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**AN ELEVEN YEAR RETROSPECTIVE OF
THE ACQUISITION REVIEW JOURNAL**

THESIS

Mitchell J. Elder, Captain, USAF

AFIT/GSP/ENV/05M-02

**DEPARTMENT OF THE AIR FORCE
AIR UNIVERSITY**

AIR FORCE INSTITUTE OF TECHNOLOGY

Wright-Patterson Air Force Base, Ohio

APPROVED FOR PUBLIC RELEASE; DISTRIBUTION UNLIMITED

The views expressed in this thesis are those of the author and do not reflect the official policy or position of the United States Air Force, Department of Defense, or the United States Government.

AN ELEVEN YEAR RETROSPECTIVE OF THE ACQUISITION REVIEW
JOURNAL

THESIS

Presented to the Faculty

Department of Systems and Engineering Management

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In Partial Fulfillment of the Requirements for the
Degree of Master of Science in Strategic Purchasing

Mitchell J. Elder, BA

Captain, USAF

March 2005

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AN ELEVEN YEAR RETROSPECTIVE OF THE ACQUISITION REVIEW
JOURNAL

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Approved:

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Abstract

This purpose of this study is to examine the evolution of the Acquisition Review Journal through its first eleven years in publication. Researchers will assess the Defense Acquisition community through a review of ARJ articles. It considers what areas academics and practitioners have explored and how they have done so. This review documents such characteristics as areas of study, methods of study, and contributors. Trends are identified and conclusions drawn as to the contribution of ARJ to the Defense Acquisition community of practice.

To Katherine

Acknowledgments

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Mitchell J. Elder

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AN ELEVEN YEAR RETROSPECTIVE OF THE ACQUISITION REVIEW JOURNAL

I. Introduction

Background

For the last several years, great emphasis has been placed on reforming Department of Defense (DoD) Acquisition practices. Several factors, including ever-changing threats and cuts to personnel and budgets, contribute to this increased emphasis.

In an effort to document and further acquisition reform throughout DoD, the Acquisition Review Journal (formerly Acquisition Review Quarterly) was established. In its inaugural issue, the Deputy Under Secretary of Defense for Acquisition Reform introduced the journal as one way to raise awareness of the Acquisition career field, arguing that greater awareness was a necessary step in furthering reform efforts (Preston 1994). Since then, ARJ has become the flagship professional publication of the Defense acquisition community.

Along with creating awareness in a particular field of study, journals also serve as a forum for intellectual exchange within a community of practice, and assessing the content of journals is one way to evaluate a discipline's intellectual health (Das and Handfield, 1997). The Acquisition Review Journal is a forum for intellectual exchange created specifically for DoD acquisition reform and therefore a study of its content could offer an appropriate assessment of DoD acquisition reform.

The purpose of this study is to examine the evolution of the Acquisition Review Journal through its first eleven years of existence. The study assesses the state of the Defense acquisition community of practice through a review of ARJ articles. It seeks to understand what areas academics and practitioners have explored and how they have done so. This review will document such characteristics as areas of study, methods of study, and contributors. Trends will be identified and conclusions drawn as to the contribution of ARJ to the Defense Acquisition community of practice.

History of Acquisition Review Journal

Researchers conducted a brief history of editors in the ARJ. Specifically, they looked at the editors over the initial eleven years and reviewed the changes in guidance provided for perspective authors. In eleven years of publishing the ARJ there have been four editors. Table 1 shows the journal editors and their term of editorship.

Table 1. Journal Editorship

Time Period	Editor
Winter 1994-Spring 1995	Robert W. Ball
Summer 1995-Fall 1997	James Kurt Wittmeyer
Winter 1997- Summer 2000	Deborah L. Gonzalez
Fall 2000-Present*	Norene L. Taylor**

*For the purpose of this study “present” is considered the end of 2004

** Norene L. Taylor is listed under the following surnames: Blanch, Fagan-Blanch, and Taylor.

Researchers also conducted a review of the various documents provided as guidance for authors in order to trace a history of submission requirements for contributions.

In the inaugural issue, Winter 1994, the Guidelines for Authors states that the ARJ is looking for articles that “represent scholarly examination, disciplined research and supported empirical experience in the fields of defense systems management and acquisitions management. Defense acquisition is the primary focus, but papers covering other fields of management will be considered.” In Summer 1994, editors published their Editorial Mission. The mission asserts the ARJ’s intentions and purpose of publishing articles and the type of information the ARJ will disseminate. The goal of the ARJ is stated in the excerpt below, taken from the Editorial Mission:

The primary goal of the Acquisition Review Quarterly (ARQ) is to provide practicing acquisition professionals with relevant management tools and information based on recent advances in policy, management theory, and research...and is intended to serve as a mechanism for fostering and disseminating scholarly research on acquisition issues, for exchanging opinions, for communicating policy decisions, and for maintaining a high level of awareness regarding acquisition management philosophies. The ARQ provides insight to the acquisition professional and others in the Department of Defense (DoD), Congress, industry and academe who have significant interest in how the DoD conducts its acquisition mission. (ARQ, 1994:3)

In the Summer 1995 issue, the ARJ simplified their requests for contributors by welcoming “anyone interested in the defense acquisition process.” It also asks for articles under specific heading types such as research, policy, and tutorials. In previous issues, these headings are not mentioned.

The Winter 1997 issue marked the first time the ARJ requested articles with a specific topic, as opposed to the previous suggestion of topic areas. This request was a call for manuscripts on Radical Change in Defense Acquisitions.

