the Office of the Under Secretary of Defense for Policy.

The most important and comprehensive recurring initiative in the policy area for DOD involves the preparation of and adherence to the NDS. This strategic document spans both the business and operator functions within the Department.

It is supplemented with other policy-related activities that include addressing key business challenges (e.g., GAO High Risk Areas applicable to the DOD, War Plan challenges, and various other policy initiatives within the Administration (e.g., COVID) and the Department (e.g., diversity and inclusiveness)).

The DOD must ensure that the NDS is based on credible current and future security threats to the U.S, including consideration of current and likely future funding levels. It must also conduct all ongoing DOD activities in a manner consistent with the National Security Strategy, Administration policy, and current law.

Recommended Metrics

Chief Executive Level:

- Major Variances from Current NDS
- Major Variances from War Plans, including Positioning and Readiness of Forces, Platforms, and Munitions
- Status of DoD Specific High Risk Areas as Identified by GAO
- Security Cooperation Status
- Status of Rightsizing / Realignment Efforts
- Status of Performance Management System

Functional Lead Level:

- Status of NSS / NDS Planning
- Defense Continuity / Mission Assurance
- Special Operations Low Intensity Conflict



Acquisition & Contracting

Overview: Successful and effective Acquisition & Contracting functions are essential for the DOD to achieve its mission. Acquisition and contracting professionals:

- Source and procure based on national strategic and core priorities, risk management, and best short-term and future results;
- Manage federal contracts that ensure agencies obtain the goods and services needed;
- Procure everything from IT systems and consultancy/services to weapons and everything in between;
- Act as stewards of taxpayer money by managing sourcing and spending and mitigating conflicts of interest;
- Negotiate contracts, cultivating a fair and open competition in the federal marketplace; and
- Attract and develop new service providers to strengthen the defense industrial base and to reduce the risk of foreign ownership and control of critical supply and key suppliers, while eliminating conflicts of interest.

DOD and private industry executives focus on several (but not all) acquisition and contracting outcomes and share many common metrics. The success of these functions is measured by the capabilities delivered to the customer (or warfighter) at point of use and consumption, with deployment in scale, at the right time, right quantity, and right cost at the minimum risk.

Current State of Metrics: The DOD Acquisition and Contracting functions have among the most consistent, standardized horizontal and vertical metrics research encountered in the DOD. However, these are generally for major “traditional acquisition” programs only, with cost, schedule, and system performance tracked at all echelons of the organization, consistent with industry practices. These do not always include critical sourcing areas such as risk and conflict of interest.

Recommendations:

- Apply metrics and management based on these metrics to all DoD weapons systems, munitions, supplies, consulting, and IT contracts/spend:
 - While the DOD’s rigorous tracking of the status of major programs is too much to apply to the broad universe of DOD acquisition programs (there were 3,960 Program, Project, and Activity line items in the Research Development Test and Evaluation (RDT&E) and Procurement Appropriations in the FY22 Budget Request, an aggregate view is needed based on the magnitude of the spend. For instance, the DOD’s FY22 budget request of \$715 billion included almost \$246 billion of acquisition-related funding (for goods or services). Of this amount, 30% is aligned to “major” programs, **thereby leaving approximately 70%, or \$172 billion, in annual acquisition and contracting spend without**



- a comprehensive level of reporting and analysis for senior DOD management.**³⁷ While this spend is delegated and tracked at lower echelons, there is insufficient transparency for senior DOD management, particularly given the budget share. It is essential that senior DOD management has an enterprise-wide view of acquisition and contract management, at least at an aggregate level, rather than only major programs.
- The DOD's use of Integrated Acquisition Portfolio Reviews ("IAPRs"), a recent concept in the DOD, attempts to bring a private industry practice of using "holistic", multi-attribute metrics to address a complex situation. It acknowledges that cost and importance are not always directly correlated and that other metrics are required to monitor and manage major programs. This is an important development. However, certain barriers to data availability (data standardization, accuracy, proprietary markings, availability, automation, etc.) and consequence management need to be addressed to bring a level of effectiveness and rigor to all DOD contracts.
 - Defense Industrial Base³⁸ Metrics:
 - Metrics to manage the industrial base need improvement; current measures are not aligned with all national needs (for example, risk, surge capacity, foreign ownership and control, security, and conflicts of interest). These must include the Organic Industrial Base ("OIB") and foreign suppliers.
 - The pressing issue facing the DOD is the US and EU dependency on China for much of its manufacturing, components, supplies, and materials, (ranging from semiconductors to pharmaceuticals to antibiotics). Metrics must be developed and implemented that focus on:
 - Foreign ownership;
 - Investment and influence of supplies down to the lowest critical material level;
 - Conflicts of interest that skew the acquisition of critical equipment, supplies, and materials; and
 - Potential risks in locating supply in risky regions.

³⁷ Department of Defense. (2021, May). *Program Acquisition Cost By Weapon System*. Office of the Under Secretary of Defense (Comptroller)/Chief Financial Officer. <https://comptroller.defense.gov/Budget-Materials/>

³⁸ The "Defense Industrial Base" refers to the collection of businesses, large and small, that DOD relies upon to provide the materials, equipment and weapons systems needed to defend the nation. The DIB includes the Organic Industrial Base (services' depots, shipyards, and arsenals)



Recommended Metrics

Chief Executive Level:

- Supply Security:
 - % systems, components, material contractors who have been assessed for key risk sourcing criteria – foreign ownership, executive conflict of interest, capability location, etc.
 - % spend: concentration of vendors at national level and # of vendors by category – from spend analysis
- Program and Contractor Performance by Code:
 - Significant cost/schedule variance on major acquisition programs
 - Watch list status and monitoring
 - Weighted average index/%: performance by vendor by pre-determined set of criteria
 - % weapons systems, munitions, supplies delivery performance to milestones
- Process Efficiency Elapsed Times and Costs:
 - Source to settlement by contract type
- Talent Development and Management in DOD (in house vs. outsourced):
 - Spend and % spend on services and consultancy contractors by service and by targeted (critical) areas
- Supply Capability:
 - New vendors within last nine months
 - % contracted in DIB and OIB by year (matched against historical trend of demand)
 - DIB (including OIB) capability and strength, % by category – surge capacity + capacity + inventory vs. estimated demand in ranges, minimum sustaining rate, # of suppliers per category, and financial strength of suppliers
- Speed: % Contracts with Early Deliveries to Milestones

Functional Level Lead:

- Develop and Maintain Key Risk Sourcing Criteria, including Supply Security
 - Capability
 - Location and distributed operations
 - Foreign ownership and control (all companies and parts in the Bill of Materials (“BOM”))
 - Executive conflict of interest
 - Financial strength
 - Supply base
 - Dual sourcing (# components/parts in the BOM for which more than one supplier is qualified to support supply requirements)
- Develop and Maintain “Guardrail” Parameters for Private, DOD, and NGO Operations (supply security)



Digital Modernization & Information Technology

Overview: In the private sector, digitization (the process of moving from the physical to the digital) is a priority. Digital modernization and the technology that supports it means speed. The “internet of things,” cloud computing, mobile devices, and web services have helped to bring products and services to market at a lightning pace. Industry leaders need metrics to enable them to monitor the progress of their organization’s transformation.

Material information technology investment decisions are made at the highest levels of organizations, as CEOs recognize that these decisions are critical to organizational change and core business processes.³⁹

The metrics gathered from private industry covered an array of indicators (e.g., application and hardware modernization, cybersecurity risk, budget share, helpdesk statistics, infrastructure utilization, and downtime). The theme that threaded all indicators was simple—how is IT evolving to better service customers, support employees, and drive business outcomes?

In addition to measuring customer satisfaction, most private companies also measure employee IT-related satisfaction because companies simply cannot afford to lose productivity due to IT-related issues. Research indicates that IT-related issues affecting employee performance are underreported each year.⁴⁰ Indeed, one survey⁴¹ indicated that the average employee will encounter two IT issues per week (with a productivity loss of 28 minutes per incident⁴²) while others suggest that the productivity loss rate is even greater.⁴³ Lack of reporting also drives a disconnect between what IT departments think of their tools and the real experience of the end user. Interestingly, 84% of surveyed employees believed their organization should be doing more to improve the digital work experience, but 90% of the IT leaders thought their workforce was satisfied with their technology tools.⁴⁴ This gap in perception is problematic because companies cannot afford employee dissatisfaction and attrition risk due to IT challenges.⁴⁵

³⁹ Martin, Bob L., Batchelder, Gene, Newcomb, Jonathan, Rockart, John F., Yetter, Wayne P., and Grossman, Jerome H. (1995, September). The End of Delegation? Information Technology and the CEO. Retrieved on 27 September 2022, from <https://hbr.org/1995/09/the-end-of-delegation-information-technology-and-the-ceo>

⁴⁰ Bourne, Vanson. (2020, April 4). The True Costs incurred by Business for Technology Downtime. Helpnet Security. <https://www.helpnetsecurity.com/2020/04/24/technology-downtime/>

⁴¹ Ibid.

⁴² Ibid.

⁴³ Ibid.

⁴⁴ Ibid.

⁴⁵ Ibid.



Recommended Metrics

Chief Executive Level:

- User Experience (by component, by IT system) vs. Target
- % of Retired / Consolidated / Decommissioned Systems vs. Target
- System Service Performance vs. Target
 - Network reliability and availability
 - Service response times
- Digital / Cyber Risk / Business Continuity Measures
 - National Institute of Standards & Technology (or other standard) Cyber Risk Score
 - % systems in use beyond end-of-life / support
 - Key cyber safety effectiveness measures: system recovery timelines
- IT Investments and Savings
 - Ongoing and projected IT development, modernization, and enhancement spend as a % total IT
 - Ongoing and projected operational savings resulting from IT development, modernization, and enhancement vs. target
 - Talent – trend of talent and critical skills supporting the modernization projects vs. planned

Functional Level Lead:

- Measure of IT Asset Footprint
 - Data centers
 - Applications
 - Tools inventory
 - End user devices
 - Accounts
 - Talent supporting IT per geographic location
 - Active connected suppliers
- Spend for Each of the IT Asset Categories
- Quantity of Information Systems On-boarded to ADVANA
- Data-based Decision-making



Energy, Installation, and Environment

Overview: “Climate change is an existential threat to our nation’s security, the DOD must act swiftly and boldly to take on this challenge and to prepare for damage that cannot be avoided.”⁴⁶ While no country or organization can solve the climate crisis alone, everyone must do their part.⁴⁷ As one of the largest organizations in the world, with millions of employees and a footprint in 170 countries, the DOD must be mindful of the environmental impact of its operations.

Access to sustainable, reliable, and affordable energy is fundamental to the United States economic and national security. The war in Ukraine has reinforced the energy, national security, economic, and climate risks associated with our reliance on traditional energy sources and the need to develop affordable, reliable, cleaner energy sources.

A clean environment is increasingly essential for health and economic prosperity, so governmental policies and industry practices continue to drive technological and energy-diverse innovations. CEOs are embracing environmentally sustainable practices across their businesses, including investing in green buildings, reducing greenhouse gas emissions and pollutants, diversifying into natural gas and renewable sources of energy, and recycling at greater rates.

Energy and environmental metrics are designed to assess the environmental impact of an organization’s activity. These metrics typically include reduction of electricity usage, change in fuel consumption, carbon emissions reductions, gallons of water saved, single use plastic reductions, and increased waste diversion.

