



# EXCERPT FROM THE PROCEEDINGS

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## OF THE NINTH ANNUAL ACQUISITION RESEARCH SYMPOSIUM THURSDAY SESSIONS VOLUME II

### **Services Supply Chain in the Department of Defense: Drivers of Acquisition Management Practices in the Army**

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**Naval Postgraduate School**

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| 14. ABSTRACT<br><b>In this research, we reviewed contract files and interviewed subject-matter experts to collect and analyze data regarding the Army's contract and management practices in the acquisition of services. We examined 154 contracts for four specific service types at eight U.S. Army Mission and Installation Contracting Command (MICC) organizations. The goal was to answer three research questions: (1) Do the contract characteristics differ for different types of services? (2) Do the types of services being acquired affect the management practices being used? (3) Does the capacity for carrying out acquisition-related work affect the management practices being used? The evaluation of the six contract characteristics revealed that a relationship does exist between service type and three of the contract characteristics: contract cost, number of modifications, and contract award strategies. The evaluation of the 13 management practices showed that there exists a relationship between service type and five of the management practices: the use of independent government estimates (IGE), the number of personnel assigned to a contract, the officer serving as the acquisition lead, the use of a quality assurance surveillance plan (QASP), and the use of an IGE for contracts valued over the simplified acquisition threshold. Our research findings also suggested that a relationship does exist between capacity and management practices and that further research is needed to confirm this relationship. Based on the findings of our research, we make several specific recommendations to the U.S. Army MICC for improving the efficiency and effectiveness in the acquisition of these four specific service types.</b> |                                    |                                     |                                                           |                                                     |                                 |
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## Preface & Acknowledgements

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Welcome to our Ninth Annual Acquisition Research Symposium! This event is the highlight of the year for the Acquisition Research Program (ARP) here at the Naval Postgraduate School (NPS) because it showcases the findings of recently completed research projects—and that research activity has been prolific! Since the ARP's founding in 2003, over 800 original research reports have been added to the acquisition body of knowledge. We continue to add to that library, located online at [www.acquisitionresearch.net](http://www.acquisitionresearch.net), at a rate of roughly 140 reports per year. This activity has engaged researchers at over 60 universities and other institutions, greatly enhancing the diversity of thought brought to bear on the business activities of the DoD.

We generate this level of activity in three ways. First, we solicit research topics from academia and other institutions through an annual Broad Agency Announcement, sponsored by the USD(AT&L). Second, we issue an annual internal call for proposals to seek NPS faculty research supporting the interests of our program sponsors. Finally, we serve as a “broker” to market specific research topics identified by our sponsors to NPS graduate students. This three-pronged approach provides for a rich and broad diversity of scholarly rigor mixed with a good blend of practitioner experience in the field of acquisition. We are grateful to those of you who have contributed to our research program in the past and hope this symposium will spark even more participation.

We encourage you to be active participants at the symposium. Indeed, active participation has been the hallmark of previous symposia. We purposely limit attendance to 350 people to encourage just that. In addition, this forum is unique in its effort to bring scholars and practitioners together around acquisition research that is both relevant in application and rigorous in method. Seldom will you get the opportunity to interact with so many top DoD acquisition officials and acquisition researchers. We encourage dialogue both in the formal panel sessions and in the many opportunities we make available at meals, breaks, and the day-ending socials. Many of our researchers use these occasions to establish new teaming arrangements for future research work. In the words of one senior government official, “I would not miss this symposium for the world as it is the best forum I've found for catching up on acquisition issues and learning from the great presenters.”

We expect affordability to be a major focus at this year's event. It is a central tenet of the DoD's Better Buying Power initiatives, and budget projections indicate it will continue to be important as the nation works its way out of the recession. This suggests that research with a focus on affordability will be of great interest to the DoD leadership in the year to come. Whether you're a practitioner or scholar, we invite you to participate in that research.

We gratefully acknowledge the ongoing support and leadership of our sponsors, whose foresight and vision have assured the continuing success of the ARP:

- Office of the Under Secretary of Defense (Acquisition, Technology, & Logistics)
- Director, Acquisition Career Management, ASN (RD&A)
- Program Executive Officer, SHIPS
- Commander, Naval Sea Systems Command
- Program Executive Officer, Integrated Warfare Systems
- Army Contracting Command, U.S. Army Materiel Command



- Office of the Assistant Secretary of the Air Force (Acquisition)
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- Director, Office of Acquisition Resources and Analysis (ARA)
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- Director of Open Architecture, DASN (RDT&E)
- Program Executive Officer, Littoral Combat Ships

We also thank the Naval Postgraduate School Foundation and acknowledge its generous contributions in support of this symposium.

James B. Greene Jr.  
Rear Admiral, U.S. Navy (Ret.)

Keith F. Snider, PhD  
Associate Professor



## Panel 16. DoD Services Contracting: Trends and Characteristics

| Thursday, May 17, 2012 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 9:30 a.m. – 11:00 p.m. | <p><b>Chair: Mr. Richard T. Ginman</b>, Director, Defense Procurement and Acquisition Policy</p> <p><b>Discussant: Alan Chvotkin Esq.</b>, Executive Vice President and Counsel, Professional Services Council</p> <p><b><i>U.S. Department of Defense Services Contract Spending and the Supporting Industrial Base, 2000–2011</i></b><br/>David Berteau, Guy Ben-Ari, Greg Sanders, David Morrow, and Jesse Ellman, <i>Center for Strategic and International Studies</i></p> <p><b><i>Services Supply Chain in the Department of Defense: Drivers of Acquisition Management Practices in the Army</i></b><br/>Rene Rendon, Uday M. Apte, and Aruna Apte<br/><i>Naval Postgraduate School</i></p> |

**Richard T. Ginman**—Mr. Richard T. Ginman assumed the position of director of defense procurement and acquisition policy (DPAP) in June 2011. In that capacity he is responsible for domestic, international, and contingency contract policy, acquisition policy and oversight of DoD 5000.1 and 5000.2, oversight of the DFARS and the DoD member of the FAR council, program development and implementation with regard to e-business, and, finally, oversight of the purchase card program. He also serves as co-leader and proponent of the pricing and contracting community within the DoD.

He assumed the position of DPAP in March 2010. In February 2008 he assumed the position of principal deputy to the director of DPAP. In that capacity, he is the principal advisor to the director for all contracting and procurement policy areas, including program acquisition strategies, incentives, program execution, peer reviews, contingency contracting, and acquisition policy.

Mr. Ginman has more than 37 years of experience in government and commercial business in the fields of contracting, acquisition management, logistics, and financial management. Among his previous assignments, he has been the vice president, Maritime Information Systems for General Dynamics Advanced Information Systems; director of contracts, Digital System Resources; commander, Navy Exchange Service Command; deputy for acquisition and business management for the assistant secretary of the Navy (RD&A); and deputy commander for contracts, Naval Sea Systems Command.

Throughout his career, Mr. Ginman has led large organizations with complex budget and fiscal challenges during periods of substantial change. In addition to the positions above Mr. Ginman's extensive work experience includes tours at the Naval Ordnance Systems Command; Naval Sea Systems Command; Naval Air Systems Command; Naval Regional Contracting Office, Long Beach; Long Beach Naval Shipyard; Office of the Secretary of Defense; and U.S. Embassy, Morocco. In addition he has served on USS *Puffer* (SSN 652), USS *Ranger* (CV 61), and USS *Hunley* (AS 31).

Mr. Ginman was commissioned an ensign in the Supply Corps, United States Navy in 1970 and retired as a rear admiral in 2000. He received a Bachelor of Arts degree from Williams College, a Master of Business Administration degree from George Washington University, and attended the University of Southern California's Executive Program in Business Administration. He has received



the Office of the Secretary of Defense Medal for Exceptional Civilian Service (2009, 2011). His personal military awards include the Defense Superior Service Medal, Legion of Merit, Defense Meritorious Service Medal, Meritorious Service Medal, and Navy Commendation Medal.

**Alan Chvotkin**—Chvotkin is one of the most knowledgeable and respected experts on federal acquisition policy, legislation, and regulation. At Professional Services Council (PSC), he is responsible for the association's legislative and regulatory policy affecting PSC's membership. Chvotkin is an active and founding member of the industry's Acquisition Reform Working Group, which was established in 1993.

In his early career, Chvotkin served as professional staff to the Senate Budget Committee and to the Senate Governmental Affairs Committee. He became counsel and staff director to the Senate Small Business Committee and then counsel to the Senate Armed Services Committee.

Prior to joining PSC, he was a vice president of AT&T Government Services, where he was responsible for managing key AT&T programs and opportunities. Earlier at AT&T, he was the vice president responsible for the government contracts, pricing, compliance, and proposal development organizations. From 1986 to 1995, he was corporate director of government relations and senior counsel at Sundstrand Corporation.

Chvotkin is a member of the Supreme Court, American, and District of Columbia Bar Associations. He is also a member of the National Contract Management Association and serves on its national board of advisors and as a fellow of the organization. Chvotkin is also a two-time "Fed 100" winner. He has a law degree from The American University's Washington College of Law, a master's degree in public administration and a bachelor's degree in political science.



