ARL-CR-0877 ● AUG 2024

Research Business Directorate Quick-Turn Assessment and Recommendations

prepared by Christopher Zember
Oak Ridge Associated Universities
100 Orau Way
Oak Ridge, TN 37830

NOTICES

Disclaimers

The findings in this report are not to be construed as an official Department of the Army position unless so designated by other authorized documents.

Citation of manufacturer's or trade names does not constitute an official endorsement or approval of the use thereof.

Destroy this report when it is no longer needed. Do not return it to the originator.

ARL-CR-0877 ● AUG 2024

Research Business Directorate Quick-Turn Assessment and Recommendations

prepared by Christopher Zember
Oak Ridge Associated Universities
100 Orau Way
Oak Ridge, TN 37830

under contract W911NF-24-2-0066

REPORT DOCUMENTATION PAGE

1. REPORT DATE	2. REPORT TYPE	3. DATES COVERED	
		START DATE	END DATE
August 2024	Contractor Report	12/31/2023	3/22/2024

4. TITLE AND SUBTITLE
Research Business Directorate Quick-Turn Assessment and Recommendations

5a. CONTRACT NUMBER	5b. GRANT NUMBER	5c. PROGRAM ELEMENT NUMBER
W911NF-24-2-0066		
5d. PROJECT NUMBER	**5e. TASK NUMBER**	**5f. WORK UNIT NUMBER**

6. AUTHOR(S)
Christopher Zember

7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)

Oak Ridge Associated Universities
100 Orau Way
Oak Ridge, TN 37830

8. PERFORMING ORGANIZATION REPORT NUMBER

9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)	10. SPONSOR/MONITOR'S ACRONYM(S)	11. SPONSOR/MONITOR'S REPORT NUMBER(S)
DEVCOM Army Research Laboratory ATTN: FCDD-RLB-R Aberdeen Proving Ground, MD 21005		ARL-CR-0877

12. DISTRIBUTION/AVAILABILITY STATEMENT
DISTRIBUTION STATEMENT A. Approved for public release: distribution unlimited.

13. SUPPLEMENTARY NOTES

14. ABSTRACT
The US Army Combat Capabilities Development Command (DEVCOM) Army Research Laboratory's (ARL's) Research Business Directorate (RBD) is tasked with creating and operating a business enterprise that enables ARL to achieve its mission of operationalizing science at the speed of relevance. Inherent in this is the need to balance the "tyranny of the urgent" with an expeditionary vision and culture that is both outward-looking and forward-leaning. This report highlights several challenges to this imperative, along with corresponding opportunities and recommendations to maximize RBD's effectiveness in achieving its mission, while supporting ARL's overarching mission.

15. SUBJECT TERMS
leadership and organizational development, workforce development, labor and employee relations, civilian personnel management, business management, innovation

16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES
a. REPORT	b. ABSTRACT	C. THIS PAGE		
UNCLASSIFIED	UNCLASSIFIED	UNCLASSIFIED	UU	20

19a. NAME OF RESPONSIBLE PERSON	19b. PHONE NUMBER *(Include area code)*
Christopher Zember	(202) 746-8688

STANDARD FORM 298 (REV. 5/2020)
Prescribed by ANSI Std. Z39.18

Contents

List of Tables

1. Introduction

The US Army Combat Capabilities Development Command (DEVCOM) Army Research Laboratory's (ARL's) Research Business Directorate (RBD) is tasked with creating and operating a business enterprise that enables ARL to achieve its mission of operationalizing science at the speed of relevance. Inherent in this is the need to balance the "tyranny of the urgent" with an expeditionary vision and culture that is both outward-looking and forward-leaning. As the Army's sole foundational research laboratory focused on cutting-edge scientific discoveries, technological innovation, and transitioning capabilities for the future Army, the majority of the ARL workforce is composed of scientific and technological experts. However, whether operating inside a government organization or a private-sector enterprise, the business of research is essential to both its effective execution and its ability to impact future operations. Innovation is not limited to the domain of scientists and engineers; research clearly shows that it is "operational innovation" (i.e., innovation within business operations functions such as human resources, finance, contracting, security, and the like) that is the determining factor in whether technological innovation ever leaves the lab bench. Even within the lab it is operational innovation that enables scientists to focus on their areas of expertise (instead of being encumbered or hindered by ineffective business operations) and thereby facilitates technological discovery. RBD must be focused on delivering this operational innovation.