In addition to measuring the reduction in emissions and energy usage, it will be also important for the DOD to measure the actual level of investment in smart energy solutions, and the return on such investments. Without investing in such alternative solutions, it is unlikely the DOD can meaningfully reduce its carbon footprint. Smart energy solutions include remote monitoring and controlling of building equipment; synchronizing devices and technology to operate optimally; tracking energy consumption for more accurate predictions of high-demand times and for avoidance of unplanned power outages that disrupt production and productivity; and energy performance where the life of a building

Recommended Metrics

Chief Executive Level:

- Climate / Energy Plan Implementation (plan / actual)
- Reduction of Electricity Usage
- Change in Fuel Consumption
- Carbon Emissions Reductions
- Gallons of Water Saved
- Single-use Plastic Reductions
- Waste Diversion (recycling)

Functional Level Lead:

- Measure of IT Asset Footprint
- Investment in Smart Energy Solutions
- Return on Energy, Installations & Environment Investments
- Diversification of Energy Sources

⁴⁶ Austin, Lloyd J. (2021, Oct 7). *Statement by the Secretary of Defense Lloyd J. Austin III on the Department of Defense Climate Adaptation Plan*. Department of Defense. <https://www.defense.gov/News/Releases/Release/Article/2803761/statement-by-secretary-of-defense-lloyd-j-austin-iii-on-the-department-of-defen/>

⁴⁷ Blinkin, Anthony J. (n.d). *Statement by the Secretary of State*. State Department. <https://www.state.gov/policy-issues/climate-crisis/#:~:text=Blinken,Secretary%20>



from design to commissioning to ongoing operations is measured. All are efforts to save energy, time, and money on the operating costs and to improve efficiency of a facility.

Efficient energy consumption, managing energy performance, and reducing negative environmental impacts reduce operational expenses and elevates environmentally sustainable responsibilities. As a result, the energy reduction goals should be allocated to all services so that they feel accountable for the results.



Financial Management

Overview: The Financial Management function oversees the efficient use of resources and acts as a strategic partner to the Chief Executive and Functional leaders. Key activities include financial reporting, planning, analysis, resource allocation, and cash management.

The primary objective of financial management is to link resources to results. In the private sector, this means managing a company's resources to maximize the value of the organization. With the DOD, they key result or outcome is to maximize our military capability.

Financial / Performance metrics play a key role in measuring success and fall into two general categories: budget-driven or profit-driven metrics. In the case of budget-driven organizations, financial managers focus on:

- Spend level – spend within budget
- Spend effectiveness – spend in the right areas
- Spend control – spend according to policy / guidelines

Financial Management is a category where there are many alternative metrics to select from depending on the organization need and priority. While the Subcommittee has selected a set of metrics commonly used in commercial businesses and appropriate for DOD, there are others to consider depending on the functional priorities. Following are examples of other commonly used metrics at functional levels:

- Expiring funds;
- “Maverick Spending” (\$ unauthorized spending);
- % of spend by targeted spend categories; and
- % fixed vs. variable spend.

Recommended Metrics

Chief Executive Level:

- Total Expenditures / Obligations as % Appropriation
- Total Expenditures vs. Prior Year
- Tooth to Tail⁴⁸ Expense Ratio vs. Plan and Prior Year
- Status of Pending Appropriations, Supplemental, Rescissions and/or Reprogramming Actions
- Status of GAO High Risk Designation

Functional Level Lead:

- Fund Balance with Treasury
- Units Above Budget Targets
- % DOD Audits with Unqualified Opinions and vs. Prior Year
- # Material Weaknesses in Total and vs. Prior Year
- Status of Budget Preparation

⁴⁸ “Tooth to Tail” is defined as the amount of personnel it takes to supply and support those whose primary function is to engage in combat. In this section, the metric is expressed in dollars.



Human Resources

Overview: People are vital to the success of any organization, public sector or private. Private companies are committed to attracting and retaining the best talent to maximize results. The importance of human capital is included in all strategic communications, including Secretary Austin's top three priorities in his March 2021 "Message to the Force." It is a cornerstone of the 2022 NDS in advancing Department goals through "Building enduring advantages" and is proudly counted as one of the four strategic goals of the SMP.

Successful private corporations understand the difference between Human Resource Management and Personnel Management. To these firms, Human Resources focus on values and mission [over policy], want managers who are transformational facilitators [versus transactional negotiators], focus incentives on performance [not fixed grades], design jobs for teamwork [not division of labor], maximize access to training and development [versus controlling access], and emphasize mutual interests [not just organizational goals].⁵⁰

Effective human resource practices lead to commitment by employees, critical to achieving the outcomes private businesses want. Studies support this idea, finding that employees with the highest levels of commitment "perform 20% better and are 87% less likely to leave the organization."⁵¹ Committed employees also tend to be safer and healthier, thereby reducing health care costs.⁵²

With the link between employee commitment and organizational performance, it is no wonder that most companies prioritize the metrics that measure it. These include employee experience ratings, attrition/retention rates, and diversity/inclusion statistics, all of which help to create an attractive and supportive culture to empower and welcome world-class talent.

Recommended Metrics

Chief Executive Level:

- Total Headcount / End Strength as Compared to Plan and Prior Year
- Status of Recruiting, Re-enlistment Efforts, and Turnover Rates
- Readiness of Military Troops
- Tooth to Tail⁴⁹ Headcount Ratio Compared to Plan and Prior Year
- Employee Satisfaction Results
- Diversity/Inclusion Statistics

Functional Level Lead:

- Average Time to Hire
- # Critical Positions Unfilled Compared to Plan and Prior Year
- Use of Alternative Hiring Authorities
- Vacancy Rate (the # vacant positions as a % total billets in the enterprise)

⁴⁹ "Tooth to Tail" is defined as the amount of personnel it takes to supply and support those whose primary function is to engage in combat. In this section, the metric is expressed in numbers of people.

⁵⁰ D. Shivarudrappa, K. Ramachandra, and K.S. Gopalakrishna. (2009, December 1). *Human Resource Management*. <https://ebookcentral.proquest.com/lib/pentagon-ebooks/detail.action?docID=3011329>

⁵¹ Ibid.

⁵² Society for Human Resource Management. (2011, January 1). *Human Resources in Resource and Practice: The RQ Reader*. <https://ebookcentral.proquest.com/lib/pentagon-ebooks/detail.action?docID=794382&query=Human+Resources+in+Research+and+Practice%3A+The+RQ+Reader%2C+SHRM%2C+page+3%2C+2011>.



Health (Medical)

Overview: The Medical Health Services (“MHS”) provided by the DOD includes hospitals, clinics, outpatient, and pharmacy facilities worldwide to support Active Duty, Guard and Reserve military members and their dependents, occupational and industrial health care, and specialized services for the training of medical personnel. Additionally, the MHS purchases more than 65 percent of the \$18 Billion in total care provided for beneficiaries through tailored contracts, such as Managed Care Support Contracts responsible for the administration of the TRICARE benefit.

Measuring the health of individual soldiers, sailors, airmen, marines, and guardians is essential to warfighting readiness; these metrics capture physical and mental health factors, vaccination status and whether an individual has medical conditions that limit deploy ability—short or long term.⁵³

The DOD is committed to preventing suicides in the military community and is taking proactive steps to provide additional mental health, counseling, and prevention capabilities for Total Force members. Secretary of Defense Austin created an independent panel to review suicides in the military; their report is due in December 2022 and may identify additional metrics that warrant senior level review. DOD reports suicide data to Congress each quarter.

Measuring average costs by age category will allow the Department to see cost trends over time compare trends to private sector providers.

Expeditionary medical support includes deployable hospitals, the number of exercises DOD is capable of supporting; medical operations support, assesses DOD’s food and water safety programs, status of working dog physicals, etc. These activities are directly linked to readiness.

DOD medical reform efforts have been slowed for several years; tracking progress will allow the DOD to estimate costs and manpower more accurately and achieve efficiencies in health care delivery.

Recommended Metrics

Chief Executive Level:

- Medical and Dental Readiness
- Suicide Rates
- Average Medical Cost Per Member / Year
- Patient Satisfaction
- Access to Care / Time to Appointment

Functional Level Lead:

- Mental Health Services Availability and Utilization
- Expeditionary Medical Support
- Population and Cost by Category; CONUS/OCONUS
- Direct Care and Private Sector Care System Workload
- Progress on Defense Health Activity Reform Efforts

⁵³Medical metrics are focused on the medical services provided to active duty, Guard and Reserve Service members and their dependents. Medical readiness for Service members is essential to warfighting capability and meeting the nation’s national security mission.



Innovation

Overview: Innovation is often identified as the “secret sauce” of business success. The ability for enterprises, not just individuals, to operate innovatively is often a journey of culture, process, and commitment to transformation.

To innovate, organizations must become comfortable questioning assumptions, looking for insights both internally and externally, learning, experimenting, and actively communicating both successes and lessons learned from their efforts. It is also critical to recognize a wide range of innovation types. Major breakthroughs in technology and competitive disruptions, while important, are not the only type of innovation an organization needs. Innovation can be found in products, services, and new and useful business practices, which can drive reductions in operational expenses.

For innovations to succeed in advancing the organization, it is critical that there be a clear line-of-sight between the strategic intent and desired outcomes. The alignment of strategy to innovation activity also helps when prioritizing the organization’s resources in order to achieve targeted results, ranging from operational savings to creating a strategic business advantage. Planners must establish innovation projects with clear outcomes and criteria to both launch and complete.

As the DOD moves forward to strengthen its focus on innovation, it is recommended that leadership:

- Motivate organizational focus on innovative thinking;
- Review metrics and lessons learned across organizational boundaries; and
- Share and celebrate all aspects of success, including expense reduction, learning, and achievement throughout the process.

Recommended Metrics

Chief Executive Level:

- # and Size (\$\$) of Projects Underway
- % Target Projects that Transitioned Into Use (adoption rate)
- Projected Savings / Benefit of Each Project vs. Target vs. Actual Savings / Benefit⁵⁴
- Critical Lessons Captured from Terminated and Completed Projects

Functional Lead Level:

- # Innovations Submitted for Patent / Awards vs. Patent / Awards Achieved
- # Ideas in Various Phases of Development and \$\$ Spent in Each Phase:
 - # in development
 - # in test
 - Test pass % and rate of passing
 - Ready for transition into implementation / ops
- # Employees / Teams Recognized for Innovative Results
- # Ideas that Achieved Intended Savings / Benefit
- # External Partners / Suppliers Supporting Innovation

⁵⁴ **Note:** Benefit can cross many areas such as \$\$ reduction, performance, enhancements, user (customer and employee) satisfaction, etc.



Logistics

Overview: Logistics in the private sector is a major component of the end-to-end supply chain, encompassing the physical flow of materials from the point of first supply to the delivery to the end consumer, service, and back. In the DOD context, logistics extends to the planning, deployment, and management of inventory (including Order to Delivery (“OTD”)); the planning for surge events; the design and implementation of the logistics network (e.g., manufacturing, on-site spares and inventory, pre-positioning, transportation), demand estimation and consumption; and the matching of supply with demand. Disruptions and shortages will result in out-of-stock situations, high costs and working capital requirements, lack of supply and, most important, the inability of our armed forces to execute their missions and, therefore, create a major national vulnerability.

The primary objectives of a “logistics system” is to maximize availability to the user in stable and surge events, setting and achieving service levels (typically On-Time In-Full replenishment rates that drive customer satisfaction and availability). Service levels are determined by the type of product and its criticality. In the private sector, metrics include optimizing pipeline velocity and satisfaction across the Customer Life Cycle.

Critical logistics measures include inventory and deployment, redundancy to reduce risk, asset utilization and management (for example, depot capacity, transportation uptime, and critical equipment uptime based on spares availability), customer performance data, and feedback (where the customer is typically the ordering party and/or the end consumer). These measures include performance data and regular customer feedback. In today’s uncertain and volatile environment, this includes working with the Acquisitions function to assess risk and foreign ownership/control of suppliers and providers.