# Services Supply Chain in the Department of Defense: Drivers of Acquisition Management Practices in the Army

**Rene Rendon**—Rendon is an associate professor at the Naval Postgraduate School (NPS), where he teaches defense acquisition courses. Prior to his appointment at the NPS, he served for more than 22 years as an acquisition and contracting officer in the United States Air Force, retiring at the rank of lieutenant colonel. His Air Force career included assignments as a contracting officer for the Peacekeeper ICBM, Maverick Missile, and the F-22 Raptor. He was also the director of contracting for the Air Force's Space-Based Infrared satellite program and the Evolved Expendable Launch Vehicle rocket program.

**Uday M. Apte**—Apte is a professor of operations management at the Graduate School of Business and Public Policy at the Naval Postgraduate School (NPS) in Monterey, CA. Before joining the NPS, Apte taught at The Wharton School, University of Pennsylvania, Philadelphia, PA, and at the Cox School of Business, Southern Methodist University, Dallas, TX. Apte holds a PhD in decision sciences from The Wharton School, University of Pennsylvania. Prior to his career in academia, Apte worked for over 10 years in managing operations and information systems in the financial services and utility industries.

**Aruna Apte**—Apte is an assistant professor in the Operations and Logistics Management Department of the Graduate School of Business and Public Policy at the Naval Postgraduate School in Monterey, CA. Her research interests are in the areas of developing mathematical models and algorithms for complex, real-world operational problems using techniques of optimization. [auapte@nps.edu]

## Abstract

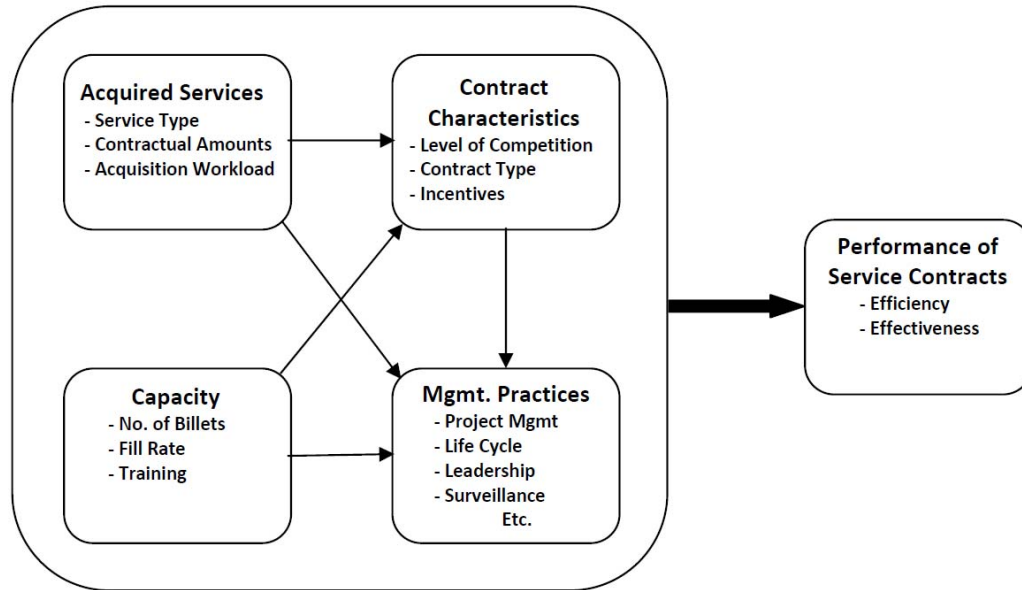
In this research, we reviewed contract files and interviewed subject-matter experts to collect and analyze data regarding the Army's contract and management practices in the acquisition of services. We examined 154 contracts for four specific service types at eight U.S. Army Mission and Installation Contracting Command (MICC) organizations. The goal was to answer three research questions: (1) Do the contract characteristics differ for different types of services? (2) Do the types of services being acquired affect the management practices being used? (3) Does the capacity for carrying out acquisition-related work affect the management practices being used? The evaluation of the six contract characteristics revealed that a relationship does exist between service type and three of the contract characteristics—contract cost, number of modifications, and contract award strategies. The evaluation of the 13 management practices showed that there exists a relationship between service type and five of the management practices: the use of independent government estimates (IGE), the number of personnel assigned to a contract, the officer serving as the acquisition lead, the use of a quality assurance surveillance plan (QASP), and the use of an IGE for contracts valued over the simplified acquisition threshold. Our research findings also suggested that a relationship does exist between capacity and management practices and that further research is needed to confirm this relationship. Based on the findings of our research, we make several specific recommendations to the U.S. Army MICC for improving the efficiency and effectiveness in the acquisition of these four specific service types.

## Introduction

As shown in Figure 1, contract characteristics are affected by the type of service being acquired, while the management practices being used are influenced by the services being acquired, the contract characteristics, and, more importantly, the capacity available to perform the acquisition work. As indicated in Figure 1, the primary question driving our research is “what drives the performance of services contracts?” Our approach in answering this primary question is to break down the overall services acquisition system into smaller parts, gain understanding of the functioning of each part, and then put all the pieces together to better understand the overall system and answer the primary question. Hence,



this research project focuses mainly on understanding the drivers of management practices (i.e., the factors that promote or obstruct the use of best practices in acquisition management), which in itself is a worthy and non-trivial goal. The results of this research will then be highly useful in our follow-on research, wherein we will return to answering the primary question of “what drives the performance of services contracts?”



**Figure 1. Drivers of Acquisition Practices and Performance**

The objective of this research project is to build on the understanding developed in prior research projects by undertaking a focused, in-depth study of services acquisition in the Army so as to understand the drivers of acquisition management practices (i.e., the factors that promote or obstruct the use of best practices in acquisition management). Hence, this research focuses on answering three specific research questions:

- Do the contract characteristics differ for different types of services?
- Do the types of services being acquired affect the management practices being used?
- Does the capacity for carrying out acquisition-related work affect the management practices being used?

Our research methodology included conducting contract file reviews to capture specific contract data and conducting interviews with subject-matter experts to gather information on management practices. The contract file reviews were documented using a data collection form that was specifically developed for this research and that was pilot tested and used in earlier empirical studies (McFall & La, 2011; Ramos & Nabors, 2011). The contract file reviews and subject-matter expert interviews were conducted in 2011 at eight U.S. Army Mission and Installation Contracting Command (MICC) contracting organizations. A total of 154 contracts were reviewed at these eight organizations. The research was focused on the following four product service codes (PSCs):

- R (Professional, Administrative, and Management Support Services)
- J (Maintenance, Repair, and Rebuilding of Equipment Services)
- S (Utilities and Housekeeping Services)



- D (Automatic Data Processing and Telecommunications Services)

These service types are common throughout the Department of Defense (DoD) and the U.S. Army, and they accounted for over 60% of Army services procurement dollars in fiscal year (FY) 2009 (McFall & La, 2011).

The contract file reviews and subject-matter expert interviews were focused on the following contract characteristics and management practices:

- *Contract Characteristics*: level of competition; contract type; award/incentive fee; contract cost; number of modifications; and award basis.
- *Management Practices*: use of independent government estimate (IGE); number of personnel assigned; use of a team approach; acquisition leadership; contract award time; acquisition plan; PWS/SOW; price analysis; price negotiation memorandum; quality assurance plan; and closeout letter.

In answering the research questions, we used descriptive and inferential statistics to analyze the data on service type, contract characteristics, and management practices. We explored the relationship between service type and contract characteristics and between service type and management practices using the chi-square test of independence. We tested our null hypothesis that there is no significant statistical dependence between service type and contract characteristics or between service type and management practices.

### **The Empirical Study: Data, Analysis, and Results**

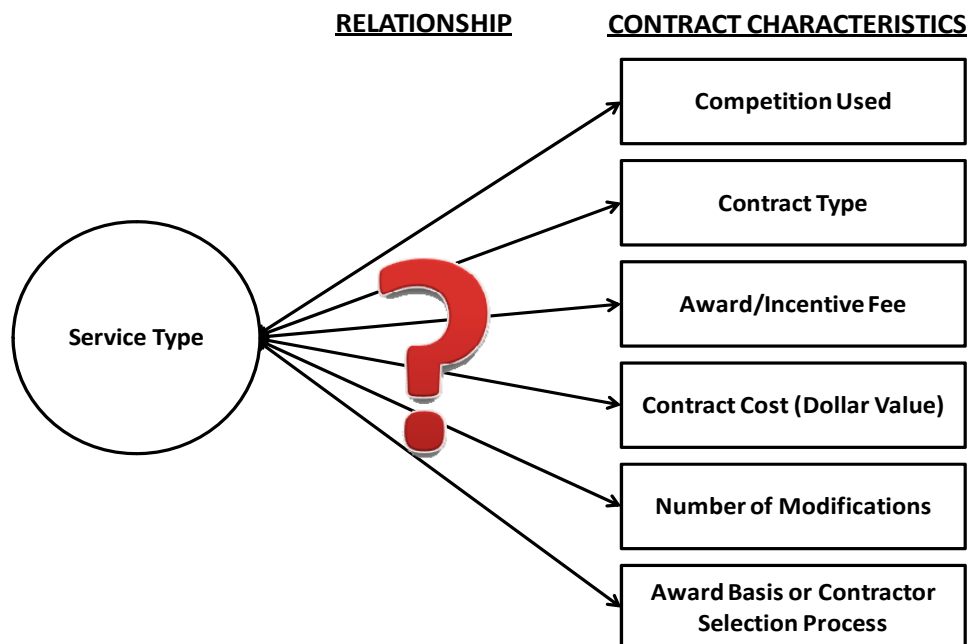
In this section, we present the results of our survey and its analysis. As discussed earlier, the survey was conducted at eight MICC offices to collect data on four service types for 154 contracts. This data was analyzed to answer the three research questions identified earlier.