This report highlights several challenges to this imperative, along with corresponding opportunities and recommendations to maximize RBD's effectiveness in achieving its mission, while supporting ARL's overarching mission. Key recommendations are as follows:

1) Establish a biweekly sync meeting between RBD leadership and the leadership of the other two ARL Directorates (Army Research Directorate [ARD] and Army Research Office [ARO]), at the Director or Deputy Director level.

2) Expand resources (personnel and funding) dedicated to data science and analysis at the enterprise level.

3) Create an overarching contract or agreement that enables rapid funding of new research (maximum 60 days from initiation to funding execution).

4) Launch a Research Business Transformation Cell to pioneer research business transformation, including processes, authorities, and culture.

5) Develop Key Performance Indicators (KPIs) that provide insight and balance the focus on current operations and business transformation objectives, with an emphasis on outcomes instead of outputs.

Additional details on each of these recommendations is provided at the conclusion of this report, incorporating the findings, challenges, and opportunities identified throughout.

2. Background and Objective

In July 2022, ARL reorganized into three directorates: ARO, ARD, and RBD. In January 2024, RBD leadership requested a quick-turn external assessment of the organization and its function in executing ARL's mission under the new organizational structure. The assessment is based on research, and experience with research business management best practices both inside and outside government organizations. The objective of this assessment is to maximize the effectiveness of RBD in achieving its primary purpose: "To create and exploit an expeditionary business enterprise to operationalize science at the speed of relevance."

RBD engaged Mr Christopher Zember to lead this quick-turn assessment and develop an initial set of recommendations for RBD leadership to consider. Mr Zember is a former Defense senior executive, industry executive, and academic research director. In each of these roles, he has overseen large research organizations. In addition, he has advised DOD senior leaders on the formation and organization of other research and innovation offices, including the Defense Innovation Unit and Army Applications Lab. Mr Zember further advised global leaders on research and innovation optimization in the context of the global security environment while serving on the International Security Council of the World Economic Forum.

The purpose of this report is to summarize the findings and recommendations from this initial quick-turn assessment.

3. Approach

RBD commissioned this quick-turn external assessment to be completed with input from the RBD Director, Deputy Director, and Principal Deputies. As such, the methodology included several short meetings with each of these key stakeholders, along with independent research and analysis. A list of RBD focus areas (each led by a Principal Deputy), and the objectives of each of these focus areas, is provided in Table 1 as an excerpt from the RBD Strategy released in November 2023. A list of key personnel interviewed for this report is included in the Appendix.

Table 1 RBD's focus areas

Business analytics	Data governance, spearhead data-driven decision-making model
Corporate information	Digitization, cyber security, and IT customer experience
Laboratory operations	Integrated facilities planning, leverage science and technology (S&T) reinvention laboratory authorities, and military construction
Plan, programs, and budget synchronization	Develop and accelerate utilization of Mission Operations Support System (MOSS), see and understand all resources, exploit financial management tools, and resource management
Regional site synchronization	Cultivate regional talent and capabilities to address ARL's strategic priorities
Research business integration	Internal and external cohesion and alignment of people, processes, technology, resources, data, and partnerships to achieve Army objectives
Strategic partnerships	Identify S&T for the Army of 2040, create and manage partnerships to accelerate operationalization