The Spring 1997 issue showed a turning point in the ARJ's guidelines for authors. The ARJ still stated that article submissions are welcome from anyone interested in defense acquisitions, but a list of examples follows. This list includes:

“conceptualization, initiation, design, development, test, contracting, production, deployment, logistic support, modification, and disposal of weapons and other systems, supplies, or other services to satisfy Defense Department needs, or intended for use in support for use in support of military missions.” The guidelines for this issue also include specific instructions on manuscript sections for each type of article (Research, Opinion, and Tutorial). This issue has more style guidance than any previous issue.

The most recent significant change in editorial guidelines occurred in the Winter 2003 issue; the ARJ Guidelines for Authors suggest that articles be co-authored to add depth, and that a mentor who has published before or has expertise in the subject area be selected to assist with the submission. This suggestion is reiterated in succeeding issues.

Research Problem

The ARJ has been in publication for eleven years as a way to exchange ideas within the defense acquisition community and to document the Acquisition Reform movement in the DoD. While each issue of the ARJ explores individual reform efforts and ideas, researchers could find nothing written to examine the journal as a whole. One article (Rogers and Birmingham, 2004) examined the history of acquisition reform

efforts, but this article focused mainly on what the authors consider “landmark documents.” The authors identified eight such documents they used to frame the reform process and examined reform efforts across several publications, not specifically the ARJ. This study seeks to systematically analyze the contributions of the ARJ in order to understand acquisition practice in the DoD.

Investigative Questions

Several research questions, based on the content analysis methodologies employed by Carter and Ellram (2003) and Das and Handfield (1997), have been developed to guide the study.

1. What subjects have been addressed in the ARJ? What do these topics suggest about acquisition reform in the DoD?
2. How have these subjects been explored?
 - a. What research methodologies have been used to explore the subjects, and to collect data?
 - b. What analytical techniques have been used on the data?
 - c. What do these findings suggest about the study of acquisition reform in the ARJ?
3. What authors have contributed articles to ARJ, and with what institutions are they affiliated? What does this suggest about the study of acquisition reform?

Methodology

Similar studies have contributed to the bodies of knowledge in related fields (Carter and Ellram 2003; Das and Handfield 1997). This study will loosely replicate the methodology employed by Carter and Ellram (2003) in their retrospective of the Journal of Supply Chain Management, and that used by Das and Handfield (1997) in their review of the Journal of Operations Management. Each article published in the ARJ will be carefully examined and classified based upon predetermined characteristics such as subject matter and methodology. Trends will be identified across characteristics as appropriate and conclusions will be drawn as to ARJ's contribution to the Defense Acquisition community of practice.

Proposed Study Contributions

The results may provide Acquisition professionals with a better understanding of how the journal has explored reform. The results will reveal the subjects that have been addressed in the ARJ, how the subjects were explored, how data was collected and analyzed, and who contributes to the ARJ. The results of this study might also be helpful in informing future authors how they can improve their research and publications, thus contributing to the advancement of knowledge about defense acquisitions. Finally, the results might provide some indications about where the Journal should go next.

Overview

This chapter introduced the specific area of study. It provided some background on the Acquisition Review Journal. Following the background, there was a brief discussion of the problems to be addressed in this study and some investigative questions. A proposed methodology was presented and study contributions were considered. The remainder of this thesis is structured as follows: Chapter Two will present the method, Chapter Three will present the analysis, and Chapter Four will present conclusions.

II. Methodology

Chapter two describes the methodology employed in this research project.

Research Design

This study was a systematic examination of the content of the ARJ (over the first eleven years of publication) using Content Analysis to identify patterns or themes. Open Coding was used to categorize the data and examine the data for properties and specific attributes (Leedy and Ormrod, 2001). There were 193 articles used in the study. These were journal articles found at www.dau.mil/pubs/arqtoc.asp. It is important to note that Editorial Introductions and Special Edition Introductions were not included in the data.

Article Subject Matter

Two researchers initially went through the text of all the articles in the journal. Each article was carefully scrutinized to identify subjects under which the article could be categorized. Where applicable, articles that had more than one conceivable subject category were coded with all possible subject categories. This review identified 126 possible subjects. Next, the researchers independently grouped the subjects based on common themes. This initial trial yielded 39 categories. The researchers then accomplished a second independent grouping in order to identify broader categories. This trial yielded a 70% agreement rate between coders. Differences in categorization were resolved through discussions in order to reach a consensus on the final 15 categories. The final subject categories were defined (see Table 2).

Table 2. Definitions of Subject Categories

Subject Categories	Definition
Management and Organizational Behavior	Concerns leadership/management theory, workforce development, and recruiting and retention
Organizational Issues	Concerns organizational restructuring and organizational strategy
Policy and Regulation	Encompasses acquisition regulation and public policy issues
Performance and Measurement	This category contains articles related to performance measurement and metrics
Buyer/Seller Relationships	Concerns supplier development, supply chain issues, and partnering
Research and Development	Entails subjects related to new research endeavors not directly related to interoperability or program fielding
Acquisition Strategy	Contains articles with big picture views in acquisition strategy such as outsourcing, privatization, and cooperative acquisitions
Interoperability	Includes technology integration, information technology, and system architecture and design
Risk Management	Contains articles related to risk management issues
Cost and Schedule	Concerns issues of cost and schedule such as growth and variance
Analysis and Decision Making	Articles related to analysis models in management decisions, cost analysis, and budgeting
Industry Issues	Includes articles addressing the defense industry and articles on commercial issues with a industry base focus
Reform Initiatives	Contains articles addressing acquisition reform such as best practices, efficiency initiatives, quality, and articles with commercial focus on reform
Program Fielding and Implementation	Articles concerned with program fielding and implementation issues such as field testing and battle labs
Contract Management	Articles related to contract management, contingency contracting, source selection decisions, acquisition planning, and contract incentives

Once the categories were defined, the researchers recoded each article into one of these final categories. Again, differences among researchers were resolved through

discussion. The data was compiled and tables were established in order to determine the relative frequency with which publications appeared over time. In order to gain a better insight of trends, researchers divided the eleven years into three periods. Period One covered Years 1 through 4 and contained 65 articles, Period Two contained Years 5 through 7 with 65 articles, and Period Three covered Years 8 through 11 with 63 articles. The data was then analyzed for trends across subject and time period.