Recommended Metrics

Chief Executive Level:

- Customer Service: % On-time, In-full Delivery to End User
- Material Availability: % Order Fill Rate by Class of Item Against Requirements
- Inventory Management and Deployment:
 - Time (elapsed days) to delivery – munitions, spares, supplies
 - Days of inventory based on consumption estimates: Inventory levels and valuation by service by category
 - % and days: Inventory ageing (time is both from order and from plan requirement)
- Logistics Process:
 - Mission capable status of logistics platforms
 - Platform capacity for normal and emergency (short tons and passengers)
 - Warehouse / depot capacity utilization – owned and leased
- Process Efficiency Elapsed Times: Order to Delivery (OTD) to End User



Borne out of military necessity, dating from the Babylonian Empire's Logistics Corps of the 20th Century B.C., logistics and defense go hand in hand. Rear Admiral Henry E. Eccles's 1959 succinctly stated, "Logistics is the bridge between the economy of the Nation and the tactical operations of its combat forces."⁵⁵ Given that it is the "bridge," the logistics network must also consider the risks of disruption. As such, surge capacity, hedging and redundancy must be part of the logistics process. Logistics is the critical component of national security and, as such, must be measured, tracked, and managed closely.

Recommended Metrics

Functional Level:

- Customer Service: by Category and Region, Weapons Systems, Munitions, Spares
 - % delivered on-time, in-full
 - Order and request response time (customer wait time)
- Inventory Management by Weapons Systems, Category, Service
 - Material availability to customer request
 - Backorders, quality-defect free shipments
 - Stock outs by category and region (current and future expected)
 - Pre-positioning status (troops, systems, and stockpiles)
 - Inventory levels/valuation by region, category, type
 - Inventory ageing by category, type
- Logistics Process
 - Mission capable status of logistics platforms
 - Platform capacity for normal and emergency (short tons and passengers)
 - Warehouse/depot capacity and utilization by region, service
 - On-time delivery performance
 - Vehicles and equipment utilization rate
 - Time definite delivery (measures supply chain performance against a defined delivery standard)

⁵⁵ Ghiani, Gianpaolo; Laporte, Gilbert; Musmanno, Roberto. (2013, April 1). Introduction to Logistics Management. Wiley Publishing. <https://ebookcentral.proquest.com/lib/pentagon-ebooks/reader.action?docID=1120905>



Resource Planning

Overview: The resource planning function within the DOD requires consideration of issues across all functions, organizational units, and geographic locations of the DOD. It must consider both business and operator issues and the integration of the two. Most importantly, it is designed to determine and reconcile the resource needs of the DOD under the NDS with the resource allocations provided by the Congress. This will inherently require reassessing priorities and reallocating human, physical and intellectual resources, and investments.

Given global security risks in a fiscally constrained environment, one of the biggest resource allocation challenges within the DOD is the need to reduce overhead (i.e., cut the tail) and enhance warfighting capabilities (i.e., sharpen the teeth). DOD also needs to continually assess its requirements considering credible current and future threats, and the ability of the industrial base to provide needed weapons, supplies, and other capabilities. Resource planners must balance priorities to right size the DOD to maximize warfighting capability.

Recommended Metrics

Chief Executive Level:

- Major Gaps Between Request (FYDP) and Available Funding
- Status of Rightsizing / Realignment Efforts
- R&D Spending Versus Budget and Prior Year
- Strength of the Industrial Base (e.g., sole source, foreign ownership, financial stability, supply reliability, production capacity)
- Status of Major Resource Investments

Functional Lead Level:

- Status of Annual Budget, Planning, Programming, Budgeting, & Execution (PPB&E), Appropriations, Supplemental, and Sequesters, as Applicable
- Resources Against Current Strategy vs. Resources Against Future Strategy
- Status of Resource Planning Process
- % Resource Planning Projects On / Off Track
- Status of Execution of Key Resource Allocation Projects
- Status of Meeting Supply Commitments to Allies and Partners
- Congressional Marks Review



Security

Overview: Like most large organizations, the DOD and its Components view security as a high priority. Many private sector companies track the total cost of security, background check timeliness, insider threat activity and resolution, sensitivity of material mishandled, security incidents, and unauthorized physical access.

Visibility into the total cost of security is important for ensuring proper resourcing and identifying outliers.

Background investigation timeliness continues to be a worthy metric for the DOD. Slow investigations can delay training and deployment for military members and hamper hiring for critical national security modernization efforts executed by the DIB.

Most large private sector companies have an insider threat program designed to minimize risk tied to employee behavior. Many track behaviors that increase risk of blackmail (such as significant gambling losses), unexpected changes in financial status, and unauthorized use of controlled IT systems. Active insider threat programs are an important deterrent to high-risk behaviors and can speed closure of threat management cases.

Measuring the sensitivity of material mishandled/ex-filtrated can aid in characterizing military capability compromised. DOD can measure documents or data bytes of data lost or compromised and the corresponding classification or sensitivity level of each document. A weighted measure of the classification and number of documents/data bytes can help quantify the risk of the loss of data.

The number of reportable security incidents, coupled with unauthorized installation access statistics, is an important measure of physical and system security both for DOD and private industry. Empirical data in this area is important in understanding the success of initiatives, the effectiveness of resources, and the degree of additional action necessary.

Capacity/availability of secure workspace also needs consideration. The impact of COVID-19 on the workforce and workplace is complex and has been particularly difficult on those who work with classified data, processes, and systems. The DOD needs to

Recommended Metrics

Chief Executive Level:

- Enterprise Cost of Personnel & Physical Security
- Background Investigation Cost / Timeliness
- Special Access Programs Oversight Plan / Actual
- Insider Threat Program
- Sensitivity of Material Mishandled / Ex-filtrated
- # Reportable Security Incidents; Annual Trends

Functional Lead Level:

- Population in Continuous Evaluation / Trusted Workforce 2.0
- Capacity / Availability of Secure Workspace
- Threat Management Cases / Time to Resolve
- Resolution of Security Audit / Inspection Findings
- Unauthorized Installation Access



measure its capacity for secure workspace on installations and in the DIB to know how much of the workforce can be accommodated in a variety of workforce modes.

Wrap up: In summary, as requested in the TOR, the Subcommittee identified private industry best practices as it relates to the selection and use of performance metrics, benchmarks, and targets at the enterprise and functional level for each of the eleven focus areas.

Section VI

Leading & Lagging Indicators

The collection of metrics included above provide key insights into the business health of the DOD. Experts agree that a mix of both leading and lagging indicators are important to characterize the health of an organization.⁵⁶ “If a leading indicator informs executives of how to produce desired results, a lagging indicator measures current production and performance.”⁵⁷ When used collectively, they can illustrate both progress of the past as well as clues to the future. When companies focus too heavily on one or the other, they may make poor choices based on under-informed assumptions or miss opportunities to influence outcomes.

The Subcommittee identified the following leading and lagging private sector metrics for consideration:

Acquisition & Contracting

Leading	Lagging	Explanation
<ul style="list-style-type: none"> Spend concentration (% of investment budget by vendor) New vendors selected for onboarding in the last nine months % contracted in the DIB and OIB by year, matched against historical demand % weapon systems, munitions, supplies delivery performance to milestones 	<ul style="list-style-type: none"> Defense Industrial Base capability and strength % contracts with early deliveries to milestones and dates 	<p>Participation in the DIB (change in concentration of spend and onboarding new vendors), should affect the overall health of the DIB (production capacity, inventory vs. demand, # of suppliers, etc.) and improve delivery performance (portfolio health).</p> <p>% Contracted in the DIB and OIB by year is predictive of supply capacity.</p>

⁵⁶ Marr, Bernard. (2020, October 23). *What's the Difference Between Lagging and Leading Indicator?* Forbes. <https://www.forbes.com/sites/bernardmarr/2020/10/23/whats-the-difference-between-lagging-and-leading-indicator/?sh=284f13515009>

⁵⁷ Watts, Stephen. (2019, November 1). *Leading and Lagging Indicators: What's the Difference?* BMC. <https://www.bmc.com/blogs/leading-vs-lagging-indicators/>



Digital Modernization & IT

Leading	Lagging	Explanation
<ul style="list-style-type: none"> • % of retired / consolidated / decommissioned systems • System Service Performance (Network reliability and availability, service response times) • Quantity of systems on-boarded to ADVANA 	<ul style="list-style-type: none"> • User experience • Data-based decision-making 	<p>Success of hardware refresh programs and the state of system performance is indicative of the experience of the IT user.</p> <p>As more systems are integrated into ADVANA, the probability of data-based decision-making will increase.</p>

Energy, Installation, & Environment

Leading	Lagging	Explanation
<ul style="list-style-type: none"> • Investment in smart energy solutions 	<ul style="list-style-type: none"> • Carbon emission reductions 	<p>Investments in smart energy solutions should result in carbon emission reductions.</p>

Financial Management

Leading	Lagging	Explanation
<ul style="list-style-type: none"> • Total obligations as a % of appropriation • Status of pending appropriations, supplemental, rescissions, and/or reprogramming actions 	<ul style="list-style-type: none"> • Total expenditures as % appropriation 	<p>As spending obligations approach 100% of appropriation, room to adjust actual expenditures will be limited.</p> <p>In addition, the ability to deliver on spend plan will be negatively impacted by variability in timing of appropriation funding.</p>

Human Resources

Leading	Lagging	Explanation
<ul style="list-style-type: none"> • Status of recruiting, re-enlistment efforts, and turnover rate • Employee satisfaction results • Diversity / inclusion statistics 	<ul style="list-style-type: none"> • Total headcount / end strength as compared to plan and prior year 	<p>All three metrics contribute to the success of the Department to acquire personnel and meet its human capital requirements.</p>



Health

Leading	Lagging	Explanation
<ul style="list-style-type: none"> Mental healthcare availability / utilization 	<ul style="list-style-type: none"> Suicide rate 	<p>“Correlations have frequently been found between suicide rates and the availability of mental health care, use of mental health care, or barriers to use of care” (RAND, 2018)⁵⁸. There exists some evidence to associate greater availability of mental health care with a reduction in suicide rate.</p>

Innovation

Leading	Lagging	Explanation
<ul style="list-style-type: none"> # approved strategic initiatives 	<ul style="list-style-type: none"> % of target projects that transitioned into use (adoption rate) 	<p>The quantity of innovation initiatives should drive the # adopted.</p>

Logistics

Leading	Lagging	Explanation
<ul style="list-style-type: none"> % on-time, in-full delivery to end user Time to delivery (elapsed days) – munitions, spares, supplies Days of inventory based on consumption estimates 	<ul style="list-style-type: none"> Mission capable status of logistics platforms 	<p>The timeliness of parts and equipment will contribute to the mission capable status of logistics vehicles (aircraft, trucks, ships). Time to delivery (elapsed days) predicts the supply capability while days of inventory based on consumption rates predicts supply availability.</p>

Resource Planning

Leading	Lagging	Explanation
<ul style="list-style-type: none"> Status of major resource Investments 	<ul style="list-style-type: none"> Major gaps between request (FYDP) and available funding 	<p>Current execution and change in estimated cost of major resource investments will contribute to the forecast of FYDP disconnects.</p>

Security

Leading	Lagging	Explanation
<ul style="list-style-type: none"> Insider threat program status 	<ul style="list-style-type: none"> Sensitivity of material mishandled 	<p>Status identifying and mitigating incidents by malicious / careless / compromised employees should relate to future trends in the magnitude of mishandled information.</p>