In addition to meetings with key personnel, research focused on identifying best practices in government research business operations as well as relevant private-sector organizations—from Bell Labs to Google. The Appendix includes a list of publications and other materials used in the development of report. A notable resource was a 2016 Office of Science and Technology Policy study, commissioned by the White House and co-authored by Mr Zember, that examined how national security agencies and departments are postured to harness the opportunities and address the risks of emerging technology and networked talent in each of their mission spaces. The review placed particular emphasis on identifying best practices in human capital, collaboration, and acquisition mechanisms, and identifying additional actions the White House could take to both upgrade capabilities near-term and better position future administrations to contend with the challenges and opportunities they will face. In short, the review not only explored the substantive issues raised by rapidly evolving technologies, but also identified ways the federal government needs to modify its core operations to exploit current technology tools, innovation methods, and communities of practice to better engage with the issues and opportunities raised by emerging technologies and improve the functioning of government in all its tasks.

The books reviewed for this report give information on the leadership, management and cultures of innovative research and development organizations, both inside government and in the private sector (see Appendix). These books were written by organizational psychologists, business experts, or scientists and engineers who also had responsibility for leading research and development organizations.

4. Analysis

RBD's purpose statement, which was defined in Section 2, is forward-looking, focused on continuously optimizing research business operations, while effectively and efficiently managing today's research business organization and processes. This tension between the needs and operations of today versus those of tomorrow is a fundamental challenge for RBD; within this challenge lies the opportunity to excel in ensuring the Army's foundational research laboratory always remains on the cutting edge of not only science but also research business operations.

In its 2023 Strategy document, RBD identified three key challenges:

1) Transforming to data-driven leadership;
2) Building the expeditionary business enterprise for 2040, while addressing the tyranny of the urgent; and
3) Creating a preeminent workforce, while developing and cherishing our most precious asset: our people.

Looking through the lens of these challenges, and in light of existing research and best practices in research business operations, the following are notable observations from discussions with key stakeholders:

- **RBD comprises an exceptional team of experts in their field.**

  ARL's Research Business Directorate is composed of technical experts across a wide range of fields, including finance, contracting, strategy, business, communications, data analytics, information sciences, information technology, facilities management, and security. In addition to expertise in these fields, each office also includes scientific and technical expertise, with staff experienced in bench-level research and possessing PhDs in technical fields. The team brings a substantial combination of experience within ARL together with experience in other government and nongovernmental research institutions. Not only are they experts with a deep and wide range of experiences, but they are highly motivated, passionate, hard-working, and focused on the mission.

- **RBD centralization and standardization are valuable, but also need to account for differences across the broader organization.**

  Within RBD, various business functions such as budgeting and financial management have been centralized. Prior to the 2022 ARL reorganization, many of these functions resided within the technical directorates (which were more numerous at the time), leading to a lack of standardization in

how business functions were executed. As an extension of this absence of an enterprise approach, ARL lacked an enterprise view of many business functions. RBD provides important centralization and standardization to enable enterprise-level insight and management, not only increasing efficiency but also improving effectiveness. Functional staff now have leadership within their career fields, and a clear career path for promotion and professional development. At the same time, RBD should take care that it also continues to account for relevant differences within various ARL offices, such as differences between ARD and ARO. These differences can and should be accounted for in a way that aligns with their unique characteristics, without jeopardizing the value of an enterprise approach.

- **A lack of resources is undermining energy and motivation to improve operations.**

  A consistent message from key stakeholders is that resources are so focused on the status quo that it is starving out the potential to explore better alternative approaches to research business operations. Some good news is that not only is the staff motivated, energized, and full of new ideas, but they are hearing leaders from across ARL asking for them to harness these resources to make improvements. However, they are struggling to find the time and financial resources needed to do so. Alternative approaches need suitable resources (including staff time, room to experiment, and freedom to fail) to bear fruit. Once an alternative approach is proven in a limited pilot form, it needs to be incubated sufficiently so that it can overcome the institutional inertia that tends to prohibit change. The vast majority of these resources can be provided without increasing overall budgets or reducing funding for current operations. In Section 5, Recommendation 3 provides one specific approach that can achieve this.