We used the statistical technique of chi-square hypothesis testing to answer the first two research questions (i.e., to determine whether or not there exists a relationship between the service type and specific contract characteristics and between the service type and specific management practices). We present the data and discuss our analysis and results in the following three subsections to answer the three research questions, respectively.

#### ***Service Type and Contract Characteristics***

The focus of our first research question was to determine whether a relationship exists between service type and contract characteristics. As illustrated in Figure 2, we collected and analyzed each service type's relationship with six specific contract characteristics: (1) level of competition used, (2) contract type, (3) award/incentive fee, (4) contract cost in dollar value, (5) number of modifications, and (6) award basis. The results of the chi-square test are presented in Table 1, while a summary of the survey data is presented in Table 2. After presenting these results, we discuss the details of the relationship between service type and each contract characteristic.





**Figure 2. Relationship Between Service Type and Contract Characteristics**

**Table 1. Results of Chi-Square Test Between Service Type and Contract Characteristics**

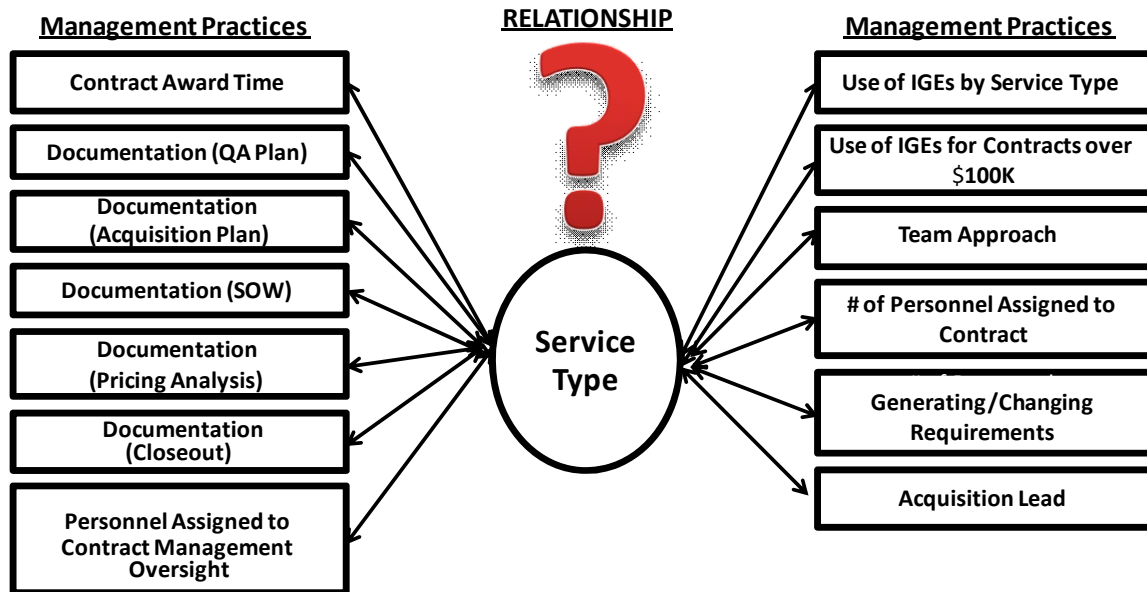
| Factor 1     | Factor 2                                    | <i>p</i> value | Significance   | Reject Null Hypothesis? |
|--------------|---------------------------------------------|----------------|----------------|-------------------------|
| Service Type | Level of Competition Used                   | 0.8958         | > 0.05         | No                      |
| Service Type | Contract Type                               | Not Applicable | Not Applicable | No                      |
| Service Type | Award/Incentive Fee                         | Not Applicable | Not Applicable | No                      |
| Service Type | Contract Cost (Dollar Value)                | 0.0022         | < 0.05         | Yes                     |
| Service Type | Number of Modifications                     | 0.0442         | < 0.05         | Yes                     |
| Service Type | Award Basis or Contractor Selection Process | 0.0268         | < 0.05         | Yes                     |

**Table 2. Survey Data on Service Type and Contract Characteristics**

| Contract Characteristic                     | Service Type |    |     |     | Total |
|---------------------------------------------|--------------|----|-----|-----|-------|
|                                             | D            | J  | R   | S   |       |
| Level of Competition                        |              |    |     |     |       |
| Full/Open Competition                       | 18           | 18 | 27  | 23  | 86    |
| Sole Source                                 | 16           | 11 | 22  | 19  | 68    |
| Total                                       | 34           | 29 | 49  | 42  | 154   |
| Sole Source Justification                   |              |    |     |     |       |
| Only Provider                               | 5            | 3  | 17  | 1   | 26    |
| Unusual/Compelling Urgency                  | 3            | 3  | 1   | 4   | 11    |
| Set Aside                                   | 8            | 4  | 4   | 3   | 19    |
| Ability One                                 |              | 1  |     | 5   | 6     |
| Utilities                                   |              |    |     | 6   | 6     |
| Subtotal Sole Source                        | 16           | 11 | 22  | 19  | 68    |
| Contract Type                               |              |    |     |     |       |
| Firm-Fixed Price                            | 34           | 29 | 49  | 42  | 154   |
| Cost Reimbursable                           | 0            | 0  | 0   | 0   | 0     |
| Total                                       | 34           | 29 | 49  | 42  | 154   |
| Award/Incentive Fee                         |              |    |     |     |       |
| Yes                                         | 0            | 0  | 0   | 1   | 1     |
| No                                          | 34           | 29 | 49  | 41  | 153   |
| Total                                       | 34           | 29 | 49  | 42  | 154   |
| Contract Cost (\$)                          |              |    |     |     |       |
| Cost > \$100K                               | 12           | 6  | 23  | 27  | 68    |
| Cost ≤ \$100K                               | 22           | 23 | 26  | 15  | 86    |
| Total                                       | 34           | 29 | 49  | 42  | 154   |
| Type of Modifications                       |              |    |     |     |       |
| Option                                      | 16           | 20 | 30  | 27  | 93    |
| Funding                                     | 21           | 40 | 113 | 108 | 282   |
| Admin                                       | 19           | 21 | 70  | 39  | 149   |
| Termination                                 | 0            | 0  | 1   | 0   | 1     |
| Novation                                    | 1            | 0  | 2   | 0   | 3     |
| Supplemental                                | 0            | 0  | 2   | 0   | 2     |
| Total                                       | 57           | 81 | 218 | 174 | 530   |
| Award Basis or Contractor Selection Process |              |    |     |     |       |
| LPTA                                        | 17           | 16 | 18  | 18  | 69    |
| Direct Award                                | 8            | 4  | 13  | 7   | 32    |
| Ability One                                 | 0            | 1  | 0   | 7   | 8     |
| Best Value                                  | 1            | 2  | 9   | 4   | 16    |
| Urgent/Compelling                           | 2            | 2  | 3   | 4   | 11    |
| Only Provider                               | 6            | 4  | 6   | 2   | 18    |
| Total                                       | 34           | 29 | 49  | 42  | 154   |

### ***Service Type and Management Practices***

For our second research question, we investigated whether a relationship exists between service type and management practices. As illustrated in Figure 3, we considered 13 management practices.



**Figure 3. Assessment of Relationship Between Service Type and Management Practices**

The majority of the management practices we evaluated showed no evidence of a relationship between the two factors. Specifically, the chi-square test results suggested that a relationship exists between service type and the following management practices: the use of IGEs, the use of IGEs provided for contracts based on contract value, the number of personnel assigned to a contract, the contracting lead for the requirement, and the use of a quality assurance surveillance plan (QASP). A summary of the survey data about the relationship between service type and management practices is given in Table 3, and a summary of the chi-square test results about the relationship are presented in Table 4.

