Enabling Precision Sustainment Through Data

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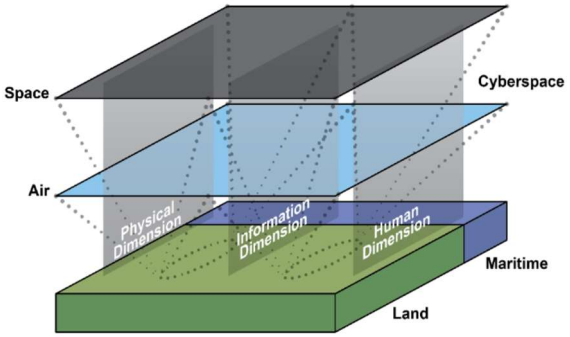
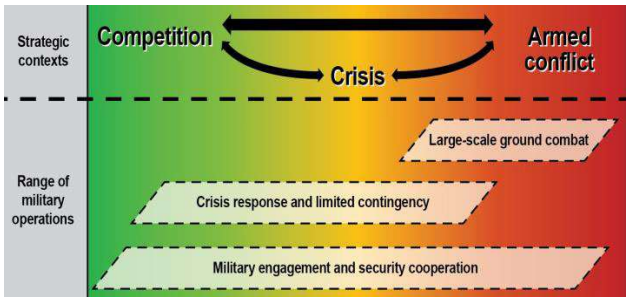
The emerging and future Multidomain environment demands and requires Sustainers to quickly organize and present data from multiple sources to describe the current sustainment situation and make data-informed decisions. Predictive logistics will provide transformative sustainment command and control solutions to include sensors and decision support tools while leveraging both Sustainment and tactical networking computing environments. While these tools will enable decision-making, Sustainers must be able to apply the ***analytical competencies*** and skills that account for ***interrelated effects*** across the industrial base, the global distribution system, and the complex, multidomain battlefield. ***Army Sustainment must adopt a culture of rigorous data-driven decision-making,*** and it starts by providing our workforce the analytic competencies required to optimize increasingly available data.

The Future Environment

As the world evolves to expand understanding and capabilities beyond the air, land, and sea, the Army's warfighting concept has also changed to reflect the need to integrate not just across the traditional domains, but also across space and cyberspace through human, physical, and information dimensions. The Army's Operations doctrine, FM 3-0, describes the principles of speed, range, and convergence of the cutting-edge technologies needed to achieve future decision dominance and overmatch against our adversaries. In this complex environment, the imperative to ***see ourselves, the enemy and understand the operational environment*** will require warfighters to rapidly collect, organize, analyze, and present decisions using data that cuts across domains and dimensions.





Multidomain operations (MDO) are the combined arms employment of all joint and Army capabilities to defeat enemy forces, and consolidate gains on behalf of joint force commanders.

Contested Logistics (CL). While our Army is transforming to harness new technologies and integrate across expanded domains, our adversaries are also leveraging cyber and space to contest our formerly unchallenged logistics superiority, seeking to deny operational reach, freedom of action, and endurance. In the contested logistics environment, we will be presented with challenges in all domains. Our logistics operations, facilities, and activities will be targeted, whether in the United States, abroad, or in transit.

In this contested logistics environment, Sustainers will need to posture themselves against their adversaries, from the Joint Strategic Support Area to the tactical area. Sustainment decision-makers must consider how to protect supply and distribution strategic capabilities in the United States, how to continuously set and reset the theater, how to get forces and equipment to the fight (power projection), and how to support them once there (sustaining distributed operations) - ***in an ever-changing environment where both information and presence is challenged***. The static "iron mountains" that were key to success in previous campaigns will simply become an easy target in the contested logistics environment. Across all echelons and domains – the Army must approach Sustainment operations very differently, build resiliency, and create multiple dilemmas to counter adversary actions against logistics.