Article Methodology

Articles were classified according to the methodology employed. Method categories used were based on those employed by Carter and Ellram (2003), who followed Mentzer and Kahn's (1995) typologies. Categories used include Type of Research Performed, Type of Design Employed, and Data Analysis Employed (Carter and Ellram, 2003).

Type of Research Performed

The articles were coded using Mentzer and Kahn's (1995) typology. This typology is based on five categories including: Normative Literature, Literature Reviews, Exploratory Studies, Methodology Reviews, and Hypothesis Testing. The coders reviewed the articles and determined which category was most appropriate for each article. Researchers then created a table displaying the frequency of articles per category. The data was compiled and tables were established in order to determine the relative frequency with which various methodologies were used over time. To gain a better insight of trends, researchers divided the eleven years into three periods. The data was

then analyzed for trends in Type of Research Performed over time. A description of Mentzer and Kahn's typology follows:

Normative Literature: "Research that examines what ought to be and what individuals and organizations ought to do" (Mentzer and Kahn 1995). "Literature might be cited in the article, but the point of the inclusion of this literature is to support the opinions/assertions of the author" (Carter and Ellram 2003).

Literature Reviews: "A review and synthesis of existing literature, the result of which is the development of a framework, propositions, or normative prescriptions grounded in the existing literature" (Carter and Ellram 2003).

Exploratory Studies: "Research that makes observations for the purposes of developing theories, but leaves the testing of the theories for other studies" (Mentzer and Khan 1995).

Methodology Reviews: "A review of research methodologies--a 'how-to' article. This type of research includes articles that review/introduce an academic research methodology as well as a practitioner methodology"(Carter and Ellram 2003).

Hypothesis Testing: "Articles that introduce and then test research hypotheses or propositions" (Carter and Ellram 2003).

Research Design Employed

The articles were coded according to type of design employed and charted on a graph to reveal trends. Articles were classified into one of eight research designs that were adapted from Carter and Ellram (2003): Archival studies, Interviews, Topic Presentations, Case Study(ies), Experiments, Focus groups, Mathematical Modeling, and Surveys. These categories are defined in Table 3.

Table 3. Definitions of Research Design Categories

Design	Definition
Topic Presentation	Articles contain no discernable design methodology. Authors present subject matter without explaining methodology
Archival	Data gathered from collective works
Case Study	In-depth data are gathered pertaining to a program or event
Interviews	Data collected through the use of interviews
Surveys	Data collected through the use of surveys
Experiment	Data collected through an experimental process
Mathematical Modeling	Data collected using mathematic modeling

The coders reviewed the articles and determined which category was most appropriate for each article based on the definitions presented in Table 3. The data was compiled and tables were established in order to determine the relative frequency with which various research designs were used over time. To gain a better insight of trends, researchers divided the eleven years into the same three periods discussed above. The data was then analyzed for trends in type of design over time. Initially a chi-square test was run to determine whether changes were significant, however a “warning” message

appeared stating that more than 20% of all data fields registered less than five occurrences. Therefore, since the results of the chi-square analysis were dubious, the researchers did not rely on these results.

Analysis Employed

The articles were then organized according to type of data analysis applied. Nine types of data analysis were used as categories. These categories, adapted from Carter and Ellram (2003), include: No analysis, Anecdotal, ANOVA, Comparative Analysis, Content analysis, Correlation Analysis, Descriptive Statistics, Factor Analysis, and Regression. These categories are defined in Table 4. When researchers looked at the types of analyses performed over the eleven years, there was little representation (10 articles) from four categories. Researchers grouped these four categories with Descriptive Statistics under a new category called “Statistical Analysis” as they are all various methods of statistical analysis. The five subcategories in Statistical Analysis are Factor Analysis with 5 articles, ANOVA with only one article, Regression with also with only one article, Correlation Analysis with 3 articles, and Descriptive Statistics with 21 articles—for a total of 31 articles. Again, the data was broken into three time periods and analyzed based on frequency and percentage per time period. Initially a chi-square test was run in order to determine whether changes were significant, however a “warning” message appeared stating that more than 20% of all data fields registered less than five occurrences. Again, with the results of this analysis in question, researchers chose not to rely on them.

Table 4. Definitions of Analysis Categories

Analysis	Definition
No Analysis	No discernable analysis conducted for the article
Anecdotal	Based on incidental observations or reports rather than on systematic evaluation
Content Analysis	A detailed systematic evaluation of a particular body of material for the purpose of identifying patterns, themes, or biases
Comparative	Utilizing comparison as a method of analysis (e.g. outlining results with a comparison between DoD Restructuring to that of a civilian organization)
Statistical Analysis	Uses statistical methods to analyze data. These methods include ANOVA, correlation analysis, regression analysis, descriptive statistics, and factor analysis

Institutional and Individual Contributions

The ARJ is the primary intellectual forum for the Defense Acquisitions community. The primary contributors to this forum are the authors and the institutions they represent. Researchers looked at three aspects of contribution: institution, author, and number of authors per article. An examination of institutions will determine whether articles were of an academic or practical nature and if they came from a government or civilian perspective. Examining author production will give some indication of thought leaders within the community. Researchers also looked at the number of authors per article to determine if there was a trend. This information will provide some indication about the type of article being produced in the ARJ.