**Table 3. Chi-Square Hypothesis Testing Results Between Service Type and Management Practices**

| Factor 1     | Factor 2                                                   | <i>p</i> value | Significance | Reject Null Hypothesis? |
|--------------|------------------------------------------------------------|----------------|--------------|-------------------------|
| Service Type | Use of IGEs by Service Type                                | 0.0068         | < 0.05       | Yes                     |
| IGE          | Use of IGEs for Contracts over \$100K                      | 0.0002         | < 0.05       | Yes                     |
| Service Type | No. of Personnel Assigned to Contract                      | 0.0449         | < 0.05       | Yes                     |
| Service Type | No. of Personnel Generating/Changing Requirements          | 0.0822         | > 0.05       | No                      |
| Service Type | No. of Personnel Assigned to Contract Management Oversight | 0.1695         | > 0.05       | No                      |
| Service Type | Team Approach                                              | 0.3142         | > 0.05       | No                      |
| Service Type | Acquisition Lead                                           | 0.0076         | < 0.05       | Yes                     |
| Service Type | Contract Award Time                                        | 0.1127         | > 0.05       | No                      |
| Service Type | Documentation (Acquisition Plan)                           | 0.5665         | > 0.05       | No                      |
| Service Type | Documentation (PWS/SOW)                                    | 0.6909         | > 0.05       | No                      |
| Service Type | Documentation (Pricing Analysis)                           | 0.5391         | > 0.05       | No                      |
| Service Type | Documentation (PNM)                                        | 0.0871         | > 0.05       | No                      |
| Service Type | Documentation (QASP Plan)                                  | 0.0115         | < 0.05       | Yes                     |
| Service Type | Documentation (Closeout Letter)                            | 0.4676         | > 0.05       | No                      |



**Table 4. Survey Data on Service Type and Management Practices**

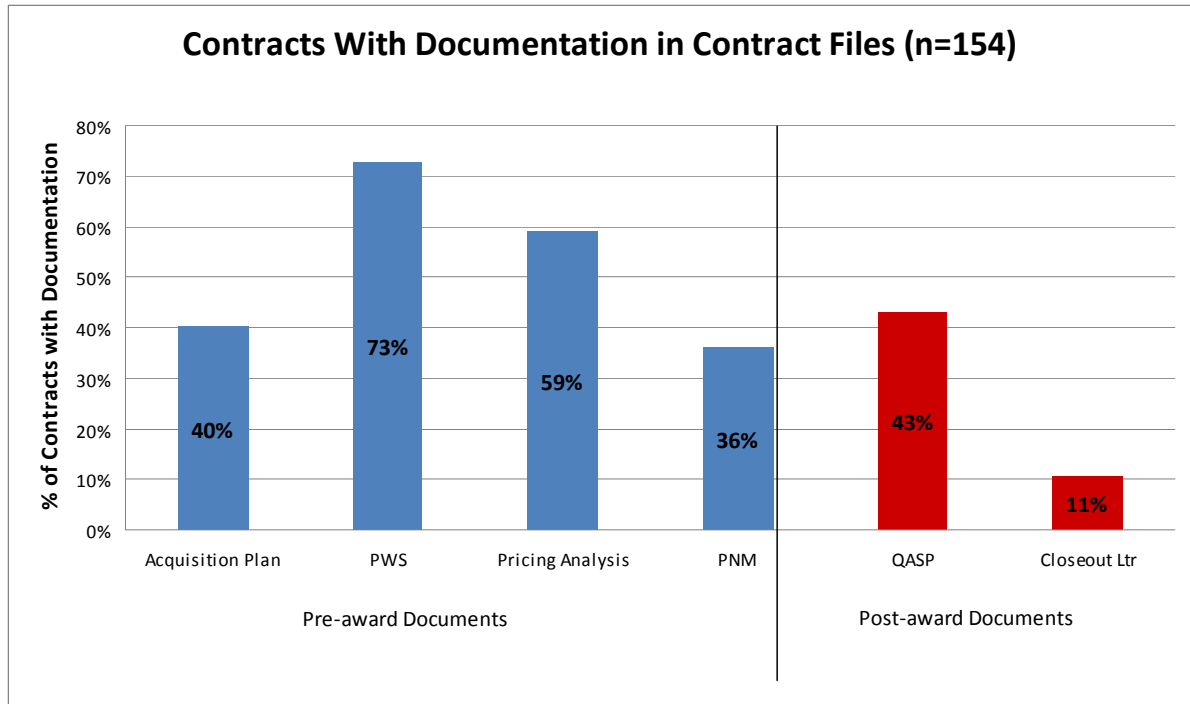
| Management Practice                               | Service Type |    |    |    | Total |
|---------------------------------------------------|--------------|----|----|----|-------|
|                                                   | D            | J  | R  | S  |       |
| Use of IGEs by Service Type                       |              |    |    |    |       |
| No                                                | 27           | 16 | 20 | 23 | 86    |
| Yes                                               | 7            | 13 | 29 | 19 | 68    |
| Total                                             | 34           | 29 | 49 | 42 | 154   |
| Team Approach                                     |              |    |    |    |       |
| No                                                | 18           | 10 | 19 | 14 | 61    |
| Yes                                               | 16           | 19 | 30 | 28 | 93    |
| Total                                             | 34           | 29 | 49 | 42 | 154   |
| No. of Personnel Assigned to Contract             |              |    |    |    |       |
| 1                                                 | 2            | 2  | 0  | 0  | 4     |
| 2                                                 | 10           | 2  | 9  | 13 | 34    |
| 3                                                 | 14           | 20 | 25 | 14 | 73    |
| 4                                                 | 2            |    | 8  | 4  | 14    |
| 5                                                 | 6            | 5  | 5  | 9  | 25    |
| 6                                                 | 0            | 0  | 1  | 0  | 1     |
| 8                                                 | 0            | 0  | 1  | 2  | 3     |
| Total                                             | 34           | 29 | 49 | 42 | 154   |
| Acquisition Lead                                  |              |    |    |    |       |
| Contract Specialist                               | 2            | 5  | 0  | 1  | 8     |
| Contract Lead                                     | 32           | 24 | 49 | 41 | 146   |
| Total                                             | 34           | 29 | 49 | 42 | 154   |
| No. of Personnel Generating/Changing Requirements |              |    |    |    |       |
| 1                                                 | 7            | 6  | 4  | 3  | 20    |
| 2                                                 | 26           | 16 | 40 | 32 | 114   |
| 3                                                 | 1            | 7  | 5  | 6  | 19    |
| 8                                                 | 0            | 0  | 0  | 1  | 1     |
| Total                                             | 34           | 29 | 49 | 42 | 154   |
| No. of Personnel Assigned to Contractor Oversight |              |    |    |    |       |
| 1                                                 | 3            | 4  | 0  | 1  | 8     |
| 2                                                 | 15           | 7  | 17 | 17 | 56    |
| 3                                                 | 15           | 15 | 24 | 19 | 73    |
| 4                                                 | 1            | 3  | 8  | 2  | 14    |
| 5                                                 | 0            | 0  | 0  | 1  | 1     |
| 6                                                 | 0            | 0  | 0  | 1  | 1     |
| 8                                                 | 0            | 0  | 0  | 1  | 1     |
| Total                                             | 34           | 29 | 49 | 42 | 154   |
| Contract Award Time (meets PALT?)                 |              |    |    |    |       |
| No                                                | 11           | 15 | 26 | 25 | 77    |
| Yes                                               | 23           | 14 | 23 | 17 | 77    |
| Total                                             | 34           | 29 | 49 | 42 | 154   |

| Management Practice                     | Service Type |    |    |    | Total |
|-----------------------------------------|--------------|----|----|----|-------|
|                                         | D            | J  | R  | S  |       |
| Documentation (Acquisition Plan) Exists |              |    |    |    |       |
| No                                      | 20           | 20 | 30 | 22 | 92    |
| Yes                                     | 14           | 9  | 19 | 20 | 62    |
| Total                                   | 34           | 29 | 49 | 42 | 154   |
| Documentation (PW5) Exists              |              |    |    |    |       |
| No                                      |              |    |    |    |       |
| Yes                                     | 12           | 7  | 12 | 11 | 42    |
| Total                                   | 22           | 22 | 37 | 31 | 112   |
|                                         | 34           | 29 | 49 | 42 | 154   |
| Documentation (Pricing Analysis) Exists |              |    |    |    |       |
| No                                      | 16           | 13 | 16 | 18 | 63    |
| Yes                                     | 18           | 16 | 33 | 24 | 91    |
| Total                                   | 34           | 29 | 49 | 42 | 154   |
| Documentation (QA Plan) Exists          |              |    |    |    |       |
| No                                      | 27           | 18 | 22 | 21 | 88    |
| Yes                                     | 7            | 11 | 27 | 21 | 66    |
| Total                                   | 34           | 29 | 49 | 42 | 154   |
| Documentation (Closeout Letter) Exists  |              |    |    |    |       |
| No                                      | 15           | 16 | 20 | 17 | 68    |
| Yes                                     | 3            | 2  | 1  | 1  | 7     |
| N/A                                     | 16           | 11 | 28 | 24 | 79    |
| Total                                   | 34           | 29 | 49 | 42 | 154   |
| Documentation (PNM) Exists              |              |    |    |    |       |
| No                                      | 19           | 22 | 26 | 18 | 85    |
| Yes                                     | 8            | 4  | 18 | 14 | 44    |
| N/A                                     | 7            | 3  | 5  | 10 | 25    |
| Total                                   | 34           | 29 | 49 | 42 | 154   |

**Table 5. Chi-Square Hypothesis Testing Results Between the Use of IGE and Contract Cost**

| Management Practice             | Test<br><i>p</i> value | IGE Used? |     |       |
|---------------------------------|------------------------|-----------|-----|-------|
|                                 |                        | No        | Yes | Total |
| Use of IGEs and Contract's Cost | 0.0002                 |           |     |       |
| Under \$100K                    |                        | 62        | 29  | 91    |
| Over \$100K                     |                        | 24        | 39  | 63    |
| Total                           |                        | 86        | 68  | 154   |