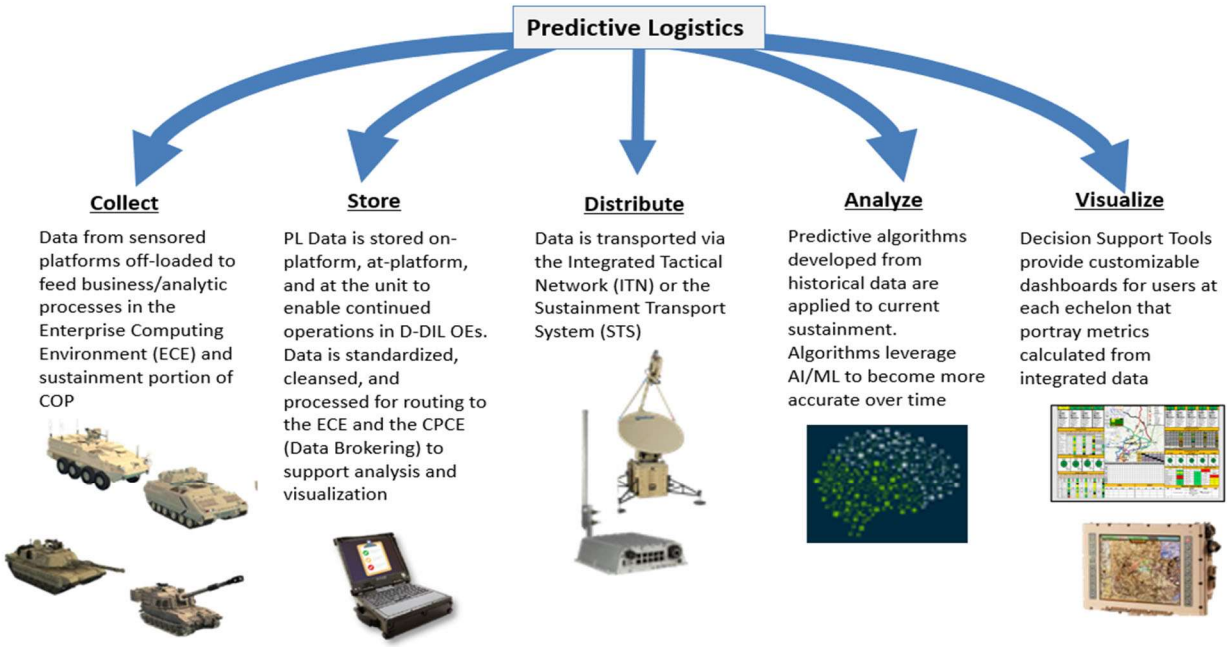
You will not find it difficult to prove that battles, campaigns, and even wars have been won or lost primarily because of logistics. ~ General Dwight D. Eisenhower

For Sustainment, achieving decision-advantage over the adversary requires the ability to collect and process vast volumes of data quickly and a means to provide relevant, reliable information to decision-makers faster than the adversary. **As decentralized operations become the norm, leaders at all levels must be comfortable using data for intentional decision-making:** The Sustainment Enterprise relies on data for tactical through strategic decisions. Sustainers must be able to use this data to rapidly gain understanding in a highly dynamic environment. Data is a powerful commodity that demands critical analysis and timely application to be used accordingly. As one of our Army's greatest producers and consumers of data – Sustainers must harness the power to collect, distribute, store, analyze, and visualize data. This links sensors to shooters to sustainers across the battlefield, and enables us to react faster and increase our ability to be proactive and predictive in an ever-changing environment.

Collecting and Distributing the Data

Sustainment must operate and integrate across strategic (Business) and tactical (Warfighter) Mission Areas. Sustainment data resides in both those areas, but the two computing environments are not well integrated. Additionally, tactical consumption and maintenance data has traditionally been collected manually—a cumbersome, inaccurate, and slow process that does not provide the precision and responsiveness required for decision dominance in multidomain operations.

Predictive Logistics (PL) will provide a transformative solution for the Sustainment and Command and Control (C2) warfighting functions (WfF), enabling precision sustainment and informing commanders' decisions in generating and sustaining combat power in Multidomain Operations (MDO) during Large Scale Combat Operations (LSCO) by 2030. Predictive Logistics seeks to use sensors, a blended computing environment, artificial intelligence/machine learning algorithms, and decision support tools to provide timely and accurate visibility of tactical support requirements while enabling strategic logistics organizations to predict outcomes and direct logistics capabilities at pace with the dynamic LSCO environment.