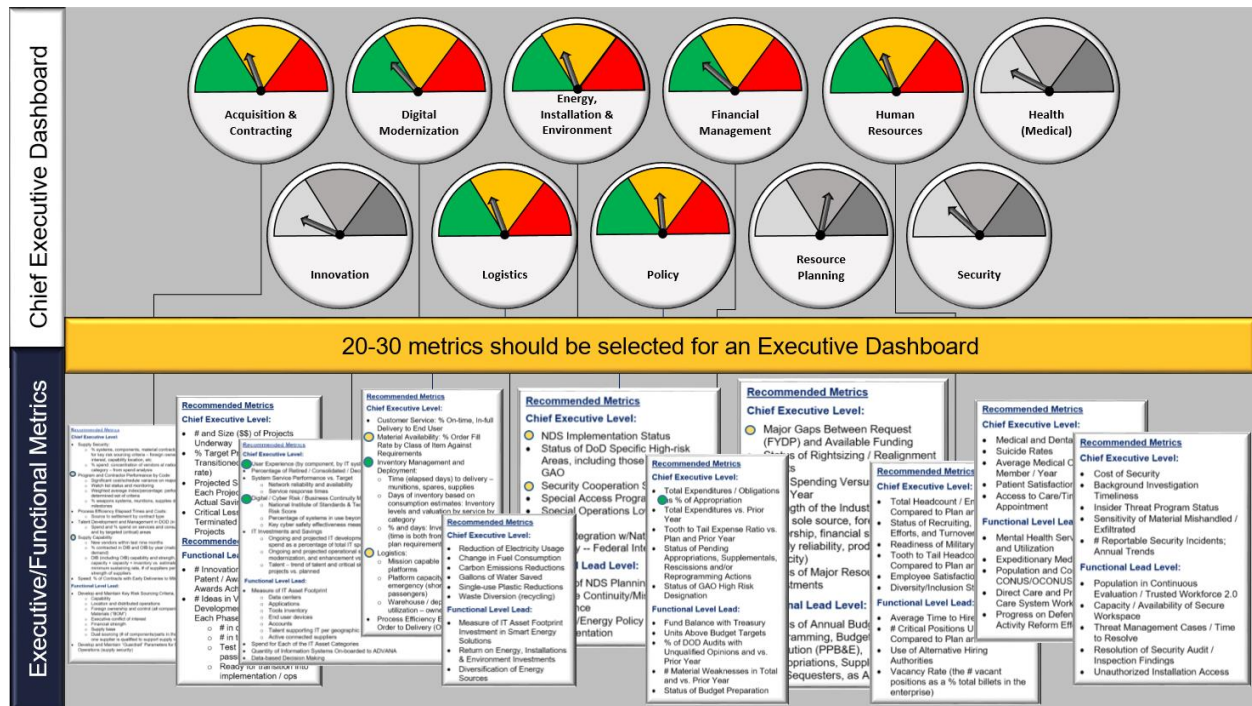
⁵⁸ Holliday, Stephanie B. (2018, March 2). *The Relationship Between Mental Health Care Access and Suicide*. RAND. <https://www.rand.org/research/gun-policy/analysis/essays/mental-health-access-and-suicide.html>



Section VII

Executive Analytics Dashboard

This Study confirmed that most CEOs in the private sector obtain a daily and/or weekly dashboard that summarizes the most important metrics (20-30) for the organization. The DOD leverages a similar dashboard that is prepared for the Secretary and Deputy Secretary. The Subcommittee recommends the DOD consider the entirety of the metrics listed in Section V above and select the 20-30 that will enable the Secretary / Deputy Secretary to readily assess the health of the DOD business functions. The selected metrics should not only underpin the NDS, but describe the key strategic priorities of Department leadership (e.g. people, industrial base health, environmental factors, cooperation with partners). The list of 20-30 recommended metrics may not always include inputs from each functional area, and may change over time based on priority.⁵⁹ When determining metrics for inclusion in the dashboard, the DOD should consider the principles described in the Executive Analytics Study, including periodic reviews and validation of the appropriateness of such measures.



The illustration above depicts an example executive dashboard supported by the metrics described in Section V of this report. The Subcommittee recommends selecting 20-30 for this purpose based on dashboards used by CEOs/COOs in the private sector. It is possible that only a subset of the functional areas will be represented on the dashboard and the metrics may change over time. Metric weights used in the composite view should be based on their relative priority in supporting the strategy.

⁵⁹ Anderson, James. (Host). (n.d.). *Create IT Metrics That Matter to Executive Leadership*. [Webinar] Gartner. <https://www.gartner.com/en/webinars/4012721/create-it-metrics-that-matter-to-executive-leadership>



Final Thoughts

Developing a comprehensive set of Business Health Metrics for an organization as large and complex as the DOD may seem like a daunting task. However, the foundation is strong: DOD has access to a vast array of invaluable data; ADVANA has been designated as the single system to integrate the disparate DOD systems; private sector metrics and best practices have been provided to the DOD; and DOD leadership is committed to becoming an organization that consistently uses data to make informed decisions. The current ADVANA executive analytics dashboard represents a solid prototype that will evolve over time, as additional data becomes integrated into the tool, and as the behavioral changes recommended in this Report are consistently executed. DOD leadership should establish a cadence of reviewing the selected metrics to assess what is working, what is not, and what changes should be made. Over time, the dashboard should be crafted, shaped, and finely tuned into the metrics that ultimately give the DOD transparency into what matters and a tool to use data to drive action. This process will better enable the DOD to achieve its ultimate objectives and strengthen our military capabilities.

Signatures

Erin Hill
Subcommittee Chair

Hon. David Walker
Subcommittee Co-Chair

Craig Albright
Subcommittee Member

Dr. Christopher Gopal
Subcommittee Member

Linnie Haynesworth
Subcommittee Member

Mellody Hobson
Subcommittee Member

Suzanne Leopoldi-Nichols
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Dr. David Van Slyke
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Pat Zarodkiewicz
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Appendix A – Terms of Reference



DEPUTY SECRETARY OF DEFENSE
1010 DEFENSE PENTAGON
WASHINGTON, DC 20301-1010

AUG - 3 2022

MEMORANDUM FOR DEFENSE BUSINESS BOARD

SUBJECT: Terms of Reference — Business Health Metrics

On February 4, 2022, I issued a memorandum outlining how the newly created Chief Digital and Artificial Intelligence (AI) Officer will support Department of Defense (DoD) efforts to set up a strong foundation for data analytics and AI-enabled capabilities.

While I am encouraged by the progress DoD has made sourcing and cataloging enterprise-wide data and identifying business health metrics, we must continually evaluate industry best practices to determine: (a) if the right data is being collected; (b) if DoD has the right metrics to drive desired outcomes; and (c) how these metrics turn into actionable information used to improve the DoD.

Therefore, I direct the Defense Business Board (the Board), through its Business Transformation Advisory Subcommittee (the Subcommittee), to identify enterprise-level business health metrics that top-level executive (i.e., Chief Executive Officer), functional head level (e.g., Chief Financial Officer, Chief Information Officer, Chief Human Capital Officer, Chief Technology Officer), and private industry leaders leverage to inform decision-making and maximize the efficacy and effectiveness of their business operations. Specifically, the Board, through its Subcommittee, will focus on the following actions:

- Identifying private industry best practices as it relates to the selection and use of performance metrics, benchmarks, and targets at the enterprise (i.e., Deputy Secretary of Defense) and functional level (e.g., Under Secretary of Defense (Comptroller), Under Secretary of Defense for Acquisition & Sustainment, Under Secretary of Defense for Personnel & Readiness, Under Secretary of Defense for Research & Engineering, Chief Information Officer of the DoD, Under Secretary of Defense for Policy), used to manage business operations for:
 - Acquisition and Contracting
 - Digital Modernization and Information Technology
 - Energy, Installation, and Environment
 - Financial Management
 - Human Resources
 - Health (Medical)
 - Innovation
 - Logistics
 - Policy
 - Resource Planning
 - Security
- Providing recommendations on the lagging and leading private sector metrics (input, output, efficiency, and outcome) that would benefit Department leaders.



- Providing recommendations for how best to utilize metrics to change behavior at the business unit and executive levels.
- Any related matters the Board determines relevant to this task.

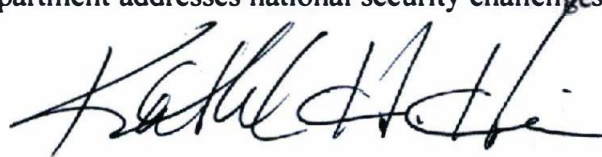
I direct the Subcommittee to submit its independent recommendations to the full Board for its thorough consideration and deliberation at a properly noticed and public meeting, unless it must be closed pursuant to one or more of the Government in the Sunshine Act exemptions. The Board shall submit its final, approved assessment and recommendations to the Secretary of Defense and the Deputy Secretary of Defense no later than November 30, 2022. Sufficient time shall be scheduled between the public meeting and the due date listed herein to enable revision based on Board deliberation.

In support of this Terms of Reference (ToR) and the work conducted in response to it, the Subcommittee and the Board have my full support to meet with Department leaders. The Board staff, on behalf of the Board and the Subcommittee, may request the Office of the Secretary of Defense and DoD Component Heads to timely furnish any requested information, assistance, or access to personnel to the Board or the Subcommittee. All requests shall be consistent with applicable laws, applicable security classifications, DoDI 5105.04, "Department of Defense Federal Advisory Committee Management Program," and these ToR. As special government employee members of a DoD federal advisory committee, the Board and the Subcommittee members will not be given any access to DoD networks, to include DoD email systems.

Once material is provided to the Board and the Subcommittee, it becomes a permanent part of the Board's records. All data/information provided is subject to public inspection unless the originating Component office properly marks the data/information with the appropriate classification and Freedom of Information Act exemption categories before the data/information is released to the Board. The Board has physical storage capability and electronic storage and communications capability on both unclassified and classified networks to support receipt of material up to the Secret level.

The Board and Subcommittee will operate in conformity with and pursuant to the Board's charter, the Federal Advisory Committee Act, the Government in the Sunshine Act, and other applicable federal statutes and regulations. The Subcommittee and individual Board members do not have the authority to make decisions or provide recommendations on behalf of the Board nor report directly to any federal representative. The members of the Subcommittee and the Board are subject to certain Federal ethics laws, including 18 U.S. Code § 208, governing conflicts of interest, and the Standards of Ethical Conduct regulations in 5 C.F.R. Part 2635.