- **RBD needs to assert its credibility and demonstrate its value across the enterprise.**

  Business functions are often viewed as a "necessary evil" at best and characterized as impediments to effective operations. However, when running well, business functions enable and improve effective operations. As noted earlier, RBD is staffed with experts in their field, just as other ARL directorates comprise experts in the wide range of scientific and technical fields that ARL is leading; it is important and incumbent upon ARL senior leadership (including leadership within each of its three directorates) to communicate and reinforce this message. At the same time, RBD leadership needs to ensure that staff engages with their peers in the other directorates

with a focus on working together. Several sources conveyed that ARD and ARO have too often been told that RBD staff are unavailable as they are busy working on other priorities. Leadership and staff across all three directorates should establish, model, and reinforce a culture and practice of collaboration. This should include regular feedback sessions focused on continuous improvement. Communication is essential to any good relationship; this applies not only to one-on-one personal relationships, but even more so to complex institutional relationships. Frequent and effective communication will also help staff to recognize when issues have been resolved and to leave any past issues in the past, focusing instead on current and future operations and opportunities.

- **In addition to identifying and learning from failures, successes should be recognized and modeled.**

  As important as it is to recognize and learn from failures, effective operations depend on identifying and conveying what "right" looks like. Focusing on failures actually increases chances that these failures will be repeated. Instead, a best practice in management and business operations is to focus on desired behaviors. One of the most effective ways to do this is to clearly and loudly recognize when these behaviors are exhibited. Not only does this help others to see and understand how they should perform, but it creates a psychological and emotional reinforcement that effectively increases the chances that these desirable behaviors will be replicated. ARL leadership, along with leadership of each of its directorates, should focus on identifying and acknowledging successes across the organization, holding those examples up for all to see as a model and motivation for objective performance.

- **A lack of clarity on priorities, paired with an unstructured tasking process, is hampering both efficiency and effectiveness.**

  A frequently heard message is that there is a lot of "churn" within the organization. This comes from an abundance of "taskings" coming from many different places. Staff communicated that they want to be helpful and are reluctant to say no, but do not feel capable of doing so due to a lack of clarity on where to focus, approved tasking channels, and what not to spend time on. As discussed in the following paragraphs, KPIs can help clarify and drive focus on organizational priorities. Without focus, RBD risks being "busier" than it is productive.

"You can't improve what you don't measure." This quote is often attributed to Peter Drucker, and has elicited a range of responses, from admiration to ire.

Measurements that serve as an end in and of themselves waste time and energy and sap an organization's motivation and performance. However, performance measures drive behavior as they provide incentives and focus performance; used effectively, performance measurement can be a tool for effective change and management.

In building an effective performance measurement program, it is important to start with an understanding of the trajectory from data to information, knowledge, and wisdom—as one progresses down this path, each term represents an increase in both context and understanding. Performance measurement should not focus on data alone, but needs to build context and understanding around this data (i.e., it needs to answer the question, "Why? What are the factors that resulted in this data?"). From there, the answer should be translated into actionable recommendations. Performance measures should be established with these points in mind.

Before performance measures can be established, the organization needs to identify clear goals and objectives. Once these are done, performance measures should be developed to serve as KPIs; that is, indicators that let both staff and leadership know whether they are on track to achieve their goals and objectives.

Furthermore, as goals and objectives should strike a balance between current operations and continuous improvement, KPIs should also provide an indication of not only how well the organization is conducting its status quo operations, but also how it is progressing toward a more optimal future state.

For RBD, in addition to establishing its own goals, objectives, and KPIs, it is important to also understand the goals, objectives and KPIs of its sister directorates, and to map how RBD can impact these. In this way, RBD can become integrated into the fabric of performance optimization of ARO and ARD.

5. Conclusion and Recommendations

In summary, RBD is faced with a number of challenges; however, each of these challenges pairs with an opportunity to adapt in alignment with the RBD's purpose (Table 2).