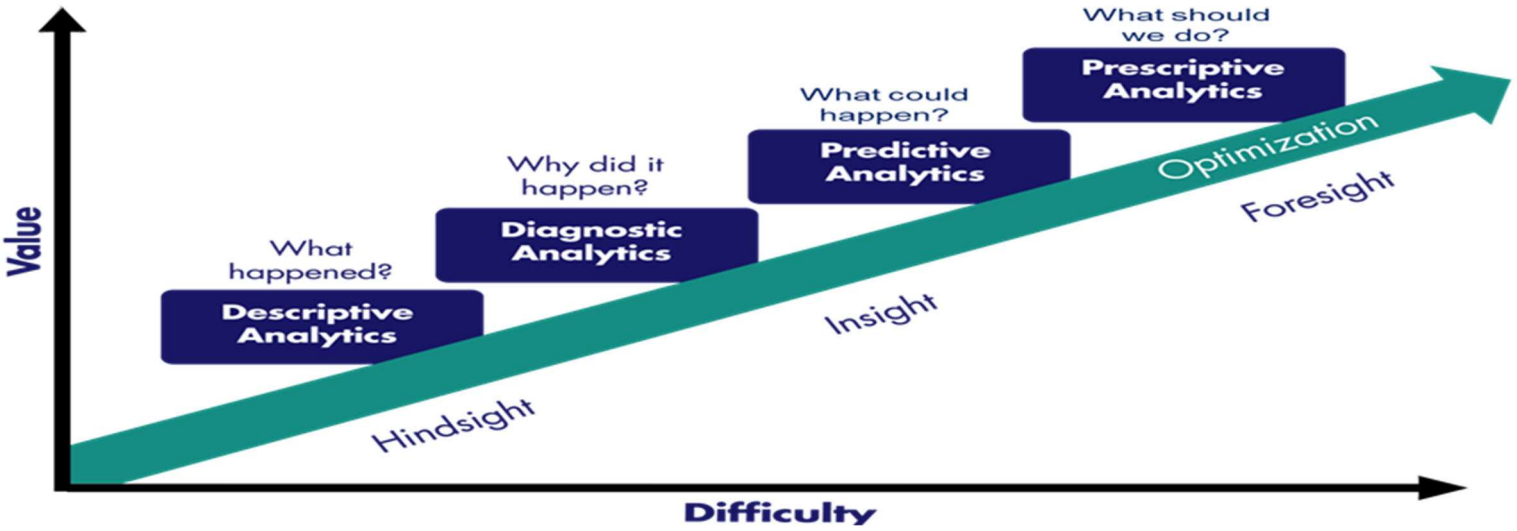


Predictive Logistics provides sustainment support and services ahead of need before the Warfighter registers a requirement, enabling faster and improved decision-making.

Data Analytics – integrating the human and information domains

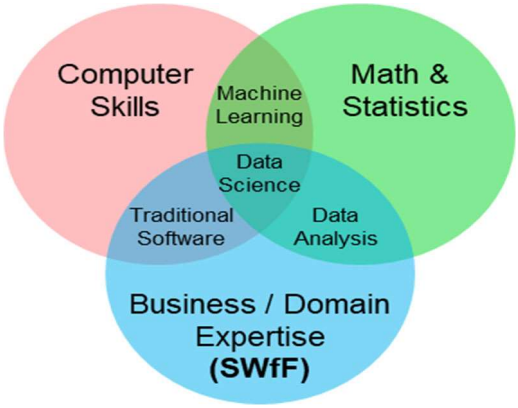
While predictive logistics solutions will harness and simplify data analytics, they will not replace the need for humans in the loop to apply warfighter expertise, think critically, or conduct planning. Sustainment leaders must become competent data citizens, able to integrate sustainment and data expertise to achieve decision dominance against our adversaries.