To discover trends among institutional contributions, researchers reviewed articles' author biographies. On the first trial, article institutions were collected. Some institutional information from biographies was incomplete or vague, so researchers made

subjective decisions on institutional contribution based on the available information. For example, an article may state that the author was currently at one location, but recently graduated from a military institution such as AFIT. In this instance researchers surmised that the article was produced at AFIT and so the article was coded as such. At this time, researchers created institutional category groupings and recoded the articles accordingly into these categories. The institutional categories are defined in Table 5. The data was then compiled and grouped into three time periods and analyzed based on frequency and percentage per time period. The data was reviewed to reveal trends.

Table 5. Definitions of Institutional Categories

Institutional Category	Definitions
Civilian Universities	All public civilian institutions of higher education
DSMC/DAU	Articles published by students or faculty at Defense Systems Management College or Defense Acquisition University. Provides practitioner training, career

	management, and services to the Acquisition Technology, and Logistics community
Civilian Research Firm/ Defense Contractor	Any civilian research firms or contractors (e.g. RAND, Boeing, MITRE)
Other USAF	Non academic Air Force institutions (e.g. C-17 SPO)
Other USA	Non academic Army institutions (e.g. US Army Test and Evaluation Command)
ICAF	Students or faculty at Industrial College of the Armed Forces. ICAF is an executive education program for select upper-middle managers in the Air Force and Allied services
NPS	Students or faculty at the Naval Post Graduate School. Military Post-graduate educational institute
AFIT	Students or faculty at the Air Force Institute of Technology. Military Post-graduate educational institute
SECDEF	All Articles originating from either the office of the Secretary of Defense or one of the various Under Secretaries of Defense
USAFA	Students or faculty of United States Air Force Academy. Military undergraduate educational institution
Other USN	Non academic Naval Institutions (e.g. SPAWAR)
Other DoD	Non academic Department of Defense Institutions which cannot be attributed to one of the services (e.g. Defense Logistics Agency)
National Defense University	Students or Faculty of the National Defense University. A center for joint professional military education
ACSC	Students or faculty of the Air Command Staff College. Professional military education institution geared towards junior field grade officers
Air War College	Students or faculty of Air War College. Professional military education institution geared towards upper-middle managers
Other Gov	Originates from non-DoD organizations
USMA	Students or faculty of United States Military Academy. Military undergraduate educational institution
Naval War College	Students or faculty of Naval War College. Professional military education institution geared towards upper-middle managers

In order for researchers to determine individual contributions, articles per author were counted and a frequency table was created. Subsequent analysis evaluated any trends in these areas. A count of authors per articles was then compiled and an analysis

of variance (ANOVA) was performed to determine whether the mean number of authors per article varied over time.

Overview

This chapter described the methodology employed in this research project. Chapter three will present the analysis results.

III. Results and Analysis

Introduction

Chapter Three reports the analysis of the data in order to answer the investigative questions. This chapter examines subject categories, the type of research, the research design, and the analysis employed. It also discusses some trends in contributing institutions and contributing authors.

Research and Investigative Questions:

This section reviews the analysis of each investigative question. The first question asks what subjects have been addressed. The second question asks what the methods are by which investigators have studied the subjects. The final question asks what authors have contributed to the ARJ, and with what institutions are they affiliated.

1. What subjects have been addressed in the ARJ? What do these topics suggest about acquisition reform in the DoD?

An examination of article subjects will determine what the ARJ has presented and will illuminate the topics that are important to the Defense Acquisition community.

Subject Categories

The graphs below show the results of subject coding of articles from the eleven years of ARJ. Figure 1 depicts a graphical representation of the number of articles within each category, in ascending order.

