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# INTRODUCTION

## Purpose

This report provides a comprehensive examination of efforts to exploit the digital information environment, and their application within Defense acquisition programs. While relevant to the entire Acquisition Community and their industry counterparts, the target audience is the Department of Defense (DoD) Program Manager (PM) and Program Management Office (PMO). They have the ultimate responsibility of meeting the needs and achieving the goals of an acquisition program, but have not been well prepared to capitalize on the emerging information age. In this research, we develop the concept of an Acquisition Program's Digital Environment (APDE)[1] to describe a cross functional integrated digital information infrastructure that supports a DoD acquisition program. The APDE links the entire acquisition program team, to include not only the PMO and prime contractor personnel, but also subcontractors, vendors, suppliers, support agencies, and end users. An APDE can take many forms, depending largely upon the extent to which an acquisition program is able to exploit digital information technology and integrate processes efficiently and effectively. If increased productivity and substantive cost savings through process improvement and reengineering are program objectives, evidence shows that such a digital environment is a key enabler and a necessary precondition for success.

## Program Manager

In the DoD, PMs are selected for a new or legacy acquisition program[2] because they are professionally competitive and meet the requirements of the Defense Acquisition Workforce Improvement Act (DAWIA).[3] PMs generally arrive focused on a vision for their new domain. They understand the users' requirements and are prepared to implement those business processes they believe to be compliant, appropriate, and sometimes innovative. They may have helped build financial estimates and feel comfortable with the budget cycle, or even helped persuade a financial oversight committee to restore the funding of a program. In some cases, PMs may have been through a couple of difficult senior program reviews, and know how to effectively navigate to the next major milestone. Despite what PMs may or may not have experienced, the acquisition landscape is changing within the DoD. The recent introduction of the Federal Acquisition Streamlining Act (FASA), along with new implementation initiatives such as integrated product and pro-

cess teams, process reengineering, process improvement, and down-sizing are all testimony to the most recent visible changes. There is yet another significant change taking place that is even more dramatic yet somewhat obscure—the process of *integrating digital environments.* The following questions might be typical of a PM's response to such an initiative.

- Is it necessary?
- What does it really constitute?
- Who in my organization can help explain it to me?
- Where else do I go to learn about integrated digital environments?
- Is it or should it become one of my core competencies?
- What are the directives and/or mandates that govern its implementation?
- What is my motivation to implement integrated digital environments?
- Will it help me do my job faster, better, smarter, cheaper now?

Digital technology is not really new at all. However, the emerging technologies to employ it in an integrated fashion are evolving so fast that it is outpacing the time necessary to understand how we can make an integrated digital environment work and ultimately capitalize on its benefits.

Many compelling arguments can be made that easily justify the need for PMs to better understand and appreciate the benefits of integrated digital environments. For one, "going digital" is now guidance for those of us involved with DoD weapons system acquisition. One key element of the DoD Regulation 5000.2-R directs by fiscal year 1997 "all new contracts require on-line access to, delivery of, their programmatic and technical data in digital form, unless analysis shows that cycle time or life cycle costs would be increased by doing so."[4] However, recognizing that the development of an integrated digital environment can save a program time, money, and improve process efficiency provides greater significance.

**Digital Fog**

From the beginning of our research we detected a digital fog that can easily screen the PM's view of digital information environments. The DoD and industry have been incorporating many digital initiatives for streamlining, promoting greater competition, and improving business practices for the last decade with a confusing number of digital directives, digital standards, and digital strategies. Integrating digital information environments is relatively recent and revolutionary. Notwithstanding, there is no single organization in the acquisition community responsible for developing and maintaining a roadmap that would help PMs navigate their respective digital domains. According to one PM, "the lack of definitive guidance and a prescribed way to do it are the biggest blocks. We are having to feel our way through and we may be going down a dead end path."[5] Not surprisingly, the employment of integrated digital environments within PMOs has been disparate. The creation of one might be constrained both by the PMs' vision and their budget even though they may recognize "information technology must be viewed as an investment."[6]

Each PM is hired to produce a quality system that meets the user's needs within budget and

on time. Their plan of action is governed by Federal Acquisition Regulations (FARs) which require that PMs develop an *acquisition strategy* early that addresses the mission need in the most effective, economical, and timely manner.[7] Even though available guidance on how to best exploit the digital environment to support their strategy has not yet materialized, *a few* program offices have taken advantage of the enabling and evolving digital resources. On the other hand, increasingly more industry partners are designing, manufacturing, testing, and supporting defense systems within digital environments, developing new systems digitally, and creating dynamic digital enterprises. Since the PM is at the center of gravity and considered an integral member of their weapon system enterprise, it is vital that the PM embrace an integrated digital environment before they can ever hope to best exploit it.