The Sustainment Enterprise relies on data for both tactical and strategic decisions. Sustainers must be able to use this data to rapidly gain understanding in a highly dynamic and connected environment. They must quickly organize and present data from multiple sources to describe the current sustainment situation to make data-informed decisions (Descriptive). Furthermore, they must be able to diagnose what has happened and why it happened (Diagnostic) (i.e., readiness trends, causal and correlational analysis), drawing on common data sets and organizing information for different purposes depending on their role in the supply chain. Additionally, they must have the ability to model data to predict and forecast future requirements, enabling an agile supply chain responsive to rapidly shifting environments (Predictive). Finally, sustainment leaders must possess analytical competencies and skills that enable them to prescribe optimal actions that account for interrelated effects across the industrial base, the global distribution system, and the complex, multidomain battlefield (Prescriptive).



Required Data Competencies

Data competencies include a blend of domain experience, computer skills, and mathematics/statistics. Fundamentally, all Sustainers require technical skills and knowledge of how to access, manage, visualize, and analyze data from various domain specific systems and expertise in both tactical and strategic supply chains, making up the domain experience. The intent is not to make every Soldier a data scientist with a skill set that includes a terminal degree. However, the Army must develop Soldiers and civilians who understand what they can accomplish by exploiting readily available data.



Data Analysis is a combination of Domain Expertise and Math/Statistics

Data Driven Decisions

At each level (strategic, operational, and tactical), decision-making is a human endeavor. Data-proficient Sustainers will have the tools to shape the analysis, communicate clearly, and inform decision-making.

<table>
<tr><td rowspan="6">Data Skill Sets:
• Read
• Work with
• Analyze
• Communicate

Data Analytic Fundamentals:
• Descriptive
• Diagnostic
• Predictive
• Prescriptive</td><td rowspan="6">Data is applied at all levels of echelon</td><td></td><td>Strategic Level</td><td>Operational Level</td><td>Tactical Level</td></tr>
<tr><td colspan="3">At each level the following questions are considered:
• What happened in the past?
• Why did this occur?
• What will occur in the future?
• What should we do about it?</td></tr>
<tr><td colspan="3">Although at each level of echelon the same questions are utilized, and data skill sets and fundamentals are applied – they are applied under different contexts.</td></tr>
<tr><td>Context of strategic level
• National Policy
• Theater Strategy
• Global Impacts</td><td>Context of operational level
• Campaigns
• Major operations</td><td>Context of tactical level
• Battles
• Engagements
• Small-unit and crew actions</td></tr>
<tr><td>Questions data helps answer:
• How quickly can we adjust for contingencies?
• What are the external factors affecting?
• Are the organic industrial base/ defense industrial base meeting battlefield requirements?</td><td>Questions data helps answer:
• How ready are we to meet known demand of today and tomorrow?
• How will resource constraints impact operations?</td><td>Questions data helps answer:
• How resourced and ready are the forces we have today?
• Are units postured with the right materiel, supplies, and people to execute the mission.</td></tr>
<tr><td colspan="4">Data is linked throughout all levels of echelon but the way it is applied vastly differs. When applying data to decision making capabilities there can be interlinked and connected issues that require understanding of the second and third order consequences of related decisions.</td></tr>
</table>

Data Increases the Odds

The conflict of tomorrow must be prepared for today—data as a strategic asset will assist our Soldiers and Civilians in making informed decisions in an environment that is highly complex, lethal, mobile, and rapidly evolving. To be one step ahead and meet the current conditions of the battlefield, professional military and civilian education and training must adopt the concept of data-centricity to ensure our leaders are prepared to thrive in multidomain conditions. Sustainment data must be standardized, integrated, and interoperable to enable information advantage over our adversaries, achieve demand reduction, increase agility within the warfighting function, and reduce risk to our Soldiers.

Through an understanding of the current and future battlefield, integration of predictive logistics, and the development of critical analytical competencies and skills, Sustainers across the Army will understand how to posture themselves against any adversary and will have the means to provide relevant, reliable analysis to decision-makers at the speed of conflict.

My second objective is to ensure the Army becomes more data-centric and can conduct operations in contested environments, which will enable our ability to prevail on the future battlefield.

~ Honorable Christine Wormuth, Secretary of the Army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