Editorial: welcome to the *Journal of Defense Analytics and Logistics*

We are pleased to present this inaugural issue of the *Journal of Defense Analytics and Logistics* (*JDAL*). The *JDAL* will promote and foster discussion and proliferation of new theory and applications across the logistics, operations research, data analytics and supply chain management space, particularly as that space intersects with the defense community. One might ask why introduce this journal now with the plethora of publishing outlets that are already available. The answer is that the community still lacks an outlet for rigorously reviewed, high quality work focused on the unique analytical and logistical challenges faced by the defense community. To this end, we will bring together key research and practical applications, making the work available not only to the academic community but also to the defense community that this research supports.

Defense analytics supports a wide range of theory and applications. The growth of operations research since the Second World War has been quite dramatic. Early works firmly established quantitative approaches based on mathematical programming and probabilistic modeling, as well as modeling and simulation and statistical modeling. Current "buzz words" (such as big data and machine learning) represent the new "toolisms" that will dominate defense analysis and discussion for some time. The *JDAL* welcomes work in both the old and the new techniques, particularly as those works help evolve the defense establishment toward the beneficial employment of these analytical techniques.

Governments across the globe spend a combined US$1.76tn on defense. For instance, with an annual budget of nearly US$600bn, the US Department of Defense (DoD) represents the largest government expenditure in the world, representing 54 per cent of discretionary US spending in 2015. Indeed, the US DoD alone manages a US$309bn supply chain, and several of the largest public companies in the world support the global defense industry. Since the dawn of human conflict, logistics capabilities and supply chain management have been used to enable defense power projection. Modern supply chains incorporate information technology, resiliency and other technological and administrative innovations to meet the challenges of an ever-changing military-industrial complex. As the digitization of the supply chain becomes a reality, there is also a need to incorporate data science and analytical breakthroughs to provide greater supply chain insights and enhanced decision-making abilities. A focus on these latest technologies is encouraged. That said, the *JDAL* will be looking for cutting-edge theories and implementations in any area impacting the defense-industrial logistics complex.

We developed the *JDAL* review process for regular research papers around a double-blind review process; neither the authors nor the reviewers are made aware of the other's identity during the review process. This approach removes potential biases in the review process, thereby retaining quality and objectivity. At *JDAL*, we believe in a traditional peer-review process versus the convoluted and inefficient "peer-writing" process that seems to be used by many top journals today. We wish to report research findings based on the

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researcher's perspective and ask that our reviewers focus less on providing opinion-based or "how I would have done it" feedback and more on providing comments related to the quality, impact and technical accuracy of the work as reported. The result of this approach is a fair review process that limits the need for several rounds of review, increases the quality of articles submitted and ultimately reduces the time between first submission and publication. Finally, we have also developed the *JDAL* as an open-access, non-publication-fee journal format. Using external funding to cover publication costs, the *JDAL* format provides an ideal mechanism to get new theory and application out to the academic and defense community in a timely fashion.

In short, the *JDAL* will act as a vehicle to bring the defense analytics and logistics community closer together while simultaneously infusing that community with new theory and application. The journal will publish leadership editorial pieces, original research papers in defense analytics and in logistics and supply chains, as well as summaries of interesting ongoing and past studies.

This inaugural issue contains five peer-reviewed articles covering a range of issues. This issue commences with leadership insights from the Air Force's top analytics leader and member of the senior executive service, Mr Kevin Williams. His words outline both recent successes and current challenges to advancing military analytics capabilities and outcomes.

The first article, "Identifying students at risk in academia: analysis of Korean language academic attrition at the Defense Language Institute Foreign Language Center", by authors Adam Haupt, Jonathan Alt and Samuel Buttrey examines eight years of retention data pertaining to over 2,000 students with nearly 40 useful independent variables. The data are then used to build a suite of models, based on logistic regression, identifying key indicators of students at risk of failing their Korean language studies. Students thus identified can be provided remedial training, ultimately leading to successful completion of the program.

The second article is entitled, "Modeling median will-cost estimates for defense acquisition programs", by authors Ryan Trudelle, Edward White, Dan Ritschel, Clay Koschnick and Brandon Lucas. The authors address the change in acquisition program cost estimation philosophy from an aggressive "should cost" philosophy to a more practical "will cost" philosophy. Using historical data from 58 programs, they develop a statistical model (based on median data) with which to calculate an estimate of what the program is expected to cost; this is referred to as the program's "will cost". Such a model provides value, as programs can start with improved estimates of the cost, thereby positively influencing program schedule and management actions.

The third article, authored by Cardy Moten III, Meghan Kennedy, Jonathan Alt and Peter Nesbitt, is entitled "Analysis of performance on a modified Wisconsin card sorting test for the military". The DoD requires leaders with agile and adaptive decision-making capabilities; there is currently a lack of tools with which to screen for this capability. The authors modify an existing psychological test to involve a military-focused task and then assess this modified test. The subsequent study involved 34 participants and showed promising results associated with future use of the modified test. This work has positive implications for all DoD personnel selection processes.

In the fourth article, "Examining the effects of source selection method on procurement outcomes", authors Timothy Hawkins, Karen Landale and Rene Rendon compare the low-price, technically-acceptable (LPTA) method against the full trade-off (TO) method. Using data derived from 124 procurement contracts executed by the US DoD, the authors describe how and why one method yields better outcomes over the other in terms of several important performance goals, to include procurement lead-time and supplier performance.

In the final article, "Forecasting US Army enlistment contract production in complex geographical marketing areas", Joshua McDonald, Edward White, Raymond R. Hill and Christian Pardo focus on the projections made within the Army recruitment process. The US Army needs realist recruitment goals. The authors present their approach to map existing geographic statistics into the requisite recruiting markets. The authors then present an improved method by which the data are processed to reduce the problem dimensionality; at which point, a parsimonious model is presented and used to develop improved predictions of market contract levels. Comparative and data validation results are presented.

Finally, the journal will include vignettes of studies, completed or ongoing, that are of interest to the defense analytical and logistics community. These pieces will be short and concise, but will provide a mechanism to link the communities along lines of mutual interest, and ideally mutual benefit. The vignette for this inaugural issue summarizes a study on automated software testing in the DoD, something of interest to all DoD programs. Moving into the future, we solicit the community to not only consider the refereed entries to *JDAL*, but also consider the vignette opportunity to highlight what you and your organization are doing for our defense establishment.

In closing, we want to invite those working in the defense analytics and logistics community to consider contributing to and reading the *JDAL*. We look forward to serving the community and hope that you enjoy this new journal!

Ben Hazen and Raymond R. Hill
Co-Editors-in-Chief
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