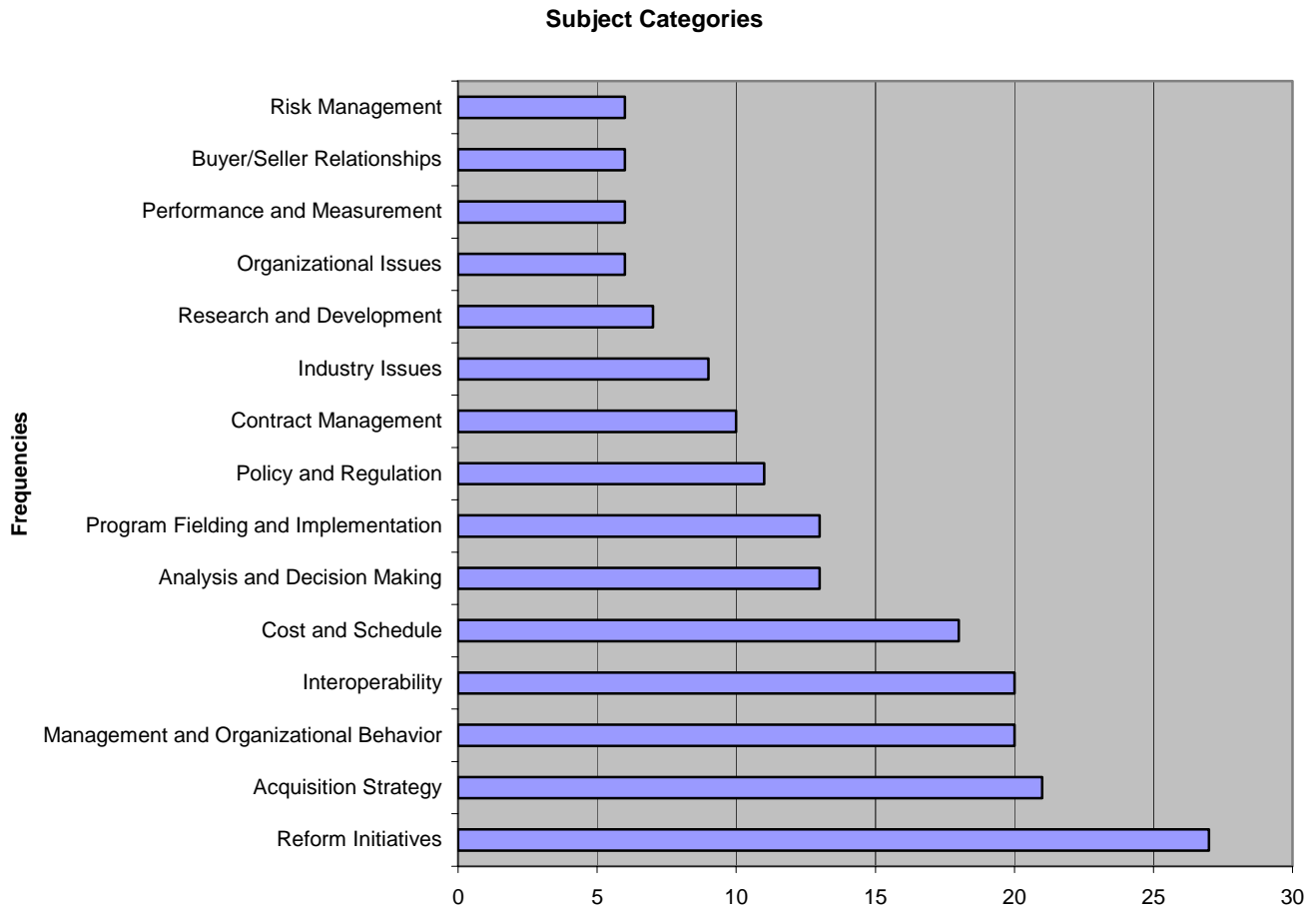


Figure 1. Frequency of Articles per Subject Category

Table 6 shows the number of articles in a given category and the percentage of the articles per category, per year.

Table 6. Frequency and Proportion of Subject Category per Period

	1	2	3	
Reform Initiatives	9	11	7	27
Acquisition Strategy	6	9	6	21
Management and Organizational Behavior	3	7	10	20
Interoperability	4	6	10	20
Cost and Schedule	7	7	4	18
Analysis and Decision Making	6	6	1	13
Program Fielding and Implementation	4	5	4	13
Policy and Regulation	9	2	0	11
Contract Management	5	2	3	10
Industry Issues	2	1	6	9
Research and Development	3	2	2	7
Organizational Issues	2	3	1	6
Performance and Measurement	2	2	2	6
Buyer/Seller Relationships	2	2	2	6
Risk Management	1	0	5	6
	65	65	63	

	1	2	3
Reform Initiatives	13.8%	16.9%	11.1%
Acquisition Strategy	9.2%	13.8%	9.5%
Management and Organizational Behavior	4.6%	10.8%	15.9%
Interoperability	6.2%	9.2%	15.9%
Cost and Schedule	10.8%	10.8%	6.3%
Analysis and Decision Making	9.2%	9.2%	1.6%
Program Fielding and Implementation	6.2%	7.7%	6.3%
Policy and Regulation	13.8%	3.1%	0.0%
Contract Management	7.7%	3.1%	4.8%
Industry Issues	3.1%	1.5%	9.5%
Research and Development	4.6%	3.1%	3.2%
Organizational Issues	3.1%	4.6%	1.6%
Performance and Measurement	3.1%	3.1%	3.2%
Buyer/Seller Relationships	3.1%	3.1%	3.2%
Risk Management	1.5%	0.0%	7.9%

The top five article categories including Reform Initiatives, Acquisition Strategy, Management and Organizational Behavior, Interoperability, and Cost and Schedule

comprised 55% of all articles over the eleven years of publication. As expected for a journal covering acquisition reform, Reform Initiatives was the most popular subject with 27 occurrences, about 14% of all articles published in the eleven years of ARJ.

Acquisition Strategy has 21 total occurrences including six articles in the first period, nine in the second period, and six in the third period. To discover what the peak in the second period might mean, researchers reviewed articles in this time period and found that all articles on Acquisition Strategy in Period Three were on various topics and were focused on different issues. There was no discernable connection between the articles to explain the relatively higher concentration in this time period, so researchers explained the peak as coincidence. The two categories Management and Organizational Behavior and Interoperability were tied for third with 20 articles on their subject over the eleven years. Management and Organizational Behavior saw a rise in time periods two and three. Although the number of articles on this subject increased in these time periods, researchers found no systematic explanation for the spike. Articles on Interoperability totaled 20. This category has been steadily rising from four articles in the first period to six articles in the second period, then up to ten articles by the third period. Researchers attribute this rise to a greater reliance on computers and technology. Finally Cost and Schedule, which comprised of approximately 9% of all articles in the ARJ, drops from seven articles in the first and second periods to only four articles in the last period.

The drop in articles in the Policy and Regulation subject category is an interesting trend. In the first period Policy and Regulation is at 13.8% of all articles. By Period Two this category dramatically drops to just of over 3% and becomes nonexistent by Period Three.

The only other dramatic spike that appears in Table 6 was found in the Risk Management category. The spike in the number of articles published appeared in the third period with five occurrences. Only one other article for Risk Management had been published prior to Period Three. This increase in interest is accounted for by Special Edition 34, published in Summer 2003, which specifically addressed the issue of Risk Management.

2. The next question addresses the methods by which investigators have studied the subjects. Specifically, it asks how these subjects have been explored.
 - a. What research methodologies have been used to explore the subjects, and to collect data?
 - b. What analytical techniques have been used on the data?

Researchers looked at three aspects of article methodology including: Type of Research, Research Design (data collection), and Data Analysis Employed.