Thank you in advance for your cooperation and support to this critical undertaking to inform subsequent decisions on how the Department addresses national security challenges in the coming decades.



cc:
Senior Pentagon Leadership
Directors of Defense Agencies
Directors of DoD Field Activities
Advisory Committee Management Officer, DA&M



Appendix B – Presentation to the Board



Defense Business Board

Recommendations for the Next Generation of

Business Health Metrics

November 10, 2022

DBB FY23-01

Task

The Deputy Secretary of Defense directed the DBB to identify:

1. Private Sector Best Practice Metrics

11 Functional Areas

- Policy
- Acquisition & Contracting
- Digital Modernization & IT
- Energy, Installation, & Environment
- Financial Management
- Human Resources
- Health (Medical)
- Innovation
- Logistics
- Resource Planning
- Security

2. Lagging & Leading Indicators

Recommendations on the lagging & leading private sector indicators that would benefit Department leaders

3. Suggestions to change behavior

Suggestions for how to best utilize metrics to change behavior at the business unit and executive levels



Subcommittee & Methodology

03

Members

Erin Hill, Study Chair

Hon. David Walker, Study Co-Chair

Craig Albright

Dr. Christopher Gopal

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Process & Methodology

- 12 week study
- Informed by data from 65+ public & private sector organizations / individuals
 - Yielded 600+ metrics
- Interviewed 8 DOD Leaders to better understand mission & to validate perspectives
- Prepared & analyzed responses to questionnaires from 12 Defense Agencies & Field Activities; and all 3 Military Departments
- Literature review included 85 publications, policies, plans, prior studies, videos, webinars, or other literary items



I. DOD Business Health Metrics: The First Generation

04

- DOD recognizes the benefit metrics can provide:
 - May 2021 “Creating Data Advantage” memo:
 - Data is a strategic asset – DOD CIO shall have access to all
 - ADVANA will be the “single source of truth”
 - Senior leader forums will rely on ADVANA—OSD shall use, Components coordinate
- Firm foundation exists, including:
 - Support and engagement from senior department leadership
 - An analytics application—with over 400 data systems on board
 - An initial set of ~300 business health metrics
 - An executive level dashboard



II. Why the DOD Needs Metrics

- Supervising the DOD is a significant challenge:
 - Size, Scale, and Complexity
- Federated Model
- Enterprise-wide visibility
- Metrics provide insight on progress toward strategy



DOD by the numbers

PERSONNEL:

2.91M

Inclusive of active duty, reserve, guard, and DoD appropriated fund civilian personnel

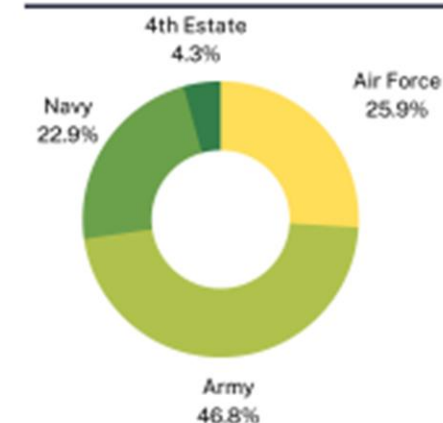
BUDGET:

\$752.9B



170

Countries host facilities that support DoD personnel across **4,800** sites



PERSONNEL BREAKDOWN

Includes the Active, Reserve, Guard, and Civilian workforce across the 3 military departments and 4th Estate

III. How to Mature the Next Generation of DOD Enterprise Metrics

06

1. Outcome-based Metrics

- Increase use

2. Standardization

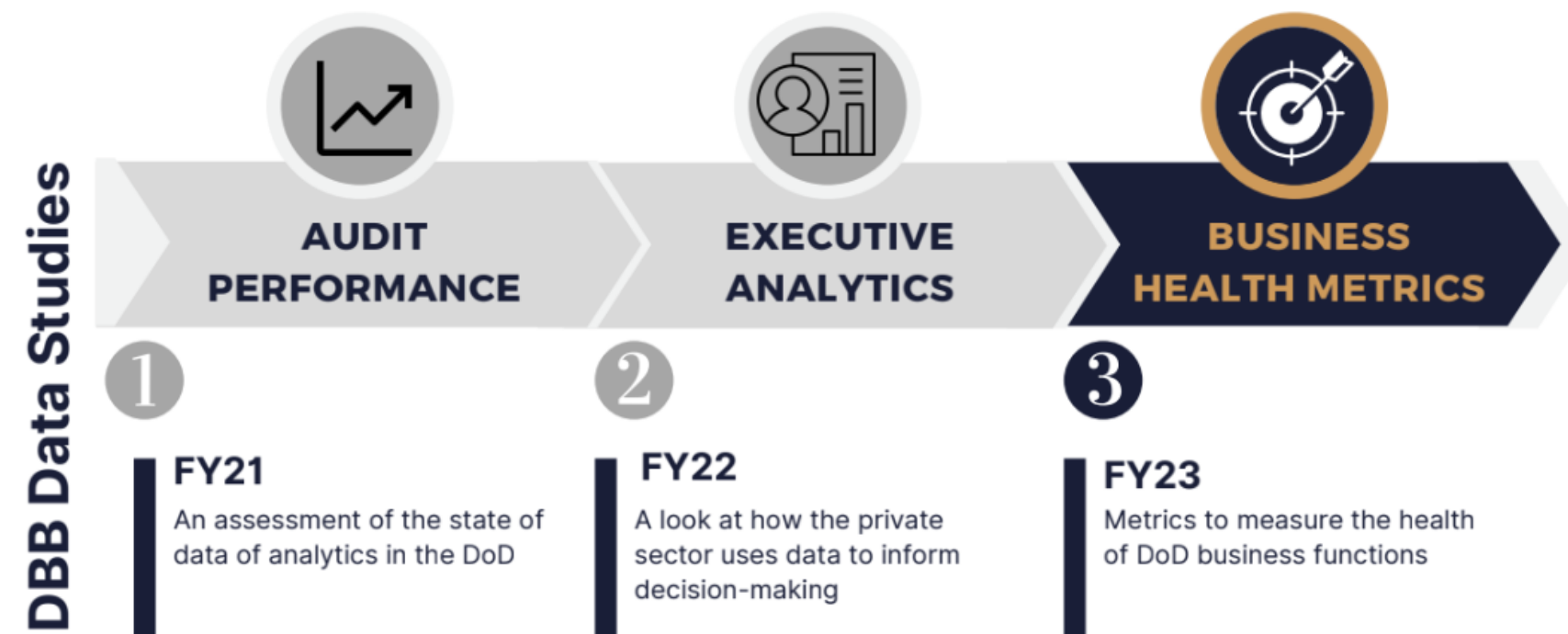
- Of Data, Policies, Processes, & Metrics

3. Culture

- Must continue shift towards data-driven decision making

4. Apply the principles of prior DBB Data Studies

- Rigorous Change Management
- Governance
- Transformational Leadership
- Resourcing
- Reporting Culture
- Standardizing Data & Codifying Requirements
- Good is better than Perfect



IV. What the DOD Can Learn from the Private Sector

07

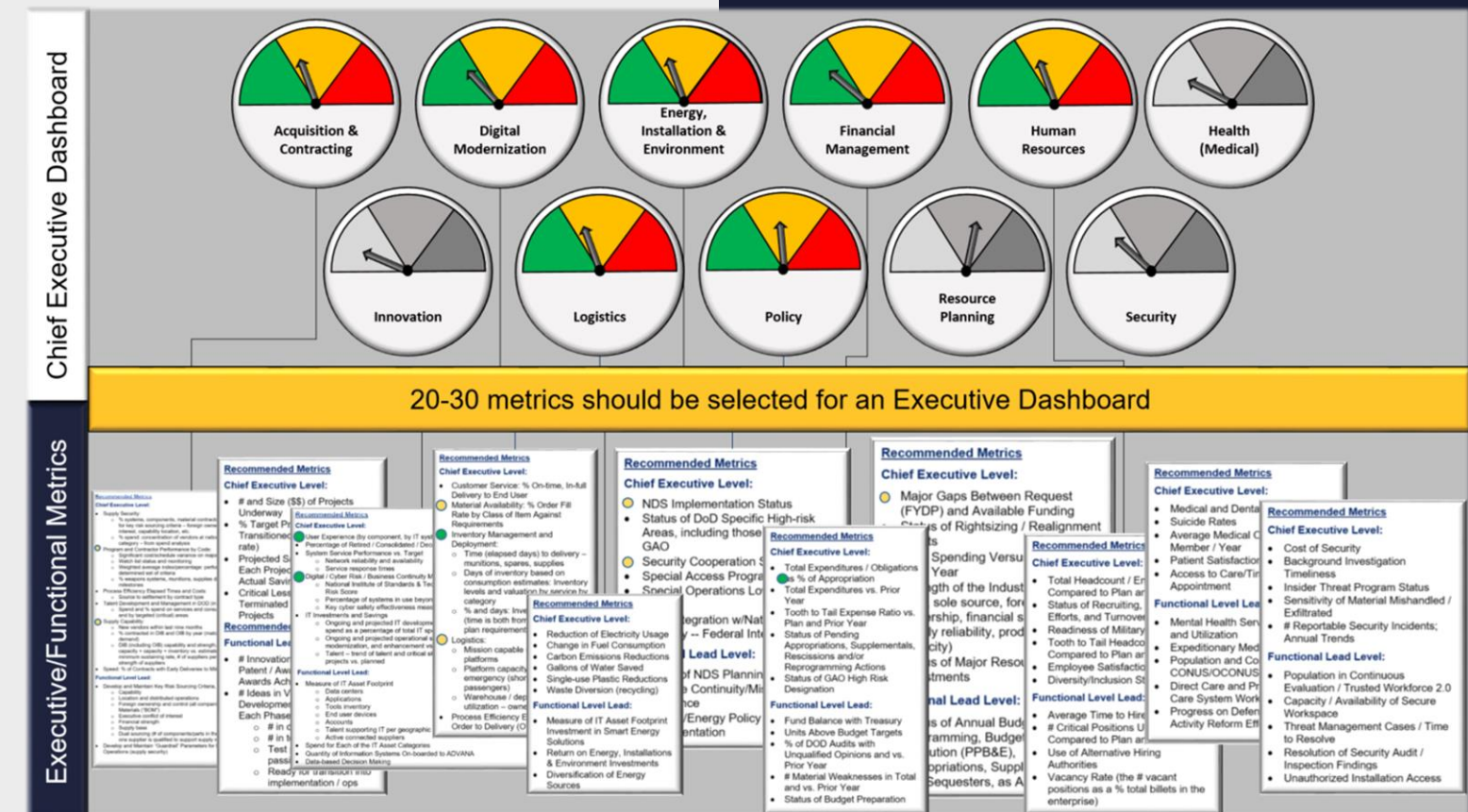
- C-Suite executives rely on metrics to run their organizations
 - Metrics must be timely, reliable, standardized, balanced, & data-driven
 - Used to drive progress & make decisions
 - Should be kept to an “essential minimum”
- Innovation
 - Appreciates innovative thinking, but “innovation metrics” are not common
 - Ideas must be aligned with strategy
- Red Metrics
 - Are focus areas for improvement
 - Repeated failure is met with accountability



V. Recommended Metrics for the Next Generation

08

- The following slides depict recommended metrics by functional area
- An objective individual should be appointed to select which to implement
 - Selection should not be limited by data availability
- Intent is that metrics “roll up” to a composite view
- 20-30 should be selected for an Executive Dashboard
 - May not always include every functional area
 - May change over time



Executive Level Metrics

- Major Variances from Current NDS
- Major Variances from War Plans, including Positioning and Readiness of Forces, Platforms, and Munitions
- Status of DoD Specific High-risk Areas as Identified by GAO
- Security Cooperation Status
- Status of Rightsizing / Realignment Efforts
- Status of Performance Management System

Functional Level Metrics

- Status of NSS / NDS Planning
- Defense Continuity/Mission Assurance
- Special Operations Low Intensity Conflict

The symbols indicate examples of Leading (*) and Lagging (^) indicators; however, it is not all inclusive.



Executive Level Metrics

- Supply Security
 - % systems, components, material contractors who have been assessed for key risk sourcing criteria
 - % spend: concentration of vendors at national level & number of vendors by category*
- Program & Contractor Performance by Code
 - Significant cost / schedule variance on major acquisition programs
 - Watch list status & monitoring
 - Weighted average index / %: performance by vendor by pre-determined set of criteria
 - % weapons systems, munitions, supplies delivery performance to milestones*
- Process Efficiency Elapsed Times and Costs
 - Source to settlement by contract type
- Talent Development and Management in DOD
 - Spend & % spend on services & consultancy contractors by service / targeted areas
- Supply Capability
 - New vendors selected for onboarding in last nine months*
 - % contracted in DIB and OIB by year*
 - DIB (including OIB) capability and strength, % by category^
- Speed
 - % Contracts with Early Deliveries to Milestones^

Functional Level Metrics

- Develop and Maintain Key Risk Sourcing Criteria, including Supply Security
 - Capability
 - Location and distributed operations
 - Foreign ownership and control
 - Executive conflict of interest
 - Financial strength
 - Supply base
 - Dual sourcing
- Develop and Maintain “Guardrail” Parameters for Private, DOD, and NGO Operations (supply security)

The symbols indicate examples of Leading (*) and Lagging (^) indicators; however, it is not all inclusive.