Table 2 RBD's challenges and opportunities

Challenges	Opportunities
• RBD's peer position and expertise not always recognized across the broader organization. • Focus on data-driven lab desired outcomes without resourcing the work to get there. • Emerging partnership opportunities are missed due to lengthy contracting process. • The "tyranny of the urgent" inhibits ability to strategically optimize future business operations. • A proliferation of taskers from all directions undermine ability to focus on strategic priorities.	• Build awareness and recognition of RBD expertise and parity to other directorates. • Provide resources (funding, people) to deliver outcomes; educate staff on the process. • A flexible acquisition vehicle able to accept new work within 60 days would avoid missed opportunities. • Cross-functional teams are best suited to address urgent problems and develop improved operating processes, policies, and culture. • Effective KPIs drive workforce focus and enable leadership insight and decision-making.

Key recommendations are built on the challenge–opportunity pairs in Table 2 as follows:

1) **Establish a biweekly sync meeting between RBD leadership and leadership of the other two ARL Directorates (ARD and ARO), at the Director or Deputy Director level.**

   This biweekly sync meeting serves the practical purpose of ensuring senior-level strategic partnership and communication between RBD, ARD, and ARO. It also serves the strategic purpose of affirming that RBD is coequal with the two technical directorates. This meeting should be focused on identifying any strategic priorities as well as any impediments to effective partnership across the directorates. While ARD and ARO bring scientific and technological expertise, RBD represents research business operations expertise, and is the authoritative voice on the best approach to execute these operations as part of the overall partnership with ARD and ARO. (It should be noted that this relationship is one of coequal partnership, rather than viewing RBD as a support element subordinate to the other directorates.) This meeting should also highlight successes, which the senior leaders can and should then acknowledge directly to the workforce members involved in these (across all three directorates).

2) **Expand resources (personnel and funding) dedicated to data science and analysis at the enterprise level.**

   A data-driven laboratory (under the oversight of data-driven leadership) must operate on the foundation of enterprise data collection, management, analysis, and sharing. Operating without this core capability necessitates a

substantial amount of time spent on collecting and presenting data—at the expense of analysis that informs good decision-making. The responsibility for building a data-driven laboratory falls squarely within the mission of RBD; however, additional resources are needed to achieve this mission. Furthermore, ARL senior leadership (along with the directors of ARD, ARO, and RBD) should affirm and support the centralization of this responsibility within RBD, establishing and managing authoritative data sources along with enterprise tools and processes. RBD Principal Deputies should also ensure that their offices support and align with the element within RBD that is given the lead for this.

3) **Create (an) overarching contract(s) or agreement(s) that enable(s) rapid funding of new research (maximum 60 days from initiation to funding execution).**

   Getting funding for new research efforts is a constant challenge, not only for ARL but across the federal government. Despite the talent and hard work of contracting and agreements' personnel, the process often simply takes too long to meet the timelines needed. Those timelines can be driven by government funding execution deadlines, the pace of commercial business operations, academic calendars, or other factors. To enable contracting to meet the speed of the mission, one or more rapid-execution vehicles is needed that can execute funding within a maximum of 60 days from initiation. There are multiple acquisition approaches that can deliver such a mechanism. By providing this, RBD can demonstrate its technical expertise and value in enabling the work of ARD and ARO, while filling an important existing mission gap.

4) **Launch a Research Business Transformation Cell to pioneer research business transformation, including processes, authorities, and culture.**

   Large institutions have always struggled to balance a forward-looking vision with the need to maintain current operations. A core part of every business school curriculum is analyzing case studies of companies like Kodak, who went out of business because they were so focused on maintaining their current operations that they failed to adapt to changes in the market. Similarly, RBD needs to ensure that it is developing the research business enterprise of the future while simultaneously effectively managing and operating the research business enterprise of today. In both the private sector and other government organizations, a best practice is to establish a transformation cell that leads "sprints" with cross-functional teams focused on solving emerging mission challenges. By defining their mission as

