



Slaying the Software Dragon

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It continues to be a daunting task to educate members of the Department of Defense acquisition work force who acquire, develop, engineer, test and evaluate, conduct research on, or procure software-intensive systems. The Information Resources Management College and the Defense Systems Management College have developed a software acquisition management curriculum that meets the certification requirements and educational needs of the community. It takes "dragon slayers" armed with the knowledge of software acquisition management to slay the "beast."

"640K ought to be enough for anybody." – Bill Gates, circa 1981

The beast continues to grow. Our systems are becoming more software intensive because software is replacing the functionality formerly performed by people and hardware. Rear Adm. Robert M. Moore, former commander of the Naval Information Systems Management Center, identified this transition in March 1993, when he stated,

"At one time, it was the hardware that supported the mission. Today, the hardware is rather generic, capable of supporting any mission. It is the software that provides the real functionality."

In a 1992 report to the House Armed Services Committee, the General Accounting Office (GAO) estimated that total annual software cost would account for 20 percent of the Department of Defense's (DoD) budget by 2008 [1]. Last October, Federal Sources, Inc. completed a survey of defense spending on software used for weapons systems, information systems, and command, control, communications, computers, and intelligence systems [2], excluding software for nontactical systems. The report projected that by 2002, DoD will spend over \$20 billion annually on software.

Software acquisition and development within DoD continues to be a significant management problem. Software is the critical component of today's defense systems. A variety of studies and analyses over the past 13 years have continued to identify significant sys-

temic software acquisition problems. The beast is fed by a dearth of software acquisition management education.

The Dragon's Lair

People who are not masters of software technology and acquisition management build the dragon's lair. Many studies relate DoD's "software crisis" to a need for software acquisition management education. In September 1987, the Defense Science Board Report on Military Software, office of the under secretary of defense for acquisition, stated,

"Application-knowledgeable, technically skilled leaders are the military's *limiting resource* in acquiring today's computer technology. ... Few program offices are staffed [properly] due to a shortage of qualified people. ... [T]he DoD should implement the education and training necessary for its *software acquisition management personnel* to master both software technology and *acquisition management*."

The DoD Software Master Plan, Vol. I (draft), February 1990, developed by the Defense Acquisition Board Science and Technology Committee, reported,

"Improving software education and training is critical. ... [T]here is a need to coordinate efforts of the National Defense University, Defense Systems Management College, and Industrial College of the Armed Forces to integrate software *acquisition* and development programs into existing courses and to establish mandatory software engineering education for all DoD technical and contractual

personnel involved in the *acquisition* process."

The DoD Information Systems (IS) Work Force Education, Training and Career Development, Executive Resources Task Force Report (October 1992) asserted,

"Technical vitality of the IS work force is critical to effectively deploy information systems in support of the DoD war-fighting mission. The need to provide recurring technical training to individuals, *especially at midcareer and executive levels*, was communicated throughout our meeting with services, agencies, and private industry. This training is essential to ... keep pace with the acquisition of more advanced computer and telecommunications systems."

The Crusade

"The educated differ from the uneducated as much as the living from the dead." – Aristotle

The "crusade" is not a "death march." There is a critical need for a work force highly trained in the complex programmatic discipline of software acquisition management. The need for a review of the DoD's software acquisition management education and training curricula and career programs was identified in May 1993 by the Acquisition Management Functional Board, an organization that advises DoD component executives in the management of accession training and career development of acquisition work force personnel. On Oct. 19,

Course	Level	Target Audience	Format	Prerequisite
SAM 101	I	GS-9 and below and military ranks 01-03	Distance education, 18 lesson modules.	ACQ 101
SAM 201	II	GS-9 and above and military ranks 03-04	10-day classroom-based curricula.	ACQ 201, SAM 101
SAM 301	III	GS-12 and military ranks 04 and above	10-day classroom-based curricula.	SAM 201
NDU Elective 5546		GS-13 and military ranks 05 and above	Fall and spring semester, two hours weekly for 12 weeks. Seminar format.	