Since 1988, the DoD has spent between 4 and 5 billion dollars fueling the many components of an Integrated Data Environment (IDE) in its attempt to accommodate the delivery of digital product data to the weapon system sustainment communities. Despite DoD's efforts, however, an IDE's benefits to the acquisition community are not always well known, well understood, or well communicated. In some cases, promises of significant overall cost reductions are not even believed. DoD training courses are targeted toward logisticians, contracting officers, engineers, and data managers. They do not focus on PMs or on integrating processes. Compounding the problem is the fact that the basic construction of a robust IDE may not come cheap. There is now an issue of who pays. In light of shrinking Defense budgets, PMs may be left with doing everything they can to simply sustain their program and still satisfy the user's needs. Since 1994, some major weapon programs have had to realign their program, annually, because of congressional directed funding reductions. It is easy to understand why resources necessary for a robust digital environment may be sacrificed; PMs may not easily envision a return on investment during their watch. Clearly, before committing any program dollars for an APDE, the PM needs to know what is important and what works today before the DoD can expect them to "buy-in" to the proposed merits of an APDE such as:

- Cost savings;
- Reduction in cycle time;
- Improved life cycle support;
- Increased process and product coordination;
- Suitability and quality of data;
- Greater access to data; and
- More timely decisions.

**Methodology**

We systematically approached the topic of digital environments and generated our hypothesis—that developing an APDE is important to PMs—well before we knew much about the subject matter. We conducted an initial literature review of Defense Acquisition University (DAU) web sites on the Internet. We concentrated on Electronic Commerce (EC), Electronic Data Interchange (EDI), Continuous Acquisition and Life-Cycle Support (CALS), and overall Digital Environment (DE) activities. We visited over 200 other related global Internet sites and discovered them to be wealthy sources of information. These virtual visits helped us qualify our research and establish key points of contact early. The Internet

alone helped streamline access to what information we really needed, expediting the first stage of our research efforts. Because of the magnitude of the research domain selected, the Internet served as an additional quick look assessment of pertinent literature. Embedded at each site were also connections or *hot links* to other sites that increased the sites' value and extended our reach to applicable organizations. In most cases, the Internet also provided details about the organizations we wanted to visit. As a result of this preview, we were better prepared for our site visits.

We conducted in excess of 100 interviews with over 40 separate DoD PMOs and defense contractors within the United States. These particular site visits were the most useful element of our data collection. They provided a realistic snapshot of how organizations viewed and employed variations of APDEs. In order to allow for open and honest discussions with PMOs and industry, we agreed to the accepted principle of non-attribution, whereby no individual or organization would be referenced directly without permission. Thus, in some cases, this book cites information derived from interviews not attributed to a specific source.

We developed a questionnaire that was sent to each site prior to our visit. This questionnaire served as a baseline for our discussions and helped each organization bring together their interview teams. We also derived additional question sets that were tailored to each individual site.

**Objectives**

We selected our research topic because of our own desire to understand integrated digital environments, identify how to best exploit them, and determine their application to the PM. We also wanted to apply what we learned from the first phase of our research fellowship, attendance at the Harvard University Graduate School of Business Administration. Our Harvard experience was extremely rewarding and provided unique business perspectives outside the DoD that could be applied to many DoD processes.

We quickly found that it was important to anchor our research because of the extensive scope of the overall digital environment. We therefore established the following framework for our report:

- Target audience is the Defense acquisition community;
- PMs need a working level understanding of the environment;
- PMs need to be aware of the benefits of an integrated digital environment;
- PMs need to understand the experiences of others in the field;
- PMs need a step-by-step approach how to exploit the digital environment today with current technology; and
- PMs need to appreciate the issues and know where to go for help.

1. APDE is an acronym used throughout this report to depict a proposed model for working within the digital environment. However, it is not an official DoD acronym.

2. A directed, funded effort that is designed to provide a new or improved materiel capability in response to a validated need. (See DoD Directive 5000.1, reference (g).) Acquisition programs are managed, in accordance with reference (g), DoD Regulation 5000.2-R, and related DoD issuances.

3. Public Law 101-510, Title XII (10 U.S.C. 1701-64 of Title 10, United States Code), Section 815, Defense acquisition workforce improvement act, adopted by Congress in 1990. [On-line]. Available Internet: http://www.dtic.dla.mil/acqed2/legislation/hlang93.html

4. Office of the Secretary of Defense. (March 15, 1996). Department of Defense Regulation 5000.2-R, mandatory procedures for major defense acquisition programs (MDAPs) and major automated information system (MAIS) acquisition programs, paragraph 3.3.4.5. Washington, D.C.: Author.

5. Personal interview with a DoD PM April 1996.

6. Gauthier, M. & Clavier, C. (26 Apr 96). LPD 17 designing for ownership. Presented at the Association of Science and Engineering 33rd Technical Symposium (Approved for public release, distribution unlimited, Amphibious Transport Dock Ship Program Office, Naval Sea Systems Command).

7. General Services Administration. (March 1996). Federal Acquisition Regulations (FARS) Part 34: major system acquisition subpart 34.0—general para 34.004. acquisition strategy. [On-line]. Available Internet: http://www.gsa.gov/far/90-37/html/34.html