

An Introduction to Uniformed Operations Research

Operations research/systems analysts bring mathematics and computer modeling to decision-making in order to provide commanders with the best available information and improve the success rate of implemented decisions.

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In his article, “Leveraging Information for a Competitive Advantage,” in the May–June 2014 issue of *Army Sustainment*, Col. Jeffery C. Powell argued that “the Army must hire, train, and organize a professional cadre of analysts who will be charged with providing decision-makers with timely and relevant information.”

According to Department of the Army Pamphlet 600–3, Commissioned Officer Professional Development and Career Management, the Army’s operations research/systems analysis (ORSA) functional area (FA) 49 “provides uniquely skilled officers that assist decision makers in solving complex problems by producing the analysis and logical reasoning necessary to inform and underpin those critical decisions.”

The pamphlet goes on to say that, much like analysts in the private sector, “ORSAs introduce quantitative and qualitative analysis to the military decisionmaking process by developing and applying probability models, statistical inference, simulations, optimization and economic models” from the division through Department of Defense levels. This article will discuss the initial transition, education, and operational use of uniformed ORSAs within the Army.

Becoming an ORSA

ORSAs are former maneuver, combat support, and sustainment officers who have transitioned into FA 49 after completing sufficient time in key

development positions at the rank of captain. In the absence of a functional designation board, captains and majors interested in entering FA 49 need to look for open Voluntary Transfer Incentive Program windows and apply.

Officers who apply should be high performers, have a solid mathematics background, and be comfortable working at higher levels within the Army. With fewer than 450 authorized slots within the force, ORSAs comprise a small population, making the application process competitive.

ORSA Education

After being designated FA 49, officers are provided with a fundamental education in the methodologies associated with operations research. Some officers attend graduate school and obtain master’s degrees in approved disciplines, such as operations research, systems engineering, or applied mathematics. Many FA 49 positions are coded for either a master’s degree or a doctorate degree; approximately 80 percent of FA 49 majors hold a degree higher than a bachelor’s.

Operations research and systems engineering are complex skills; therefore, all new ORSAs will receive initial training either through the Advanced Civil Schooling program or the Army Logistics University (ALU) at Fort Lee, Virginia. If officers are not initially selected to attend Advanced Civil Schooling, they

have the opportunity to attend after subsequent assignments.

Many ORSAs receive their initial education at ALU through the ORSA Military Applications Course (ORSA–MAC). ORSA–MAC is a 14-week course designed to provide military and civilian students with the basic skills required of an ORSA. The first four weeks of ORSA–MAC ensure each student has a strong understanding of calculus, data analysis, statistics, and probability. With that mathematical foundation in place, students move on to more advanced subjects.

The second phase of ORSA–MAC exposes students to cost analysis, mathematical modeling, linear statistical modeling, simulation, and decision analysis. Students are also required to demonstrate competency in communicating analytics to decision-makers.

Cost analysis techniques include cost benefit analysis, inflation adjustments, and net present values. Mathematical modeling allows the analyst to explore optimization or utilization of resources, such as maximizing productivity while minimizing cost.

Linear statistical modeling examines variability in data through regression and analysis of variance. An example would be to determine if one vehicle gets significantly more miles per gallon and, if so, ascertain what contributes to the difference. Simulation allows analysts to build models conforming to observed be-

havior and gain insights from changes in the model.

Decision analysis methodologies allow analysts to address risk and competing priorities when leaders are faced with alternative courses of action. Practical application is gained during combat modeling lessons, ORSA studies, and a final capstone exercise that exposes students to the studies process.

Upon graduation from ORSA-MAC, students are generally assigned to organizations with many FA 49 positions, where they can learn from more seasoned officers and civilians. They are expected to continue their education in the specific tools used to perform their duties.

Army officers return to ALU several years later to receive additional education through the FA 49 Qualification Course. They enroll in that course after completing the Command and General Staff Officer Course (formerly known as Intermediate Level Education) and at least one FA 49 assignment.

During the six-week FA 49 Qualification Course, ORSAs learn more about how the Army runs and how FA 49 officers aid the process. They explore the roles of FA 49s in the operating and generating forces, in the Department of the Army, in joint environments, and on the Office of the Secretary of Defense (OSD) staff. Students learn about strategic thinking and the various problem solving methods that their future bosses learn at the Army War College.

FA 49 officers come together from across the Army and learn from one another during class interaction, practical exercises, and a real-world capstone project. Recent projects came from the Army G-3/5/7, the Army G-8, the Army Marketing and Research Group, and the Combined Arms Support Command.

What ORSAs Do

ORSAs can be found throughout the Army, from division headquarters to the OSD staff and commander's initiative groups. ORSAs often pro-

vide insight into problems that are found at the highest levels within the Army. Those problems currently include the following topics:

- Identifying trends in enemy data for theater commanders.
- Predicting the next large-scale cyber attack.
- Recommending the best affordable mix of unmanned aerial vehicles through 2030.
- Examining options to integrate women into combat arms.
- Recommending the best alternative for the joint light tactical vehicle.

Although other branches or functional areas can accomplish some of these tasks, ORSAs bring mathematics and computer modeling to the decision-making process. Col. Powell wrote in his article that the private sector uses "data analytics to shorten decision cycles, make decisions with the best available information, and improve the success rate of implemented decisions," and the Army does that, too.

Operating force. In the operating force, an FA 49 officer serves on a division, corps, Army service component command, or geographic and functional combatant command staff as a commander's lead data analyst and mathematician. ORSAs often help develop a unit's assessment plan and track its progress toward success.

Generating force. In the generating force, ORSAs help shape the Army of tomorrow by providing information for decisions on acquisition, accession, and force design. ORSAs support the efforts of organizations such as the Army Capabilities Integration Center and the Training and Doctrine Command Analysis Centers. The Army Human Resources Command uses ORSAs to forecast requirements for accessions, promotions, and retention. Generating force assignments for ORSAs also include the United States Military Academy, the centers of excellence, ALU, and the Training and Doctrine Command.

Army, joint, and OSD staffs. Because FA 49 officers support senior leaders, it follows that they fill critical billets within Army, joint, and OSD staffs. Serving within the G-1, G-3/5/7, and G-8, ORSAs support program objective memorandum, force design, and planning, programming, budgeting, and execution processes. ORSAs also fill joint billets within the Joint Chiefs of Staff, various OSD organizations, and select NATO assignments.

Few can argue the need for analysts within the Army. In fact, as Col. Powell's article emphasized, the Army's need for ORSAs has increased. FA 49 officers serve across the force, but more organizations could benefit from the mathematical and data analyses that these professionals provide to senior decision-makers. Search out the ORSAs within your organization and leverage their quantitative and qualitative analysis skills to strengthen decisions with mathematical rigor.

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