Table 1. Course offerings. SAM 101 is expected to be available in October 1998.

1993, the Terms of Reference for the review of software acquisition management education was approved by Colleen A. Preston, then deputy under secretary of defense for acquisition reform.

Approved in March 1994, the team's report established a set of nine critical competencies and 24 key competency areas. In addition, the report contained the recommendation for the development of assignment-specific mandatory courses for software acquisition personnel for Level I, Level II, and Level III training career levels.

Arming the Dragon Slayers

"Technology is dominated by two types of people: those who understand what they do not manage, and those who manage what they do not understand."

– Anonymous

The dragon slayers must be armed with the education to manage the acquisition and development of the growing number of software-intensive systems—to annihilate the dragon. Under the auspices of the Defense Acquisition University (DAU), the Information Resources Management College (IRMC) at the National Defense University (NDU), and the Defense Systems Management College (DSMC) began joint development of an evolutionary course curriculum. IRMC was tasked to lead the design of the capstone course, Software Acquisition Management (SAM) 301, and DSMC led the design of the basic

and intermediate courses, SAM 101 and SAM 201.

The software acquisition management courses are assignment-specific. These courses have been identified by the under secretary of defense for acquisition and technology as integral to the education of acquisition work force personnel. They are a means to provide unique acquisition knowledge required for a specific assignment, job, or position. They maintain proficiency while remaining current with legislation, regulation, and policy. The SAM courses are for people who acquire, develop, engineer, test, evaluate, conduct research on, and procure software-intensive systems.

For students attending the colleges of the NDU, the National War College, the Industrial College of the Armed Forces, and the IRMC's Advanced Management Program, software acquisition management education is available through the NDU electives program. Future Directions in Software Management (Elective 5546) investigates cutting-edge practices for developing high-quality software-intensive systems. This course focuses on challenges that face program management personnel, managers of software development organizations, information management officers, and corporate information officers involved in the acquisition of software-intensive systems. The course shows how to manage software acquisitions using state-of-the-practice methods and techniques and lets the operator and acquirer gain a mutual perspective on the issues

involved in acquiring systems that sustain the war fighter.

The Challenge

"Sometime they'll give a war and nobody will come."
– Carl Sandburg

Few dragon slayers have taken up their swords and joined the crusade to slaughter the dragon. During the 1997 academic year, the two colleges were prepared to educate 325 students in 13 SAM 301 offerings. Reality was 66 DoD students in eight offerings, and the colleges had to combine courses to have class sizes that facilitated the seminar format. For SAM 201, the numbers have been equally dismal.

Why the low response? Maybe it is because software acquisition is not perceived to be a career field. Maybe it is because the realization has not sunk in that all systems are information systems and the ubiquitous thing that moves, manages, manipulates, and presents that information is software. Maybe it is the drawdown of the acquisition work force. Maybe it is because SAM courses are another set of education requirements that takes the person out of the workplace. For whatever reason, the "software education crisis" is not being rectified, and the dragon still roams the land, largely unchallenged by properly equipped dragon slayers.

The students' evaluations of the courses indicate that the colleges have developed quality programs that meet the needs of the software acquisition professional. This shortfall means that seats are readily available. Join the crusade to slay the software dragon.

Join the Crusade

Join the small legion of dragon slayers—make the choice and grow. The SAM 301 and SAM 201 schedule for the remainder of 1998 is as follows:

SAM 301

April 27-May 8, DSMC, Fort Belvoir, Va.
June 15-26, IRMC, Fort McNair,
Washington, D.C.

Aug. 17-28, DSMC, Fort Belvoir

SAM 201

June 15-25 IRMC, Fort McNair

Learn About the Crusade

“Education’s purpose is to replace an empty mind with an open one.”
– Malcolm Forbes

For more information on these courses, visit the following Web sites or contact the faculty.