Executive Level Metrics

- User Experience vs. Target[^]
- Percentage of Retired / Consolidated / Decommissioned Systems vs. Target*
- System Service Performance vs. Target*
 - Network reliability and availability
 - Service response times
- Digital / Cyber Risk / Business Continuity Measures
 - National Institute of Standards & Technology Cyber Risk Score
 - % systems in use beyond end-of-life/support
 - Key cyber safety effectiveness measures: system recovery timelines
- IT Investments and Savings
 - Ongoing and projected IT development, modernization, and enhancement spend as a percentage of total IT spend
 - Ongoing and projected operational savings resulting from IT development, modernization, and enhancement vs. target
 - Talent – trend of talent and critical skills

Functional Level Metrics

- Measure of IT Asset Footprint
 - Data centers
 - Applications
 - Tools inventory
 - End user devices
 - Accounts
 - Talent supporting IT per geographic location
 - Active connected suppliers
- Spend for Each of the IT Asset Categories
- Quantity of Information Systems On-boarded to ADVANA*

The symbols indicate examples of Leading (*) and Lagging (^) indicators; however, it is not all inclusive.



Executive Level Metrics

- Climate / Energy Plan Implementation (plan / actual)
- Reduction of Electricity Usage
- Change in Fuel Consumption
- Carbon Emissions Reductions[^]
- Gallons of Water Saved
- Single-use Plastic Reductions
- Waste Diversion (recycling)

Functional Level Metrics

- Measure of IT Asset Footprint
Investment in Smart Energy Solutions
- Return on Energy, Installations and
Environment Investments*
- Diversification of Energy Sources

The symbols indicate examples of Leading (*) and Lagging (^) indicators; however, it is not all inclusive.



Executive Level Metrics

- Total Expenditures / Obligations as % Appropriation*
- Total Expenditures as % of Appropriations vs. Prior Year^
- Tooth to Tail Expense Ratio vs. Plan and Prior Year
- Status of Pending Appropriations, Supplemental, Rescissions and/or Reprogramming Actions*
- Status of GAO High Risk Designation

Functional Level Metrics

- Fund Balance with Treasury
- Units Above Budget Targets
- % DOD Audits with Unqualified Opinions and vs. Prior Year
- # Material Weaknesses in Total and vs. Prior Year
- Status of Budget Preparation

The symbols indicate examples of Leading (*) and Lagging (^) indicators; however, it is not all inclusive.



Executive Level Metrics

- Total Headcount / End Strength as Compared to Plan and Prior Year[^]
- Status of Recruiting, Re-enlistment Efforts, and Turnover Rates*
- Readiness of Military Troops
- Tooth to Tail Headcount Ratio Compared to Plan and Prior Year
- Employee Satisfaction Results*
- Diversity/Inclusion Statistics*

Functional Level Metrics

- Average Time to Hire
- # Critical Positions Unfilled Compared to Plan and Prior Year
- Use of Alternative Hiring Authorities
- Vacancy Rate

The symbols indicate examples of Leading (*) and Lagging (^) indicators; however, it is not all inclusive.



Executive Level Metrics

- Medical and Dental Readiness
- Suicide Rates[^]
- Average Medical Cost Per Member / Year
- Patient Satisfaction
- Access to Care / Time to Appointment

Functional Level Metrics

- Mental Health Services Availability and Utilization*
- Expeditionary Medical Support
- Population and Cost by Category; CONUS/OCONUS
- Direct Care and Private Sector Care System Workload
- Progress on Defense Health Activity Reform Efforts

The symbols indicate examples of Leading (*) and Lagging (^) indicators; however, it is not all inclusive.



Executive Level Metrics

- # and Size (\$\$) of Projects Underway*
- % Target Projects that Transitioned Into Use^
- Projected Savings / Benefit of Each Project vs. Target vs. Actual Savings / Benefit
- Critical Lessons Captured from Terminated and Completed Projects

Functional Level Metrics

- # Innovations Submitted for Patent / Awards vs. Patent / Awards Achieved
- # Ideas in Various Phases of Development and \$\$ Spent in Each Phase:
 - # in development
 - # in test
 - Test pass % and rate of passing
 - Ready for transition into implementation / ops
- # Employees / Teams Recognized for Innovative Results
- # Ideas that Achieved Intended Savings / Benefit
- # External Partners / Suppliers Supporting Innovation

The symbols indicate examples of Leading (*) and Lagging (^) indicators; however, it is not all inclusive.



Executive Level Metrics

- Customer Service: % On-time, In-full Delivery to End User*
- Material Availability: % Order Fill Rate by Class of Item Against Requirements
- Inventory Management and Deployment
 - Time to delivery – munitions, spares, supplies*
 - Days of inventory based on consumption estimates: Inventory levels and valuation by service by category*
 - % and days: Inventory ageing
- Logistics Process
 - Mission capable status of logistics platforms^
 - Platform capacity for normal and emergency
 - Warehouse / depot capacity utilization
- Process Efficiency Elapsed Times: Order to Delivery (OTD) to End User

Functional Level Metrics

- Mental Health Services Availability and Utilization*
- Customer Service: by Category and Region, Weapons Systems, Munitions, Spares
 - % delivered on-time, in-full
 - Order and request response time
- Inventory Management by Weapons Systems, Category, Service
 - Material availability to customer request
 - Backorders, quality-defect free shipments
 - Stock outs by category and region
 - Pre-positioning status (troops, systems, and stockpiles)
 - Inventory levels/valuation by region, category, type
 - Inventory ageing by category, type
- Logistics Process
 - Mission capable status of logistics platforms
 - Platform capacity for normal and emergency
 - Warehouse/depot capacity and utilization by region, service
 - On-time delivery performance
 - Vehicles and equipment utilization rate
 - Time definite delivery



The symbols indicate examples of Leading (*) and Lagging (^) indicators; however, it is not all inclusive.

Executive Level Metrics

- Major Gaps Between Request (FYDP) and Available Funding[^]
- Status of Rightsizing / Realignment Efforts
- R&D Spending Versus Budget and Prior Year
- Strength of the Industrial Base
- Status of Major Resource Investments*

Functional Level Metrics

- Status of Annual Budget, Planning, Programming, Budgeting, & Execution (PPB&E), Appropriations, Supplemental, and Sequesters, as Applicable
- Resources Against Current Strategy vs. Resources Against Future Strategy
- Status of Resource Planning Process
- % Resource Planning Projects On / Off Track
- Status of Execution of Key Resource Allocation Projects
- Status of Meeting Supply Commitments to Allies and Partners
- Congressional Marks Review



The symbols indicate examples of Leading (*) and Lagging (^) indicators; however, it is not all inclusive.

Executive Level Metrics

- Enterprise Cost of Personnel & Physical Security
- Background Investigation Cost / Timeliness
- Special Access Programs Oversight Plan / Actual
- Insider Threat Program*
- Sensitivity of Material Mishandled / Ex-filtrated^
- # Reportable Security Incidents; Annual Trends

Functional Level Metrics

- Population in Continuous Evaluation / Trusted Workforce 2.0
- Capacity / Availability of Secure Workspace
- Threat Management Cases / Time to Resolve
- Resolution of Security Audit / Inspection Findings
- Unauthorized Installation Access

The symbols indicate examples of Leading (*) and Lagging (^) indicators; however, it is not all inclusive.



Key Recommendations for Improvement

1. Governance

The DOD should ensure the governance body for business health metrics includes representatives outside of the group responsible for determining and delivering on such metrics.

2. Transformational Leadership

The Secretary / Deputy Secretary should consider creating a separate and independent Performance Improvement Officer.

3. Resourcing

The DOD should develop a resourcing model that enables it to assess the performance of the Components as well as the Enterprise.

4. Reporting Culture

DOD Senior Leadership must publicly and consistently celebrate those who report the status of projects objectively and fairly.

5. Decision Making

DOD leaders should insist that all meetings use live electronic data from approved data pools, with decisions made based on this data.

6. Standardizing Data & Codifying Requirements

Once it has identified the metrics of the future, the DOD should publish updates to their functional instructions to formalize data requirements in DOD instruction.

7. Change Management Study

The Deputy Secretary should direct the DBB to conduct a study on how to improve the business culture of the Department.

8. Metrics

The Deputy Secretary should empower an independent individual to review each recommended metric with the appropriate subject matter experts for consideration and implementation.

9. Data

The individual appointed by the Deputy Secretary to select metrics from this report should not reject proposed indicators simply due to lack of data. If the DOD does not currently have the data available to provide the recommended metrics, it should take steps to fill the related gaps.

10. Leading & Lagging Indicators

The individual appointed by the Deputy Secretary to select metrics should consider adopting leading and lagging indicators to properly measure the DOD's business functional areas.



Conclusions



- Developing metrics is a daunting task
- Solid foundation in place, still work to do
- Metrics programs are dynamic; need steady resources & leadership to achieve their potential
- Critical to DOD achieving its ultimate objective

Like military operations, business operations must be measured through objectives and goals to ensure success..



Appendix C – Subcommittee Member Biographies

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ERIN HILL

CHIEF ADMINISTRATIVE OFFICER, BNY MELLON

Erin Hill is a Deputy Chief Officer within Internal Audit at BNY Mellon. Erin oversees the audit program for Clearing and Collateral Management, Pershing, Markets, Treasury Services, Market and Credit Risk, Credit Risk Review, Global Client Management, Marketing and Communications.

Erin previously was BNY Mellon's Chief Administrative Officer, where she led Real Estate, Procurement, Third Party Governance, Real Estate, Aircraft, all other Corporate Services and certain enterprise-wide legal, compliance and regulatory initiatives. Erin led the global CAO Roundtable, a forum of chief administrative offices across the company, ensuring alignment on firm-wide priorities and communications. Erin joined BNY Mellon in January 2018.

Prior to joining BNY Mellon, Erin spent 13 years at JPMorgan Chase & Co. in a number of senior roles. Most recently, Erin was the Head of Consumer Branch Banking and Wealth Management, leading the firm's 5,500 retail branches and 50,000 bankers and financial advisors. Previous roles at JPMorgan included Chief Administrative Officer of the Consumer Bank, Chief Operating Officer of Legal & Compliance, and Chief Financial Officer of JPMorgan's private equity business. Erin was also a corporate attorney with Wachtell, Lipton, Rosen & Katz, specializing in corporate governance and acquisitions. Erin was the finance director at Tishman Speyer Properties, an international real estate developer, leading significant real estate acquisitions, including Rockefeller Center. Erin started her career at Arthur Andersen & Co., a public accounting firm.

Erin earned her law degree from Columbia Law School, an MBA from Columbia Business School and is a certified public accountant. Erin also has her Series 24, 7, 9, 10 and 66.



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THE HONORABLE DAVID M. WALKER FORMER U.S. COMPTROLLER

Mr. Walker is a nationally and internationally recognized fiscal responsibility, government transformation/accountability, human capital, and retirement security expert. He has over 40 years of executive level experience in the public, private and non-profit sectors, including heading three federal agencies, two non-profits, and serving as Comptroller General of the United States and CEO of the U.S. Government Accountability Office (GAO) for almost 10 year.

Mr. Walker is also a writer, speaker and media commentator. He has authored three books, the latest was entitled *Comeback America: Turning the Country Around and Restoring Fiscal Responsibility* (2010), which achieved National Bestseller status, and he plans to publish a fourth book in 2021. He has appeared in several major programs and documentaries, including being the primary subject in a 60 Minutes segment and the critically acclaimed documentary *I.O.U.S.*

Mr. Walker is currently the Distinguished Visiting Professor (William J. Crowe Chair) at the U.S. Naval Academy where he teaches the Economics of National Security. Previously, he served as a Senior Strategic Advisor for PwC's Public Sector Practice (now Guidehouse). Mr. Walker was the Founder, President and CEO of the Comeback America Initiative (CAI). In this capacity he led CAI's efforts to promote fiscal responsibility and sustainability by engaging the public and assisting key policymakers on a non-partisan basis to help achieve solutions to America's federal, state and local fiscal imbalances. During this period, he conducted a nationally recognized Fiscal Responsibility Solutions Tour that covered 10,000 miles and included 27 states plus D.C.