**Figure 4. Percentage of Contract File Documents Found in Contract Files**

**Table 6. FY2010 Service Contracts Awarded**

|                                                                | MICC Office A | MICC Office C | MICC Office D | MICC Office E | MICC Office F      | MICC Office G | MICC Office H |
|----------------------------------------------------------------|---------------|---------------|---------------|---------------|--------------------|---------------|---------------|
| Total Dollar Value of Service Contracts Awarded (R, D, S, & J) | \$17,435,363  | \$38,361,394  | \$931,231,325 | \$316,000,000 | Data Not Available | \$293,000,000 | \$301,000,000 |
| Total Number of Service Contracts Awarded (R, D, S, & J)       | 76            | 766           | 542           | 226           |                    | 350           | 804           |
| Average Dollar Value per Service Contract                      | \$229,413     | \$50,080      | \$1,718,138   | \$1,398,230   |                    | \$838,000     | \$374,000     |

**Table 7. Office Capacity of MICC Offices Observed**

| Capacity Category | Capacity Subcategories | MICC Office A | MICC Office C | MICC Office D | MICC Office E | MICC Office F | MICC Office G | MICC Office H |
|-------------------|------------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| Billets           | Warranted              | 100%          | 88%           | 83%           | 58%           | 100%          | 100%          | 100%          |
|                   | Non-warranted          | 0%            | 84%           | 106%          | 47%           | 117%          | 86%           | 86%           |
| Certification     | DAWIA I                | 23%           | 13%           | 23%           | 8%            | 0%            | 2%            | 0%            |
|                   | DAWIA II               | 162%          | 24%           | 16%           | 54%           | 66%           | 66%           | 68%           |
|                   | DAWIA III              | 100%          | 27%           | 33%           | 118%          | 0%            | 32%           | 32%           |
| Experience        | < 1 year               | 18%           | 14%           | 7%            | 0%            | 14%           | 10%           | 4%            |
|                   | 1 - 2 years            | 18%           | 43%           | 12%           | 1%            | 23%           | 3%            | 2%            |
|                   | 2 - 3 years            | 10%           | 16%           | 7%            | 9%            | 34%           | 19%           | 21%           |
|                   | > 3 years              | 55%           | 17%           | 74%           | 90%           | 29%           | 68%           | 73%           |

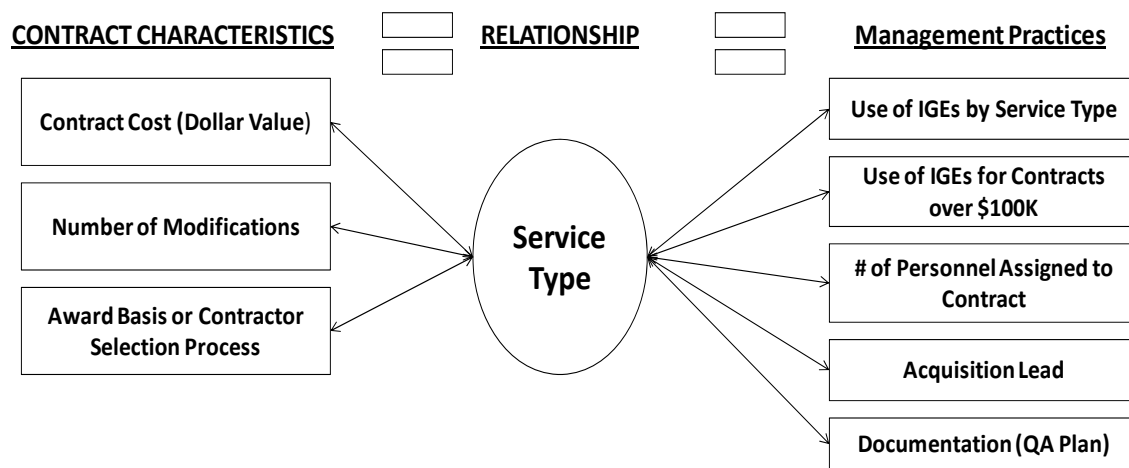


## Summary, Conclusion, and Recommendations

The purpose of this research was to understand the relationship between service types, contract characteristics, and management practices in order to understand the drivers of acquisition practice and performance. Our three research questions are restated here and summarily answered in the following subsections.

- Do the contract characteristics differ for different types of services?
- Do the types of services being acquired affect the management practices being used?
- Does the capacity for carrying out acquisition-related work affect the management practices being used?

Our research findings suggest a relationship between service type and three contract characteristics and between service type and five management practices, as shown in Figure 5.



**Figure 5. Summary of Findings From Data Analysis**

### ***Do the Contract Characteristics Differ for Different Types of Services?***

The evaluation of the six contract characteristics revealed a relationship between service type and three of the contract characteristics displayed in Figure 5. Specifically, we found the following results:

- The average annual contract cost for service type S was significantly higher than for the other three service types we evaluated.
- The number of modifications applied to service types R and S were considerably larger than for service types D and J.
- Service types D and J used LPTA contract award strategies approximately 50% of the time, while service types R and S awarded contracts more frequently based on a best value trade-off.

We also observed that every contract was awarded as FFP, only one contract utilized an incentive or award fee, and the use of competition in the solicitation process was not related to service type.



### ***Do the Types of Services Being Acquired Affect the Management Practices Being Used?***

The evaluation of the 14 management practices revealed a relationship between service type and five of the management practices, as shown in Figure 5. The findings indicated a relationship between service type and the following management practices:

- In the use of IGEs in contracts for the specific services, we found that over half of the contracts for all service types did not have an IGE. In addition, for the use of an IGE for contracts over the simplified acquisition threshold, only 32% of the contracts did have an IGE.
- The average number of personnel assigned to a contract does have a relationship with service type; specifically, the average number of personnel was high for service types R and S.
- We clearly identified the contracting officer as the acquisition lead for 146 of the 154 contracts we evaluated and the contract specialist as the acquisition lead for the remaining eight contracts.
- The QASP was the only acquisition document that had a relationship with service type. Only 43% of the contracts we evaluated had a QASP in the contract file.

Based on our research findings, it appears that factors other than service type may share a stronger relationship with the management practices, and this indicates a need to further research the topic.

### ***Does the Capacity for Carrying Out Acquisition-Related Work Affect the Management Practices Being Used?***

Our research findings suggested that a relationship exists between capacity and management practices. Our findings revealed that offices lacked the requisite number of authorized personnel to perform acquisition functions and a majority of the personnel on hand lacked proper training certifications. On average, these offices handled a significant number of service contracts, and, not factoring in other procurement requirements, the MICC acquisition workforce is managing substantial workloads with minimal personnel.

Our research findings also indicated that although standard practices for managing service contracts were common at all of the MICC offices, most offices did not incorporate a standard contract filing system. Based on contract file reviews, we found that most offices continue to maintain hard-copy contract files, while only one office maintained digital files. Regardless of storage method, contract file documentation was either incomplete or absent from files at all locations.

### **Recommendations**

Our research findings led us to identify several specific recommendations for the U.S. Army MICC for managing contracts for these four specific service types. We recommend that MICC contracting offices take the following actions:

1. Further scrutinize the use of sole-source contracts to ensure that competition requirements are being met and that fair and reasonable prices are being negotiated.
2. Evaluate the process of using IGEs as a tool for ensuring fair and reasonable prices.



3. Explore using contract options or award term incentives in the procurement of recurring services to help streamline the contracting process and reduce the time required to award contracts.
4. Explore the acquisition planning and requirements management processes to identify the cause for the higher level of contract modifications for R- and S-type services. This factor results in an increased burden on the contracting workforce; hence, identifying and eliminating the cause will help lessen this unnecessary burden.
5. Consider using incentive and award fees in future services acquisition. Although using these fees may require additional administration effort on the part of the contracting office, the benefits resulting from higher contractor performance may outweigh the cost of administering the fees.
6. Insist on complete and accurate contract file documentation in the acquisition of services. Federal Acquisition Regulation (FAR) part 4 (2011) provides policy and regulations for contract file documentation that should be used to ensure that government records are maintained appropriately.
7. Adopt a project management approach to the acquisition of services. This approach includes establishing project teams consisting of cross-functional representatives involved in services acquisition. This approach also includes a dedicated project manager to lead the acquisition effort, as well as established roles and responsibilities for each of the project team members.
8. Agencies should focus on increasing the fill rate of acquisition billets within the organization. This will ensure that there are sufficient project managers, contracting officers/specialists, and contracting officer representatives (CORs) available to manage services acquisition.
9. In addition to having filled acquisition billets, emphasis should also be placed on ensuring that acquisition personnel are properly trained, educated, and experienced in their functional specialty areas, such as project management, contracting, and CORs. Agencies should track the acquisition workforce's attainment of the required Defense Acquisition Workforce Improvement Act (DAWIA) certification levels for each specialty area.
10. To maintain a competent and capable workforce, agencies should improve their effort in the recruitment, retention, and professional development of the acquisition workforce.

## References

- Apte, A., Apte, U., & Rendon, R. (2008). *Managing the services supply chain in the Department of Defense: An empirical study of current management practices* (Technical Report NPS-AM-08-137). Monterey, CA: Naval Postgraduate School.
- Apte, A., Apte, U., & Rendon, R. (2009). *Managing the services supply chain in the Department of Defense: Empirical study of the current management practices in the Army* (Technical Report NPS-AM-09-136). Monterey, CA: Naval Postgraduate School.
- Apte, A., Apte, U., & Rendon, R. (2010, Summer). Contracting for services in the U.S. Army: An empirical study of the current management practices. *Journal of Contract Management*, 9–21.
- Apte, U., Ferrer, G., Lewis, I., & Rendon, R. (2006). *Managing the service supply chain in the Department of Defense: Opportunities and challenges* (Technical Report NPS-AM-06-032). Monterey, CA: Naval Postgraduate School.