solving the challenge, these teams are able to step away from the "way we've always done it," and develop more optimal approaches. Furthermore, by including representatives from multiple functional offices, this approach exploits the gaps in-between current organizational structures, while also building a practice of teamwork that endures even after the sprint is completed. This approach has consistently proven to be one of the most effective methods of changing organizational culture and building a culture of trust and innovation. Teams should form and operate for as long as is needed to solve the problem, whether that is 6 weeks or 6 months. During their operation, the team should focus exclusively on solving the problem, and should not divide their time between working on the problem and handling their "day job." The Research Business Transformation Cell should have one to three permanent staff whose responsibility is overseeing and supporting the process and operations of these teams, including problem selection, team formation, knowledge capture, and knowledge dissemination. If needed to rapidly kickstart this function, permanent staff can initially be given this responsibility as an additional duty, leveraging current manpower.

5) **Develop Key Performance Indicators (KPIs) that provide insight and balance focus on current operations and business transformation objectives, with an emphasis on outcomes instead of outputs.**

   Organizations tend to measure what is easy to measure, instead of building a metrics program that both drives desired behaviors and provides insight into whether the organization is meeting its objectives. Objectives should be established and measured in terms of outcomes, not simply outputs. For example, counting the number of new cooperative agreements can be useful for administrative purposes; however, it should not serve as a surrogate for assessing to what extent new and existing partnerships are producing their intended results. As RBD establishes its goals and objectives, care should be given to ensure these include the need for effective current operations as well as optimizing and continuously improving these in shaping the research business enterprise of the future. KPIs should be developed to provide insight into whether the organization is meeting, or is on track to meeting, these goals and objectives. They should enable leaders to understand not only whether the organization is performing as intended, but also how to adapt operations to achieve desired outcomes. They should also empower and incentivize the workforce to strive for a common set of goals.

Appendix. Supporting Resources

Key personnel interviewed for this report include the following:

- Mr Phillip Cherbaka; Principal Deputy, Corporate Information
- Mr Karl Kappra; Principal Deputy, Strategic Partnerships
- Ms Jennifer Mullins; Deputy Director, Research Business Directorate
- Dr Stephanie Piraino; Principal Deputy, Plans, Programs, and Budget Synchronization
- Ms Kimberly Ploskonka; Director (Acting), Research Business Directorate
- Ms Sheilah Simberg; Principal Deputy, Business Analytics
- Mr Fred Thompson; Principal Deputy, Laboratory Operations

Notable publications and other materials used in the development of report include the following:

1) Barker K. At the helm: leading your laboratory. 2nd ed. Cold Springs Laboratory Press; 2010.
2) Brabham DC. Crowdsourcing in the public sector. Georgetown University Press; 2015.
3) Chesbrough HW. Open innovation: the new imperative for creating and profiting from technology. Harvard Business Press; 2003.
4) Christensen CM. The innovator's dilemma: when new technologies cause great firms to fail. Harvard Business School Press; 2002.
5) DEVCOM ARL Research Business Directorate strategy. DEVCOM Army Research Laboratory (US); 2023.
6) Jain R, Triandis HC, Weick CW. Managing research, development and innovation: managing the unmanageable. 3rd ed. John Wiley & Sons, Inc; 2010.
7) Office of Science and Technology policy review on emerging technology. Report of the 60-day National Security Council. The White House; 2016.
8) Rogers EM. Diffusion of innovations. Free Press of Glencoe; 1962.
9) Sapienza AM. Managing scientists: leadership strategies in scientific research. 2nd ed. Wiley-Liss, Inc; 2004.
10) Schein EH. Organizational culture and leadership. 4th ed. John Wiley & Sons, Inc; 2010.

List of Symbols, Abbreviations, and Acronyms

ARD	Army Research Directorate
ARL	Army Research Laboratory
ARO	Army Research Office
DEVCOM	US Army Combat Capabilities Development Command
DOD	Department of Defense
KPI	Key Performance Indicator
RBD	Research Business Directorate

1 (PDF)	DEFENSE TECHNICAL INFORMATION CTR DTIC OCA
1 (PDF)	DEVCOM ARL FCDD RLB CI TECH LIB