Type of Research Performed

Type of research was analyzed using the categories defined in Chapter 2. Table 7 depicts the frequency and proportion of articles per Type of Research category, per time period.

Table 7. Frequency and Proportion of Type of Research

Type	1	2	3	
Normative	29	30	21	80
Methodology	21	22	24	67
Exploratory	11	10	12	33
Hypothesis	2	2	4	8
Literature	2	1	2	5
	65	65	63	

Type	1	2	3
Normative	44.6%	46.2%	33.3%
Methodology	32.3%	33.8%	38.1%
Exploratory	16.9%	15.4%	19.0%
Hypothesis	3.1%	3.1%	6.3%
Literature	3.1%	1.5%	3.2%

Normative research made up approximately 41% of articles. Methodology Reviews accounted for approximately 35% of the articles and Exploratory Studies for 17% the articles. Hypothesis Testing only made up about 4% and Literature Reviews, with the fewest occurrences, accounted for just 2.5% of the articles. The only significant trend in this data was that by Period Three Normative Literature dropped from roughly 45% in the first two periods down to about 33% by the third period.

Research Design Employed

Articles were analyzed to determine the most commonly used research designs, according to the framework described in Chapter Two. Table 8 depicts the frequency and proportion of articles per Research Design, per time period.

Table 8. Frequency and Proportion of Research Design Design

	1	2	3	
Topic Presentation	32	31	25	88
Archival	19	14	14	47
Case Study	9	9	14	32
Interviews	4	2	4	10
Surveys	1	7	3	11
Experiment	0	2	2	4
Mathematical Modeling	0	0	1	1
	65	65	63	

Design	1	2	3
Topic Presentation	49.2%	47.7%	39.7%
Archival	29.2%	21.5%	22.2%
Case Study	13.8%	13.8%	22.2%
Interviews	6.2%	3.1%	6.3%
Surveys	1.5%	10.8%	4.8%
Experiment	0.0%	3.1%	3.2%
Mathematical Modeling	0.0%	0.0%	1.6%

Topic Presentation makes up approximately 45%, Archival design, 24%; Case studies, 16%; Surveys, 6%; Interviews, 5%, and Experiments, 2%. There was also one article with Mathematical Modeling--making up only 0.5% of all articles. In Table 8, Design is depicted in three time periods comprised of equal numbers of articles: the first four years in Time period 1, the following three years in Time period 2, and the last four years in Time period 3. Here, Topic Presentation and Archival Designs were very common in the earliest time period making up 78.4% of all articles published. By the third time period, Topic Presentation was still the most common type of design, but Case Studies had become as common as Archival Design--for the second most common design type.

Analysis Employed

There were initially nine types of analysis employed, however, when researchers looked at the types of analyses performed over the eleven years, there was little representation (ten articles) from four categories. Researchers grouped these four categories with Descriptive Statistics under a new category called “Statistical Analysis” as they are all various methods of statistical analysis. The five subcategories in Statistical Analysis are Factor Analysis with 5 articles, ANOVA with only one article, Regression with also with only one article, Correlation Analysis with 3 articles, and Descriptive Statistics with 21 articles--for a total of 31 articles. Once this adjustment was made to the categories, researchers created Table 9 to review the data and identify trends over time. Table 9 depicts the frequency and proportion of articles per Analysis Employed, per time period.

Table 9. Frequency and Proportion of Analysis Employed

Analysis	1	2	3	
No Analysis	29	27	26	82
Anecdotal	17	13	14	44
Content Analysis	10	5	7	22
Comparative	5	6	3	14
Statistical Analysis	4	14	13	31
	65	65	63	

Analysis	1	2	3
No Analysis	44.6%	41.5%	41.3%
Anecdotal	26.2%	20.0%	22.2%
Content Analysis	15.4%	7.7%	11.1%
Comparative	7.7%	9.2%	4.8%
Statistical Analysis	6.2%	21.5%	20.6%
	1	1	1

In Table 9 researchers saw that No Analysis made up a large percentage of articles per year, however in year 11, No Analysis is tied for lowest occurrences with Comparative Analysis at only 7.7%. Researchers define the “No Analysis” category to mean that the article contained no discernable analysis. It is also interesting to see that in the last two time periods of the ARJ, Statistical Analysis is steadily making up larger percentages of articles published.

3. What authors have contributed articles to ARJ, and with what institutions are they affiliated?

An examination of institutions will determine whether articles were of an academic or practical nature and if they came from a government or civilian perspective.

Examining author production will give some indication of thought leaders within the community.

Contributing Authors

Researchers plotted the author’s data onto the charts below to reveal trends. Researchers included information on how many articles were contributed by each author and how many authors there were per article over the eleven years of publication. Table 10 presents the top twelve contributing authors from Years 1 through 11.

Table 10. Top Contributors

AUTHORS	CONTRIBUTIONS
Christensen, David Ph.D.	6*
Nissen Dr. Mark E.	5
Washington, William N.	5
Alford, Lt Col Lionel D. Jr.	4
Arora Ashish	3
Besselman, Maj Joseph USAF	3
Driessnack, Lt Col John D.	3
Larkey Patrick	3
Linster Bruce G.	3
Pollock, Neal	3
Snider Dr. Keith F.	3
Templin, Carl Ph.D.	3

*Note: This includes an issue introduction

Table 11 shows the proportion of authors per article over the 11 years of publication.