- Apte, U., & Rendon, R. (2007). *Managing the service supply chain in the Department of Defense: Implications for the program management infrastructure* (Technical Report NPS-PM-07-126). Monterey, CA: Naval Postgraduate School.
- Carter, A. B. (2010, June 28). *Better buying power: Mandate for restoring affordability and productivity in defense spending* [Memorandum]. Washington, DC: Office of the Under Secretary of Defense for Acquisition, Technology, and Logistics (USD[AT&L]).
- Department of the Army. (2010, July 30). *Research, development, and acquisition: Management and oversight of service acquisitions* (Army Regulation 70-13). Retrieved from [http://www.apd.army.mil/jw2/xmldemo/r70\\_13/head.asp](http://www.apd.army.mil/jw2/xmldemo/r70_13/head.asp)
- Department of Defense Office of Inspector General (DoD IG). (2009, April 22). *Summary of DoD Office of Inspector General Audits of Acquisition and Contract Administration* (DoD IG Report No. D-2009-071). Washington, DC: Author.
- Director, Defense Procurement and Acquisition Policy (DPAP). (2006, August 16). *Government Accountability Office high risk area of contract management* [Memorandum]. Washington, DC: OUSD(AT&L).
- Eisenhardt, K. M. (1989). Agency theory: An assessment and review. *Academy of Management Review*, 14(1), 57–74.
- Ellman, J., Liverood, R., Morrow, D., and Sanders, G. (2011). *Defense contract trends: U.S. Department of Defense contract spending and supporting industrial base*. Washington, DC: Center for Strategic & International Studies.
- Federal Acquisition Regulation (FAR), 48 C.F.R. ch. 1 (2011).
- Fitzsimmons, J. A., & Fitzsimmons, M. J. (2006). *Service management: Operations, strategy, and information technology* (5th ed.). New York, NY: McGraw-Hill.
- GAO. (2002a, January). *Best practices: Taking a strategic approach could improve DoD's acquisition of service* (GAO-02-230). Washington, DC: Author.
- GAO. (2002b, July). *Acquisition workforce: Agencies need to better define and track the training of their employees* (GAO-02-737). Washington, DC: Author.
- GAO. (2005, March). *Contract management: Opportunities to improve surveillance on Department of Defense service contracts* (GAO-05-274). Washington, DC: Author.
- GAO. (2007b, May). *Defense acquisitions: Improved management and oversight needed to better control DoD's acquisition of services* (GAO-07-832T). Washington, DC: Author.
- GAO. (2009a, January). *High-risk series: An update* (GAO-09-271). Washington, DC: Author.
- GAO. (2009b, March). *Department of Defense: Additional actions and data are needed to effectively manage and oversee DoD's acquisition workforce* (GAO-09-342). Washington, DC: Author.
- GAO. (2009c, April). *Defense acquisitions: Actions needed to ensure value for service contracts* (GAO-09-643T). Washington, DC: Author.
- GAO. (2011, September). *Defense acquisition: Better identification, development, and oversight needed for personnel in acquiring services* (GAO-11-892). Retrieved from <http://www.gao.gov/new.items/d11892.pdf>
- Gordon, G. L., Calantone, R. D., & Di Benedetto, A. (1993). Business-to-business service marketing: How does it differ from business-to-business product marketing? *Journal of Business and Industrial Marketing*, 8(1), 45–57.
- Lee, L., & Dobler, D. W. (1971). *Purchasing and materials management: Text and cases*. New York, NY: McGraw-Hill.
- Luo, Y. (2002). Contract, cooperation, and performance in international joint ventures. *Strategic Management Journal*, 23(10), 903–919.



- McFall, T. G., & La, D. (2011, June). *Mission and installation contracting command services acquisition: Empirical analysis of Army service contract management practices* (Master's thesis, Naval Postgraduate School). Retrieved from [http://edocs.nps.edu/npspubs/scholarly/MBAPR/2011/June/11Jun\\_McFall\\_MBA.pdf](http://edocs.nps.edu/npspubs/scholarly/MBAPR/2011/June/11Jun_McFall_MBA.pdf)
- Ramos, M., & Nabors, J. (2011, December). *Mission and installation contracting command services acquisition: Empirical analysis of Army service contract management practices* (Master's thesis, Naval Postgraduate School). Retrieved from [http://edocs.nps.edu/npspubs/scholarly/MBAPR/2011/December/11Dec\\_Ramos\\_MBA.pdf](http://edocs.nps.edu/npspubs/scholarly/MBAPR/2011/December/11Dec_Ramos_MBA.pdf)
- Rendon, R. G. (2011). MN4371: Acquisition and Contracting Policy [Course lecture notes], Naval Postgraduate School, Monterey, CA.
- Rendon, R. G., & Snider, K. F. (Eds.). (2008). *Management of defense acquisition projects*. Reston, VA: American Institute of Aeronautics and Astronautics.
- Schiele, J. J., & McCue, C. P. (2006). Professional service acquisition in public sector procurement. *International Journal of Operations and Production Management*, 26(3), 300–325.
- U.S. Army Contracting Command (ACC). (2010). *Contract operations: Interim Army Contracting Command—Contracting officers representative policy guide* (ACC 70-1). Retrieved from [http://www.acq.osd.mil/dpap/ccap/cc/corhb/Files/Training\\_Reference\\_Guidance/ACC%20Pamphlet%2070-1%20Final%20Sig%20032610.pdf](http://www.acq.osd.mil/dpap/ccap/cc/corhb/Files/Training_Reference_Guidance/ACC%20Pamphlet%2070-1%20Final%20Sig%20032610.pdf)
- Williamson, O. E. (1979). Transaction-cost economics: The governance of contractual relations. *Journal of Law and Economics*, 22(2), 233–261.





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# **Services Supply Chain in the Department of Defense: Drivers of Acquisition Management Practices in the Army**

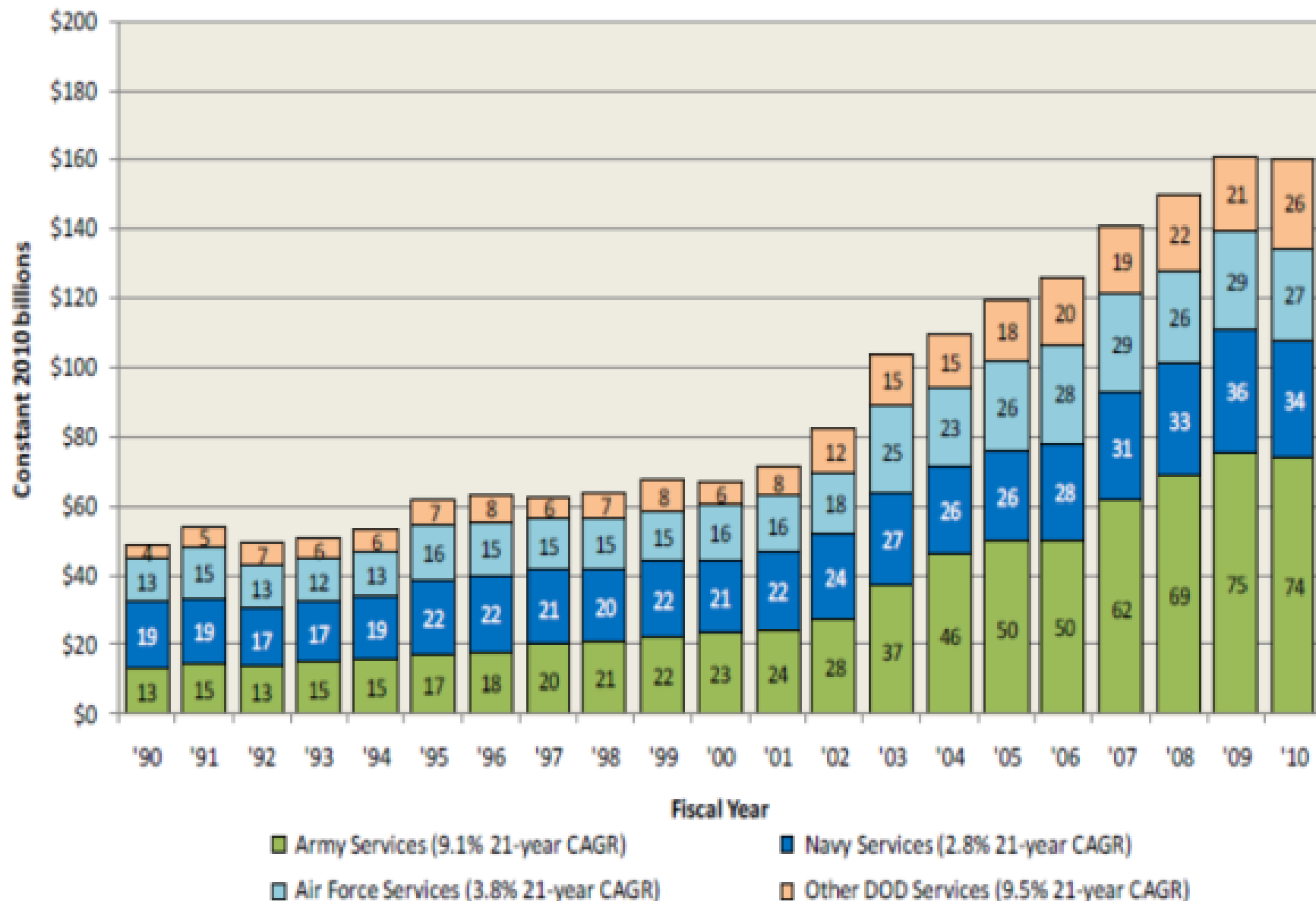
Aruna Apte, Uday Apte, and Rene Rendon

Naval Postgraduate School  
May 2012

# Overview

- Background
- The Empirical Study
- Analysis and Comparison of Data
- Conclusions
- Recommendations