Prior to founding CAI, Mr. Walker served as the first President and CEO of the Peter G. Peterson Foundation that promotes fiscal responsibility. Previously, he served as the seventh Comptroller General of the United States and head of the U.S. Government Accountability Office (GAO) for almost ten years (1998-2008). GAO conducts financial, performance and compliance audits, a range of policy and operational research and analyses, promulgates Generally Accepted Governmental Auditing Standards, and renders decisions on bid protests on federal contract.

Under Mr. Walker's leadership, GAO underwent a dramatic and highly successful transformation which, among other things, resulted rightsizing the agency, significantly increasing its visibility, credibility and productivity, and achieving over \$380 billion in financial benefits and many other non-financial benefits over a 10-year period.



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Mr. Walker's appointment as Comptroller General was one of his three presidential appointments each by different Presidents (i.e., Reagan, Bush 41, and Clinton) during his 16 years of total federal service. He was confirmed unanimously by the U.S. Senate for all three of his Presidential appointments. His previous Presidential appointments were Assistant Secretary of Labor for the current Employee Benefit Security Administration, and as one of two Public Trustees for Social Security and Medicare. Mr. Walker also served as Acting Executive Director, Deputy Executive Director and Chief Negotiator for the Pension Benefit Guaranty Corporation. He also has over 20 years of private sector experience, including approximately 10 years as a Partner and Global Managing Director of the Human Capital Services Practice for Arthur Andersen LLP. His initial private sector experience was with Price Waterhouse & Co., Coopers & Lybrand and Source Services Corporation.

Mr. Walker currently serves on various boards and advisory groups, including as Chairman of the Government Transformation Initiative Board, as a member of Advisory Committees for Institute for Truth in Accounting, the Center for the Study of the Presidency the Congress, the Center for State-led National Debt Solutions, and the Peter G. Peterson Foundation. He previously served as Chairman of the Independent Audit Advisory Committee (IAAC) for the United Nations, Chairman of the U.S. Intergovernmental Audit Forum, and as a member of the Board of Directors for the International Organization of Supreme Audit Institutions, AARP, the Committee for a Responsible Federal Budget, the Partnership for Public Service, and the Connecticut Municipal Accountability Review Board. He is also a past member of the Trilateral Commission.

Mr. Walker is an inductee in the Accounting Hall of Fame, the Internal Audit Hall of Fame, the National Academy of Public Administration, and the National Academy of Social Insurance. In addition, he is a member of and has held various leadership positions in Rotary International and the Sons of the American Revolution (SAR). Mr. Walker is a non-practicing CPA who has a B.S. in Accounting from Jacksonville University, an SMG Certificate from the JFK School of Government at Harvard University, a Capstone Certificate from the National War College, and four honorary doctorate degrees from American University, Bryant University, Jacksonville University and Lincoln Memorial University. He has won numerous national and international leadership, professional, and public service awards, including top awards from two heads of state (i.e., Austria and Indonesia) and two U.S. Cabinet Secretaries (i.e., Defense and Labor), the top award for his CPA profession (i.e., AICPA Gold Medal), and the first and only Alexander Hamilton Award for economic and fiscal policy leadership from the Center for the Study of the Presidency and the Congress.



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CRAIG ALBRIGHT

CFO, XEROX AMERICAS OPERATIONS & GLOBAL CASH CENTER OF EXCELLENCE

CFO for Xerox Americas Operations and Global Cash Center of Excellence, and before this Commercial Finance Executive responsible for Global Technology, Services, Software and Commercial activities. Craig 's broad experiences as CFO for various operating units, across global offerings and as corporate strategist uniquely position him as a finance leader who serves as a trusted partner to Corporate and Operating executives to drive value creating business and investment decisions.

Prior to this Craig was CFO, Xerox Europe from 2010 to 2012 during the Eurozone crisis and before that VP Finance for Xerox North America Managed Print Services. Craig joined Xerox in 2004 as Director Corporate Strategy Integration working with the Management Committee on setting the corporate agenda and leading strategic planning and market intelligence. Prior to joining Xerox, Craig was a Senior Manager at Marakon Associates, a management consulting firm, providing Fortune 500 clients with support on business strategy, performance improvement and organizational design.

Before earning his MBA from Wharton, Craig began his career at Deloitte as a Business Analyst. He has a BS in Mathematics from the University of Chicago.

Specialties: Business Transformation; Growth Strategies; Business Valuation; Performance Management & Reporting; Services Risk Management and Controls; Shared Services management.



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CHRISTOPHER S. GOPAL, PH.D. **EXECUTIVE, CONSULTANT. AUTHOR. & EDUCATOR,** **GLOBAL SUPPLY CHAIN & OPERATIONS**

Dr. Gopal has over 35 years of experience in global supply chain and operations strategy, execution, and technology in a career that has encompassed industry executive management and consulting. His experience has focused on innovating, structuring, improving, and managing supply chain operations, business processes, services, and technology use for leading global companies.

For products companies, this has included developing innovative supply chain, customer life cycle experience and information strategies on a global basis, cost reduction, risk mitigation, stabilizing and improving operational efficiency, and executing for world-class results. In the services arena, Dr. Gopal has built and run world-class professional services and consulting practices for major companies, consulted in supply chain strategy, management and technology with leading global companies, and has developed technology solutions, innovative new services in accelerated strategy and process design, and executive education programs for both large global and small companies.

Dr. Gopal has held executive positions at several leading companies, including VP, World Wide Operations and Services at Overland Storage, VP in World-Wide Operations at Dell Computer, Partner & Director of Global Supply Chain & Operations services at Ernst & Young Consulting, as well as executive VP positions at Unisys and SAIC. His consulting clients have included prominent global companies across a range of industries, and he has served as an executive and consultant for several major companies and consultancies.

Dr. Gopal is a recognized thought leader in the field of global supply chain & operations. He is the co-author of three books, the latest being "Supercharging Supply Chains: Creating Shareholder Value through Operations Excellence" John Wiley & Sons; (Now published in Japanese), has authored several articles and is an invited speaker at numerous international business conferences for Business Week, Defense Logistics Agency, the Harvard Business Review, the Milken Institute Global Forum and the Council for Supply Chain Management Professionals, among others. He has been nominated to the SC Digest 2020 "Supply Chain Gurus" panel, and was also a member of the 2015-2019 panels. He has served as an advisor and board member to leading-edge technology companies, including a leading corporate social responsibility platform company, and has assisted Zin several startups. Dr. Gopal served as an advisor to a prominent think tank project in Washington



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on Industrial Competitiveness, and recently served on a White House sub-committee on Manufacturing Technologies.

Dr. Gopal currently is a strategic advisor to OCX Cognition, a company that consults and develops software to integrate and organize the Integrated Supply Chain and Customer Life Cycle Experience. Chris consults with companies in supply chain & operations, risk mitigation, e-business, technology and solutions development. He teaches at the University of California San Diego and the University of Southern California. Chris serves on the Advisory Board of the Global Supply Chain Management Center at the University of Southern California. He holds a Ph.D. in Business from the University of Southern California, an MBA from the Cranfield School of Management, UK, and a B.Sc. in Physics, Science and Mathematics from Bangalore University, India.



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LINNIE M. HAYNESWORTH FORMER VP NORTHROP GUNMAN & INDEPENDENT BOARD DIRECTOR

Ms. Haynesworth serves as a board director on three public company boards where she sits on the Audit, Technology and Governance and Sustainability committees.

Linnie also serves on non-profit boards including the Fairfax County Economic Development Authority (FCEDA) Commission, the Flint Hill School Trustees. She has also served on the boards of the Northern VA Technology Council, and the Intelligence & National Security Alliance (Audit Committee).

Ms. Haynesworth is a highly regarded operational leader with an extensive background in technology integration, cybersecurity risk management, strategic planning and large complex software-intensive system development, delivery and deployment to US government and international customers. With P&L operational responsibility for multiple \$1B+ divisions, she retired in 2019 as the Sector Vice President and General Manager of the Cyber and Intelligence Mission Solutions Division for Northrop Grumman Corporation's (NGC) Mission Systems Sector. Linnie also led Engineering, Supply Chain and Product Development functions for the NGC space sector.

Ms. Haynesworth received her BS in Electrical Engineering from the University of Southern California (USC) and is the 2019 recipient of the USC Viterbi School of Engineering Mark A. Stevens Distinguished Alumni Award.



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MELLODY HOBSON

CO-CEO & PRESIDENT, ARIEL INVESTMENTS

As Co-CEO of Ariel Investments, Melody is responsible for management, strategic planning and growth for all areas of Ariel Investments outside of research and portfolio management.

Additionally, she serves as Chairman of the Board of Trustees of the Ariel Investment Trust—the company’s publicly traded mutual funds. Prior to being named Co-CEO, Melody spent nearly two decades as the firm’s President.

Outside of Ariel, Melody is a nationally recognized voice on financial literacy. Her leadership has also been invaluable to corporate boardrooms across the nation. She currently serves as Chair of the Board of Starbucks Corporation. She is also a director of JPMorgan Chase. She previously served as Chairman of the Board of DreamWorks Animation until the company’s sale and was also a long-standing board member of the Estée Lauder Companies.

Melody’s community outreach includes her role as Chairman of After School Matters, a Chicago non-profit that provides area teens with high-quality after school and summer programs. Additionally, she is vice chair of World Business Chicago; co-chair of the Lucas Museum of Narrative Art; and a board member of the George Lucas Education Foundation and Bloomberg Philanthropies. She also serves on the board of trustees of the Center for Strategic & International Studies, and of the Los Angeles County Museum of Art (LACMA).

Melody is a member of the American Academy of Arts and Sciences, The Rockefeller Foundation Board of Trustees, and serves on the executive committee of the Investment Company Institute.

Melody earned her AB from Princeton University’s Woodrow Wilson School of International Relations and Public Policy. In 2019, she was awarded the University’s highest honor, the Woodrow Wilson Award, presented annually to a Princeton graduate whose career embodies a commitment to national service. She has also received honorary doctorate degrees from Howard University, Johns Hopkins University, St. Mary’s College, and the University of Southern California.

In 2015, Time Magazine named her one of the “100 Most Influential People” in the world.



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SUZANNE LEOPOLDI-NICHOLS

CHIEF GLOBAL BUSINESS SOLUTIONS OFFICER, WPP'S GLOBAL PROCUREMENT



Suzanne joined WPP Plc. in July 2021 as Chief Global Business Solutions (GBS) Officer. WPP's global Procurement, Real Estate and Finance Shared Services functions were the initial processes incorporated into the newly formed GBS organization, with HR and IT process to follow.

Immediately prior, Suzanne was President, Global Business Services at United Parcel Service (UPS.) The GBS team comprised 17,000 employees in 97 locations, providing support for Brokerage, Customer Service, Finance, Human Capital, IT, and World Class Sales Support.

Suzanne also held leadership roles at Archer Daniels Midland (ADM), American Greetings, and H&R Block. Suzanne is an Advisory Board Member at IQPC's Shared Services and Outsourcing Network (SSON) and is a Founding Member of The GBS Board.