<http://www.ndu.edu>
<http://www.dsmc.dsm.mil>
<http://www.acq.osd.mil/dau>

SAM 301

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Voice: 202-685-2062 DSN 325-2062
E-mail: Michell@ndu.edu;
Larry Baker
Voice: 703-805-3636 DSN 655-3636
E-mail: bakerl@dsmc.dsm.mil

SAM 201

Lt. Col. Rob Simmons
Voice: 703-805-5419 DSN 655-5419
E-mail: simmons_rob@dsmc.dsm.mil
Dr. Michael Martin
Voice: 202-685-4880 DSN 325-4880
E-mail: martinm@ndu.edu

SAM 101

George Prosnik
Voice: 703-805-3578 DSN 655-3578
E-mail: prosnikg@dsmc.dsm.mil ♦

References

1. General Accounting Office Report, IMTEC-92-62BR.
2. Seffers, George I., “Survey: Software Cost to Exceed Hardware,” *Defense News*, Nov. 10-16, 1997, p. 6.

About the Author

Lt. Col. L. John Michel, III is a professor of systems management at the IRMC at the NDU. He is course manager for SAM 301 and Future Directions in Software Management. His fields are software acquisition, interoperability, and architectures. He has over 16 years experience in the development of command and control, intelligence, and combat support systems.

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Software Capability Evaluation Reuse and Reform

Industry had complained for years that it was swamped by government demands for software capability evaluation-related paperwork and visits, and different agencies often wanted the same information. The situation became common enough to acquire a name: redundant reviews.

“Industry continues to assert that it seems as if the government is constantly looking at them, asking the same questions and getting the same answers,” said Lt. Col. Charles F. Vondra, U.S. Army acquisition reform staff officer, office of the deputy under secretary of defense. “This is a great example of what acquisition reform was meant to fix. A typical Software Capability Evaluation (SCE) costs the government an estimated \$50,000, and contractors say it costs them a similar amount. When an SCE repeats an earlier evaluation, it just wastes time and money. The overall goals of the entire process are to make consistent, reliable information widely available, to save money, and to ensure equitable treatment of contractors.”

Last July, R. Noel Longuemare, acting under secretary of defense for acquisition and technology, directed the Systems Engineering Steering Group to find ways to improve the system for performing SCEs.

The current policy is to reuse the results of earlier evaluations whenever possible by updating them so that they reflect an offeror’s current capability. A system being implemented to assist in executing this policy consists of

- The software center operated by the Defense Contract Management Command (DCMC) in Boston, Mass. will collect all information on source-selection SCEs conducted on Department of Defense (DoD) contractors.
- Completed SCEs will reside at the Air Force Electronic Systems Center, a DoD SCE repository established at Hanscom

Air Force Base, Mass. This repository draws on work by the Army’s Research and Development Engineering Center, Communications-Electronics Command and the Naval Command, Control, and Ocean Surveillance Center.

- All government-sponsored teams (not just DoD teams) will have access to the SCE results.
- Information will be safeguarded as source-selection sensitive.
- Results of SCEs will be shared with offerors, who may provide comments that will also be put into the repository at Hanscom.

As in so many other acquisition reform initiatives, a hero of the SCE story is an Integrated Product Team. After Longuemare’s directive, the “SCE Team” was established to find ways to use SCE information more systematically.

As it happened, the team was able to build on earlier work. A tri-service group was formed four years ago to promote the use of SCEs in evaluating development risk and to improve consistency in applying the SCE method.

Then, last year, a pilot program was launched at the Electronic Systems Center to reuse SCEs, which resulted in approximately \$1 million cost avoidance. This pilot led to the formation of the Government SCE Consortium last May, also led by the Air Force’s Electronic System Center. The consortium’s future role will be to provide a forum for sharing experiences and to gather new ideas to improve the application of SCEs and reusing them.

“The Acquisition Reform office is also looking at government-performed SCEs as temporary,” Vondra said. “We would eventually like to see a commonly accepted evaluation by an independent third party, similar to ISO 9000 quality certification in manufacturing.”

“We want a professional, consistent system with reliable information that is less intrusive to industry and uses information smarter and faster.” ♦

This announcement is based on “SCE Reuse: Ending Redundant Reviews,” AR Today, January/February 1998, Vol. 3, No. 1.