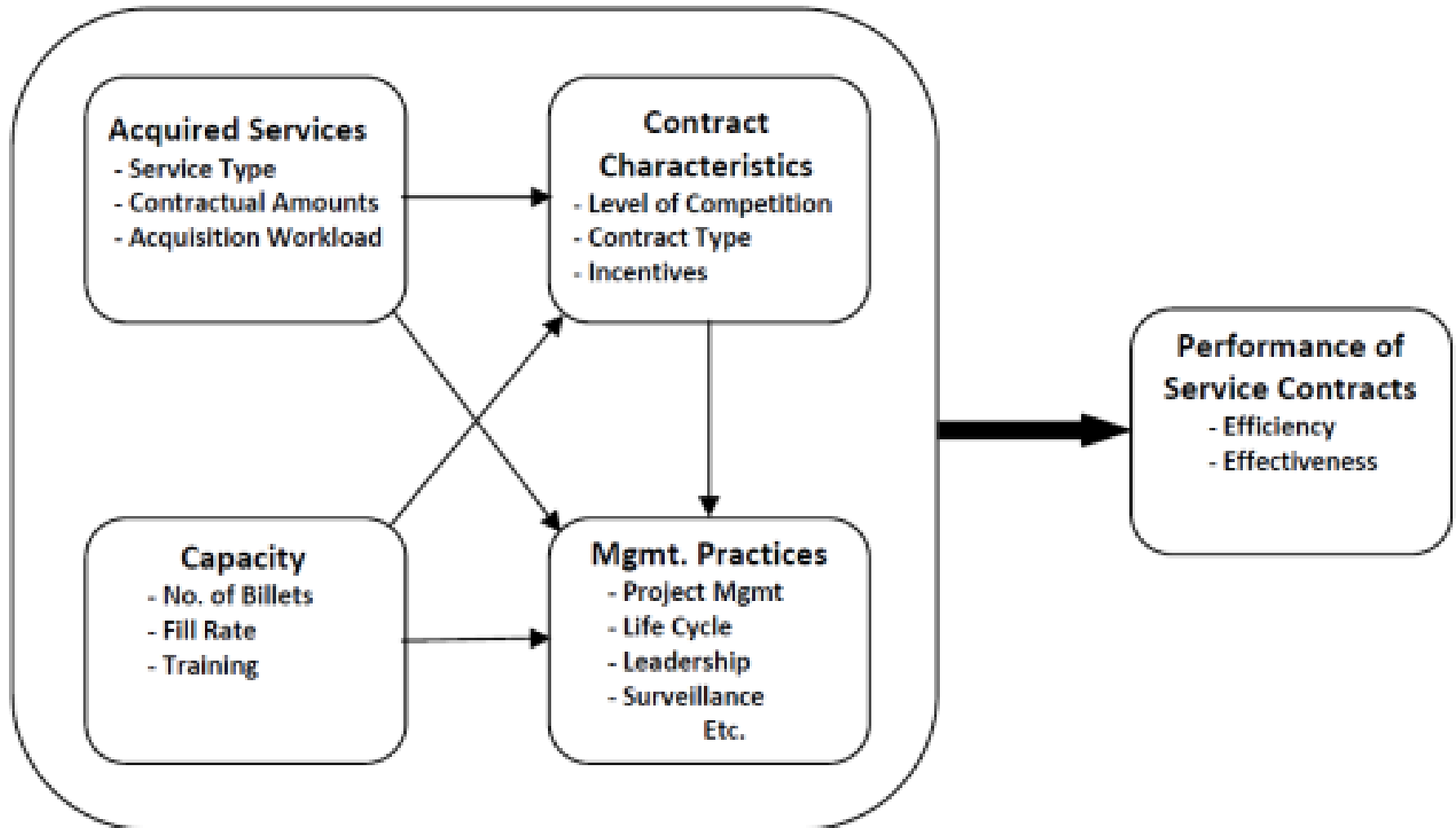


# Services Supply Chain the DoD Ongoing Research Program

- FY 2006** Exploratory Research: Opportunities and Challenges
- FY 2007** Implications for a Program Management Approach
- FY 2008** Empirical Study of Current Management Practices in the Air Force and Navy
- FY 2009** Empirical Study of Current Management Practices in the Army
- FY 2010** Comparison of Acquisition Management Practices in Army, Navy, and Air Force
- FY 2011** Drivers of Acquisition Management Practices in the Army



# Conceptual Framework



# Literature Survey: Theory and Practice

- Practice
  - 16 GAO Reports issued between 2001 to 2009
  - 142 DoD IG reports issued between 2002 to 2008
- Theory
  - Agency Theory and Principal-Agent Problem
  - Transaction Cost Economics
  - Service Operations Management
  - Contractual Theory: How contracts are planned, structured, awarded and administered



# The Empirical Study

- Do contract characteristics differ for different types of services?
- Do the types of services being acquired affect the management practices used?
- Does the capacity for carrying out acquisition-related work affect the management practices being used?



# The Empirical Study

- Review of contract file data
- Eight (8) U.S. Army MICC organizations
- 154 contracts
- Services studied include
  - Professional, Administrative, and Management Support (R)
  - Maintenance and Repair of Equipment (J)
  - Automated Data Processing and Telecommunications (D)
  - Utilities and Housekeeping (S)



# Contract Characteristics

- Level of Competition
- Contract Type
- Award/Incentive Fee
- Contract Cost;
- Number of Modifications
- Award Basis

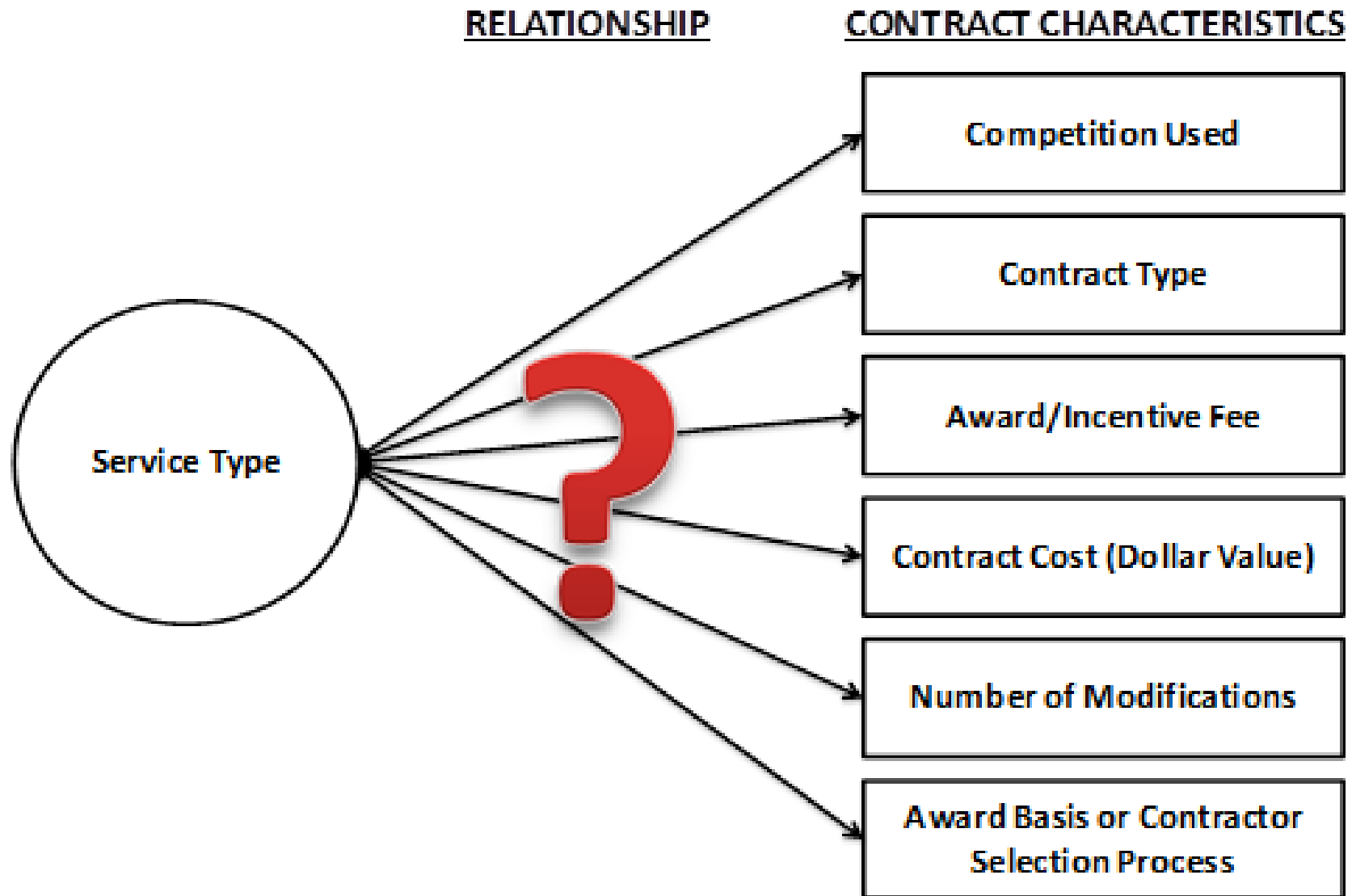


# Management Practices

- Use of Independent Government Estimate (IGE)
- Number of Personnel Assigned
- Use of a Team Approach
- Acquisition Leadership
- Contract Award Time; Acquisition Plan
- PWS/SOW
- Price Analysis
- Price Negotiation Memorandum
- Quality Assurance Plan
- Closeout Letter