Suzanne and her teams won multiple awards for their work in GBS including:

- SSON's "Top 20 Most Admired Shared Services"
- UPS's Diversity and Inclusion Champion and Horizon Awards"
- IAOP inducted Suzanne into their Leadership Hall of Fame
- APA's Prism Award for "Overall Best Practices in Management, Process, and Technology"



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DAVID VAN SLYKE, PH.D DEAN, THE MAXWELL SCHOOL OF CITIZENSHIP & PUBLIC AFFAIRS SYRACUSE UNIVERSITY

David M. Van Slyke is Dean of the Maxwell School of Citizenship and Public Affairs at Syracuse University and the Louis A. Bantle Chair in Business-Government Policy. Prior to becoming Dean on July 1, 2016, Van Slyke was Associate Dean and Chair of Maxwell's department of public administration and international affairs. He is a tenured, full professor of the Maxwell School and the College of Arts and Sciences and a two-time recipient of the Birkhead-Burkhead Award and Professorship for Teaching Excellence.

Van Slyke is a leading international expert on public-private partnerships, public sector contracting and contract management, public and nonprofit management, and policy implementation. He was a Director (2016-2021) and is a Fellow (2010-Present) of the National Academy of Public Administration (NAPA) and has been a member of NAPA's Expert Advisory teams for the Office of the Inspector General at the Department of Homeland Security and the U.S. Postal Service. He is a former co-editor of the *Journal of Public Administration Research and Theory* and the *Journal of Strategic Contracting and Negotiation*. He is actively engaged in the Network of Schools of Public Policy, Affairs, and Administration, the Association of Professional Schools of International Affairs, the Volcker Alliance, and the University Leadership Council on Diversity and Inclusion in International Affairs Education. He also sits on the editorial boards of several top-ranked public affairs and nonprofit management journal.

He has provided expert guidance to the Office of Management and Budget, the Government Accountability Office, the U.S. Coast Guard, the Department of Defense, the World Bank, and a range of philanthropic foundations. As part of his executive education teaching and research he has worked extensively with senior leaders in government, nonprofit, and business organizations in China, India, Russia, Singapore, and Thailand. He has been interviewed on and his work cited in CNN, Washington Post, Bloomberg Tax, National Public Radio's Morning Edition, National Public Radio/American Public Media's MarketPlace, CBS News, US News & World Report, Governing, the Capital Pressroom, the Washington Times, Government Executive, InsideDefense, Xinhua Global Times in China, Federal Computer Week, Washington Technology, Defense Industry Daily, Federal News Radio, and GovLoop.



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Van Slyke's book, *Complex Contracting: Government Purchasing in the Wake of the U.S. Coast Guard's Deepwater Program* (Cambridge University Press, 2013) is the recipient of the American Society for Public Administration Section on Research Best Book Award for 2014 and honorable mention for the Public and Nonprofit Section of the Academy of Management best book award for 2016. He is winner of the 2015 Distinguished Alumnus in Public Administration and Policy award from the Rockefeller College of Public Affairs and Policy at the University at Albany, and the 2007 Best Article Award published in the *Journal of Public Administration Research and Theory*. Van Slyke earned a Ph.D. in public administration and policy from the Rockefeller College of Public Affairs and Policy at the University at Albany, State University of New York. Prior to becoming an academic, he worked in the private, public and nonprofit sectors.



DEFENSE BUSINESS BOARD



PATRICIA J. ZARODKIEWICZ PRESIDENT, PATZ CONSULTING LLC

Pat Zarodkiewicz, President, PatZconsulting, LLC, provides national security, organizational dynamics and leadership consulting to private and federal markets. In addition to her consulting, she currently serves on the Aerospace Corporation's Board of Trustees, the Board of Advisors for the Intelligence & Security Academy LLC, and is an advisor to Core4ce, LLC. She is a retired Senior Executive with nearly 34 years of experience in the Department of the Air Force. In her final USAF position as the Administrative Assistant to the Secretary of the Air Force (SAF/AA), she provided advice to the Secretary of the Air Force and Chief of Staff on executive personnel and Headquarters management, and led an organization responsible for over \$5.6 Billion annually, and supported 37,000 people. As the Air Force's Senior Security Official, she led the Air Force's insider threat program, information, personnel and industrial security policy, and provided oversight of Special Access Programs. Pat served as the Acting Under Secretary for five months in 2017 and was the senior transition official for the Air Force. She served as the Chair of the Strategic Planning Committee for the \$6 Million DoD Concessions Committee and was the Chair and Board Member of the Air Force Board of Military Corrections. Prior to her SAF/AA role, Pat served as the Deputy Administrative Assistant to the SECAF and was the Principal Deputy Financial Management and Comptroller for two years. She served as the Deputy Director of the Headquarters Staff. Her previous positions include Deputy for Budget, Assistant Secretary of the Air Force for Financial Management and Comptroller (SAF/FMB), the Deputy Comptroller and Comptroller, HQ Air Force Material Command, and the Director of Budget Investment, SAF/FMBI. Her career includes 20 years of experience in financial management at base, Major Command and Headquarters. Pat was a Distinguished Graduate in 1995 from the Industrial College of the Armed Forces, graduating with a MS in National Resource Strategy and her studies focused on space programs. Pat has a Master of Arts in International Affairs from American University, and a BA in Economics and Political Science from the University of Rochester. She attended the Seminar XXI program at Massachusetts Institute of Technology. Pat's leadership was recognized with two Meritorious Presidential Rank Awards, one Distinguished Presidential Rank Award, the Air Force Exceptional Service award, the Navy Superior Public Service Award and the Army Meritorious Public Service Award.





Appendix D – Contributors List



Contributors List

The Defense Business Board would like to thank the following individuals and organizations for the time they took to contribute knowledge and information in support of this study. Their help is greatly appreciated.

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Appendix E – Bibliography



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Appendix F – Questionnaire and Survey Forms

Background

As the Defense Department continues to explore the benefits of analytics as an element of decision making, it recognizes it cannot do so without the right metrics. Through this survey and study, the Defense Business Board (DBB) will provide recommendations to the Deputy Secretary of Defense on the specific metrics Defense Department leadership should utilize to maximize the effectiveness of business operations. Please respond to the following survey questions to help the DBB formulate its recommendations.

Survey Questions

1. What are the top 5 metrics your senior service or agency leaders use to determine the health in each of the functional areas listed below? **If there are no metrics used in any given area, or the area doesn't apply indicate that.** Please include any underlying definitions of the metrics to aid our understanding.

- a. Acquisition and Contracting
- b. Digital Modernization and Information Technology (Including the IT user experience)
- c. Energy, Installation, and Environment (Including Real Estate/Facilities)
- d. Financial Management
- e. Human Resources
- f. Health (Medical)
- g. Innovation
- h. Logistics
- i. Policy
- j. Resource Planning
- k. Security

2. Do you benchmark any of the metrics identified in the business areas above against other like metrics? If so, how? (e.g. perhaps your healthcare function uses the same patient experience survey as other private/public hospitals and can benchmark against national/regional performance scores)

3. If there are other metrics you'd like to track but don't, what are the barriers/challenges to doing so? (It requires data that isn't available today? Data accuracy/quality concerns? Fear of reprisal?)

4. Is your organization comfortable with red metrics – especially when they are new and stretching boundaries? Would your organization be willing to “go red” to try new things and sometimes fail?

5. Do you believe that DoD's culture to avoid red metrics impacts its ability to experiment and innovate? How do you suggest it changes to undo the stigma of red metrics?

6. Outside the scope of this study, what are some other business challenges or issues you'd like to see the Defense Business Board study?

Greetings,

The Deputy Secretary of Defense has tasked the Defense Business Board with a study to identify the key performance metrics/indicators that C-suite leaders use to manage their organizations. We would appreciate your participation/input.

The mission of the Department of Defense is to deter and win wars – different than in private industry, which is focused on creating value to investors and the bottom line.

Despite the differences, there are many areas where the Department could benefit from a private sector approach. *That's the crux of this study, and why your help is so important.* The more efficient and effective the Department of Defense can be in conducting business, the more resources that can be used for its true mission.

ASK:

- 1. Provide the top 5-7 aggregated key performance indicators/metrics that your CEO/COO use to manage by September 14, 2022.**
- 2. Provide the top 5-10 key performance indicators/metrics used by other functional C-suite executives to manage their organizations by September 14, 2022.**
- 3. What are the metrics you wish you had but don't?**

Ideally the information you provide is focused on areas that DoD has in common with private industry including human resources/talent management, acquisition/contracting, supply chain/logistics, real estate/facilities/environment, etc... You can send the information in any form. We ask that if there are underlying definitions to include them if possible to make application to DoD easier.

Attribution: *The information you provide will not be associated with your organization. The only association will be if you agree to be listed as an interviewee.*

Thank you again for your participation in service to your country. Should you have any questions please feel free to contact me and we can schedule a short call.



Appendix G – Public Comments



Public Comments

No comments were received from members of the public during the open public session on November 10, 2022.



Appendix H - Acronyms

ADVANA	Advancing Analytics
APP	Annual Performance Plan
APR	Annual Performance Report
BOD	Board of Directors
BOM	Bill of Material
CEO	Chief Executive Officer
CDAO	Chief Data and Artificial Intelligence Office
CONUS	Continental United States
COVID-19	Coronavirus Disease 2019
DAFA	Defense Agencies and Field Activities
DBB	Defense Business Board
DIB	Defense Industrial Base
DMAG	Deputy's Management Action Group
DOD	Department of Defense
DSD	Deputy Secretary of Defense
DWC	Deputy's Workforce Council
EBITDA	Earnings Before Interest Taxes, Depreciation Amortization
FYDP	Future Year Defense Program
GAO	Government Accountability Office
GPRAMA	Government Performance & Results Modernization Act of 2010
IAPR	Integrated Acquisition Portfolio Reviews
IT	Information Technology
KPI	Key Performance Indicator
NDS	National Defense Strategy
NGO	Non-governmental Organization
OCONUS	Outside the Continental United States
OIB	Organic Industrial Base
OSD	Office of the Secretary of Defense
OTD	Order to Delivery
PIO	Performance Improvement Officer
PPB&E	Planning, Programming, Budgeting, & Execution (PPB&E)
PRC	People's Republic of China
R&D	Research and Development
RDT&E	Research Development Test and Evaluation



RFI	Request For Information
SD	Secretary of Defense
SMP	Strategic Management Plan
TOR	Terms of Reference
USA	U.S. Army
USAF	U.S. Air Force
USC	United States Code



Appendix I – Implementation “Road Map”

The following is a notional guide to implement the recommendations identified in this Report. The steps are ordered based on logical sequencing as well as the assumed magnitude of the change / length of time to enact. Some steps can be implemented in parallel.

1. Identify and empower an individual to review and select metrics for implementation within ADVANA. **(Table 1, Recommendations 8, 9, and 10)**
2. Direct the appropriate PSAs to revise the DOD Instructions and Directives for each of the applicable functional areas to levy data requirements on the Components to populate the selected metrics. **(Table 1, Recommendation 6)**
3. Direct the appropriate governance body review its charter, guidance, and membership to ensure business health metrics are developed and curated transparently, based on customer needs. **(Table 1, Recommendation 1)**
4. Direct OSD PSAs to evaluate their workforce needs to analyze enterprise metrics to assess performance. **(Table 1, Recommendation 3)**
5. Continue, re-start, or begin use of ADVANA metric visualizations in all Senior Department decision-making forums. **(Table 1, Recommendation 5)**
6. Charge the appropriate governance body with developing a method to recognize and celebrate the Components, teams, or individuals who embody transparency and objectivity in the metrics program. **(Table 1, Recommendation 4)**
7. Task the Defense Business Board to study and provide recommendations on how to implement a change management process to improve culture within DOD business functions. **(Table 1, Recommendation 7)**
8. Consider creating a separate and independent PIO. **(Table 1, Recommendation 2)**