Table 11. Authors per Article

Year	Mean	One Author	Two Authors	Three Authors	Four Authors
1	1.16667	83.3%	16.7%	0.0%	0.0%
2	1.25	72.7%	18.2%	9.1%	0.0%
3	1.18182	81.8%	18.2%	0.0%	0.0%
4	1.76	60.0%	8.0%	28.0%	4.0%
5	1.66667	57.1%	23.8%	14.3%	4.8%
6	1.65217	56.5%	26.1%	13.0%	4.3%
7	1.68182	68.2%	9.1%	9.1%	13.6%
8	1.28571	78.6%	14.3%	7.1%	0.0%
9	2.21053	31.6%	26.3%	31.6%	10.5%
10	1.76471	52.9%	17.6%	29.4%	0.0%
11	2.15385	23.1%	38.5%	38.5%	0.0%

Researchers looked at the number of contributing authors per article. This data revealed that the number of authors per article appeared to increase significantly since the beginning of publication in 1994. In the first year, a large majority of articles were written by one author with only 16.7% of articles written by two authors. In Year 4, researchers saw that there was a significant increase in multiple authors with 32% of articles having three or more authors. Year 9 saw a first, where multiple authored articles out-numbered single authored articles. By Year 11, only 23.1% of all articles were written by one contributing author. In order to run an ANOVA, data was grouped into the three time periods as established above. The results suggest a statistically significant overall difference across time periods ($P > F 0.0205$). Carter and Ellram found a similar trend in their study of the Journal of Supply Chain Management where the average number of authors per article rose over time (2003).

Contributing Institutions

Researchers looked at contributing institutions as well as contributing authors.

Table 12 shows the proportion of articles per contributing institutions, per time period.

Table 12. Proportion of Contributing Institutions

	1	2	3
Civilian Universities	14.1%	24.0%	28.6%
DSMC/DAU	19.7%	12.0%	10.4%
Civilian Research Firm/ Defense Contractor	9.9%	12.0%	19.5%
Other USAF	1.4%	16.0%	10.4%
Other USA	12.7%	6.7%	7.8%
ICAF	12.7%	2.7%	2.6%
NPS	4.2%	8.0%	3.9%
AFIT	9.9%	2.7%	2.6%
SECDEF	5.6%	5.3%	1.3%
USAFA	4.2%	1.3%	3.9%
Other USN	1.4%	5.3%	2.6%
Other DoD	2.8%	0.0%	1.3%
National Defense University	1.4%	0.0%	1.3%
ACSC	0.0%	1.3%	1.3%
Air War College	0.0%	1.3%	0.0%
Other Gov	0.0%	1.3%	0.0%
USMA	0.0%	0.0%	1.3%
Naval War College	0.0%	0.0%	1.3%

As previously seen with Research Design and Analysis Employed, the analysis of institutions was also aggregated into three time periods. Table 12 shows the percentages of institutional contributions over the three time periods. Here, researchers could see that contributions by civilian universities were on the rise from 14.1% in Period 1 to 28.6% by Period 3. Contributions by civilian research firms and defense contractors were also on the rise from almost 10% in Period 1 to 19.5% by Period 3. While the civilian institutions are rising, some government institutions' contributions appear to be

declining. For example, DSMC/DAU fell from almost 20% in Period 1 to 10.4% in Period 3. Contributions from AFIT fell dramatically from 10% of contributions in Period 1 to not even 3% in Periods 2 and 3. Other interesting rises and falls are seen in Army, Navy, and Air Force contributions. Air Force contributions jumped from 1.4% of institutional contributions in Period 1 to 16% in Period 2, followed by a decline in Period 3 to 10.4%. Another jump, followed by a fall, is seen in Navy contributions with 1.4% to 5.3%, then falling in Period 3 to 2.6% of institutional contributions. Army institutions, however, showed a different trend; in Period 1 they contributed almost at 13% of articles, then in the last two periods their contributions were in the 7-8% range.

Table 13 depicts the percentage of articles published by civilian organizations against government organizations. It also shows practitioner organizations against academic organizations.

Table 13. Proportion of Civilian vs. Government Organizations

Contributor Type	1	2	3
Civilian Organizations	23.9%	36.0%	48.1%
Military Organizations	76.1%	64.0%	51.9%

Table 14. Proportion of Practitioners vs. Academics

Contributor Type	1	2	3
Practitioners	66.2%	53.3%	55.8%
Academics	33.8%	46.7%	44.2%

These percentages reveal that government organizations consistently make up the larger percent of contributions in all three time periods. There was, however, an upward

trend in the contributions from civilian institutions. By Period 3 civilian contributions were at 48.1% and government contributions were at 51.9%.

There was a similar trend in the contributions from practicing institutions and academic institutions. The first period shows that academic institutions only accounted for about a third of the contributions, however by Period 3 they accounted for 44.2% of all contributions.

Overview

This chapter reported the analysis of the data used to answer the investigative questions. It examined subject category, the type of research, the research design, and the analysis employed. It also discussed some trends in contributing institutions and contributing authors. Chapter Four will present the conclusions of the study

IV. Conclusions

Introduction

This chapter will present the conclusions of the study. It will address the research problem by discussing the results in terms of the investigative questions. Researchers begin by restating the research problem and then present the findings with regards to the individual investigative questions.

From the beginning, the ARJ has established itself as a journal that exchanges ideas within the defense acquisition community and it has become a place to document the Acquisition Reform Movement in DoD. For this study, researchers set out to trace the history of the Acquisition Reform Movement. To first examine the health of the reform movement, the ARJ needed to be assessed as a whole.

Discussions

The first investigative question researchers looked at was subject category. In a systematic effort to understand the topics of interest in the ARJ, researchers reviewed the articles in the first eleven years and charted the occurrences of each specific subject.

The ARJ had several interesting trends in subjects addressed. This study particularly looked at the top five article categories including Reform Initiatives, Acquisition Strategy, Management and Organizational Behavior, Interoperability, and Cost and Schedule. These five subject categories account for more than half of the articles in the ARJ. Because the journal's title, researchers expected to find many of the articles in the Acquisition Strategy and Reform Initiatives categories. Researchers were not surprised when these two categories rated at the top, making up about 25% of all

articles. Another category in the top five was Management and Organizational Behavior which saw a rise in every time period. The subject category for Interoperability is also on the rise. Researchers attribute this to a greater reliance on computers and technology. Cost and Schedule, which comprised of approximately 9% of all articles in the ARJ, has seen a slight decline in number of articles in this subject category.

Some of the other noteworthy subject article trends are Policy and Regulation and Risk Management. In the Policy and Regulation category, there was a dramatic reduction of articles in the ARJ from Periods One to Three. The Risk Management category, on the other hand, saw a dramatic spike in Period Three (Year 10). This is accounted for by Special Edition 34, published in Summer 2003.

From the researchers' perspective it is impossible to determine what was driving article selection for the ARJ. Obviously, the type of article submitted for consideration for publication was driven primarily by potential authors aware of the journal. In turn, the editorial staff acted as a gate-keeper and determined which articles actually made it to publication. In some instances, editors took a more proactive stance by initiating special topics for certain issues, such as Risk Management (mentioned previously in Chapter Three). This was an effective way to guide the subject matter addressed in the journal. It would seem feasible that the editorial staff could generate enough interest in a particular topic to fill an entire issue. In doing so, the journal could continue to address the issues that naturally flow from the acquisition community. In addition to this, editors could identify 'hot-topics' and guide the direction of journal content.

The second investigative question sought to explore the methods with which ARJ authors have approached the subject areas. This was studied by an examination of the

type of research used in articles, how authors were gathering data, and how that data was being analyzed.

Researchers made the following observations about the three characteristics they explored with regards to methodology:

- More than three quarters of all articles had either Normative Literature or Methodology Review as their type of research. The remaining 25% were either Exploratory, Hypothesis Testing, or Literature Review.
- In addition to this, nearly half of all articles had Topic Presentation as their research design. Fewer than 15% of all articles had a design that could be considered research.
- Topic Presentation as a research design saw fewer and fewer articles. Researchers interpret this as an indication that from one period to the next, articles in the ARJ were becoming more structured.

When researchers considered contributing institutions they noted a tendency in the ARJ to publish more articles from practitioners rather than academics. Coupled with the predominance of articles not grounded in research, it seems clear that the intended audience is the practitioner. This is consistent with the Editorial Mission as discussed in Chapter One. There could be an argument that the journal would benefit from a stronger focus on academic research. The problem with this is that ARJ could run the risk of climbing too high in the 'ivory tower' and in doing so, forget its audience. Still, researchers feel that there is an appropriate balance between academics and practitioners,

as well as an appropriate amount of research articles. In reference to trends noted in Chapter Three, it is apparent that the journal is working towards this balance.

The third investigative question sought to explore the origins of articles published in the ARJ. An examination of contributing authors and institutions showed some interesting trends, and two areas that appeared especially significant. The first was the ratio of practitioner to academic contributors, and the second was the ratio of civilian to government contributors.

In Period One, researchers noted that academics, that is, members of an academic institution, made up only about one third of all contributors. By Periods Two and Three this number was up around 45%. While the journal's contributors were predominantly from practitioner institutions—those whose members are engaged in applying knowledge rather than creating it—in the first period, by the third period academics made up nearly half of the institution contributions. Researchers see this as a good sign that academics are taking a larger role in the ARJ.

In the first period, civilian institutions made up only about one quarter of all contributions. In the second time period they made up over a third of contributions, and rising to just shy of half of the contributions by the last time period. Again, researchers see this as a positive trend, in which civilian institutions are becoming a bigger part of the ARJ community.

These trends allow for the ARJ to develop a broader perspective and a deep vein of knowledge from a variety of different areas.

Limitations of Research

The two main limitations of this research were the investigator and the method. As the methodology was subjective in nature, there were a number of opportunities for the mistaken interpretation of the articles.

Future Research

There are a few recommendations for future research stemming from this study.

Future researchers should consider the following recommendations:

- A study replicating this methodology utilizing multiple coders
- A more detailed study of the articles contained in the ARJ.
- A study to determine causality of the trends identified.

Overview

This study examined the evolution of the Acquisition Review Journal through its first eleven years in publication. Researchers assessed the Defense acquisition community through a review of ARJ articles. It considered what areas academics and practitioners have explored and how they have done so. This review documented such characteristics as areas of study, methods of study, and contributors. Trends were identified and conclusions drawn as to the contribution of ARJ to the Defense Acquisition community of practice.

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Vita

Captain Mitchell J. Elder graduated from Bishop John McNamara High School in Forestville, Maryland. He received a Bachelor of Arts in History from Wright State University of Dayton, Ohio in June 1999 and was commissioned through the AFROTC Detachment 643.

His first assignment was at Wright-Patterson AFB, Ohio as an Airfield Operations Officer in August 1999. In April 2000, he was assigned to the 71st Training Wing at Vance AFB, Oklahoma as a student in Undergraduate Pilot Training. He was then assigned to the 9th Contracting Squadron at Beale AFB, California. While stationed at Beale, he deployed overseas in June 2002 through September 2002 to Riyadh, Kingdom of Saudi Arabia as Contingency Contracting Officer. He deployed again in February 2003 through July 2003 as the Squadron Commander of the 384th Expeditionary Contracting Squadron, Sheikh Isa, Kingdom of Bahrain. In August 2003, he entered the Graduate School of Engineering and Management, Air Force Institute of Technology. Upon graduation, he will be assigned to Lackland AFB, Texas as Commodity Director, Security Forces Commodity Council.

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