# Relationship Between Service Type and Contract Characteristics



**Table 1. Results of Chi-Square Test Between Service Type and Contract Characteristics**

| <b>Factor 1</b> | <b>Factor 2</b>                             | <b><i>p</i> value</b> | <b>Significance</b> | <b>Reject Null Hypothesis?</b> |
|-----------------|---------------------------------------------|-----------------------|---------------------|--------------------------------|
| Service Type    | Level of Competition Used                   | 0.8958                | > 0.05              | No                             |
| Service Type    | Contract Type                               | Not Applicable        | Not Applicable      | No                             |
| Service Type    | Award/Incentive Fee                         | Not Applicable        | Not Applicable      | No                             |
| Service Type    | Contract Cost (Dollar Value)                | 0.0022                | < 0.05              | Yes                            |
| Service Type    | Number of Modifications                     | 0.0442                | < 0.05              | Yes                            |
| Service Type    | Award Basis or Contractor Selection Process | 0.0268                | < 0.05              | Yes                            |

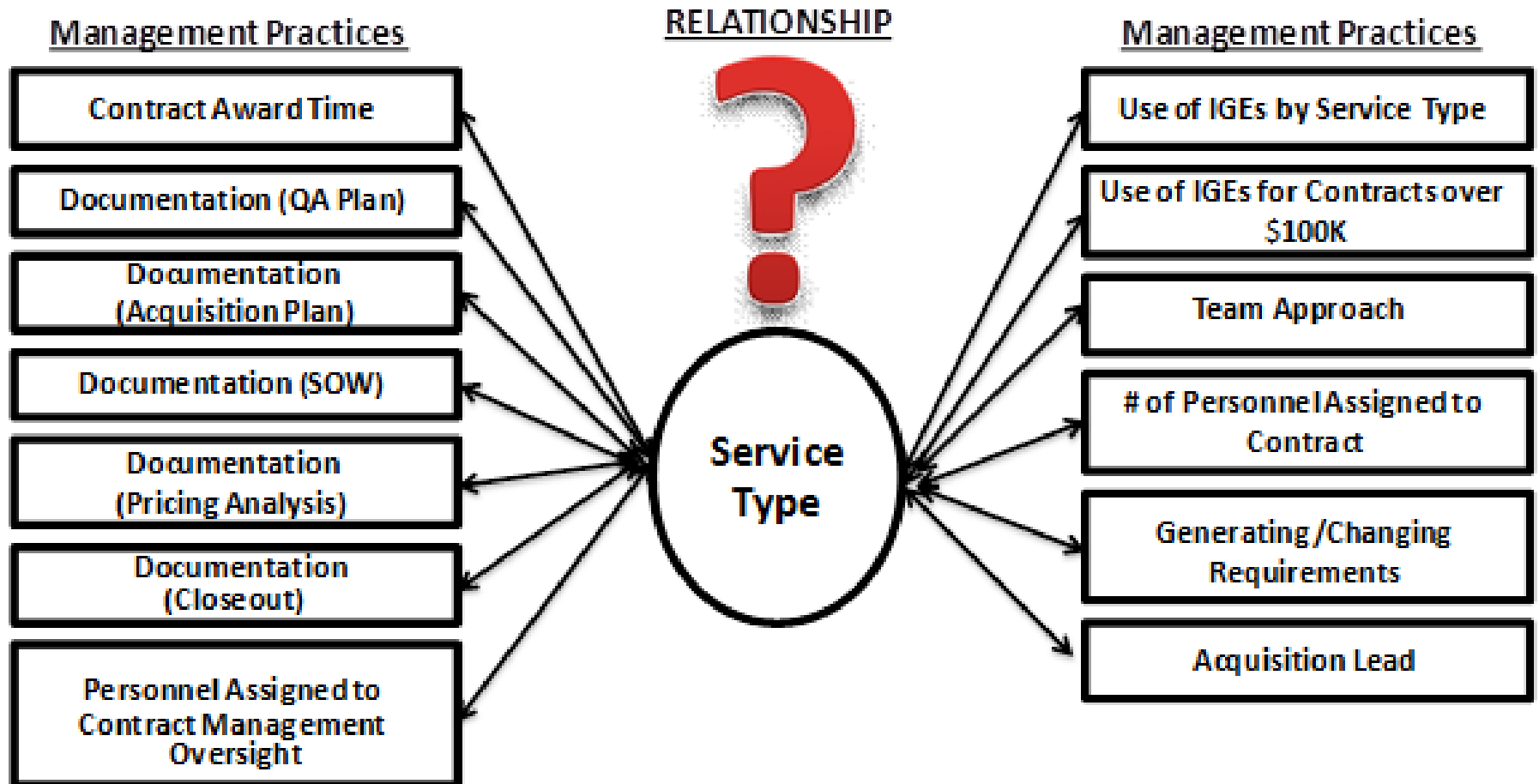
**Table 2: Survey Data on Service Type and Contract Characteristics**

| Contract Characteristic    | Service Type |    |    |    | Total |
|----------------------------|--------------|----|----|----|-------|
|                            | D            | J  | R  | S  |       |
| Level of Competition       |              |    |    |    |       |
| Full/Open Competition      | 18           | 18 | 27 | 23 | 86    |
| Sole Source                | 16           | 11 | 22 | 19 | 68    |
| Total                      | 34           | 29 | 49 | 42 | 154   |
| Sole Source Justification  |              |    |    |    |       |
| Only Provider              | 5            | 3  | 17 | 1  | 26    |
| Unusual/Compelling Urgency | 3            | 3  | 1  | 4  | 11    |
| Set Aside                  | 8            | 4  | 4  | 3  | 19    |
| Ability One                |              | 1  |    | 5  | 6     |
| Utilities                  |              |    |    | 6  | 6     |
| Subtotal Sole Source       | 16           | 11 | 22 | 19 | 68    |
| Contract Type              |              |    |    |    |       |
| Firm-Fixed Price           | 34           | 29 | 49 | 42 | 154   |
| Cost Reimbursable          | 0            | 0  | 0  | 0  | 0     |
| Total                      | 34           | 29 | 49 | 42 | 154   |
| Award/Incentive Fee        |              |    |    |    |       |
| Yes                        | 0            | 0  | 0  | 1  | 1     |
| No                         | 34           | 29 | 49 | 41 | 153   |
| Total                      | 34           | 29 | 49 | 42 | 154   |

**Table 2 Continued)**

| <b>Contract Characteristic</b>              | <b>Service Type</b> |          |          |          | <b>Total</b> |
|---------------------------------------------|---------------------|----------|----------|----------|--------------|
|                                             | <b>D</b>            | <b>J</b> | <b>R</b> | <b>S</b> |              |
| Contract Cost (\$)                          |                     |          |          |          |              |
| Cost > \$100K                               | 12                  | 6        | 23       | 27       | 68           |
| Cost ≤ \$100K                               | 22                  | 23       | 26       | 15       | 86           |
| Total                                       | 34                  | 29       | 49       | 42       | 154          |
| Type of Modifications                       |                     |          |          |          |              |
| Option                                      | 16                  | 20       | 30       | 27       | 93           |
| Funding                                     | 21                  | 40       | 113      | 108      | 282          |
| Admin                                       | 19                  | 21       | 70       | 39       | 149          |
| Termination                                 | 0                   | 0        | 1        | 0        | 1            |
| Novation                                    | 1                   | 0        | 2        | 0        | 3            |
| Supplemental                                | 0                   | 0        | 2        | 0        | 2            |
| Total                                       | 57                  | 81       | 218      | 174      | 530          |
| Award Basis or Contractor Selection Process |                     |          |          |          |              |
| LPTA                                        | 17                  | 16       | 18       | 18       | 69           |
| Direct Award                                | 8                   | 4        | 13       | 7        | 32           |
| Ability One                                 | 0                   | 1        | 0        | 7        | 8            |
| Best Value                                  | 1                   | 2        | 9        | 4        | 16           |
| Urgent/Compelling                           | 2                   | 2        | 3        | 4        | 11           |
| Only Provider                               | 6                   | 4        | 6        | 2        | 18           |
| Total                                       | 34                  | 29       | 49       | 42       | 154          |

# Relationship Between Service Type and Management Practices



**Table 3. Chi-Square Hypothesis Testing Results Between Service Type and Management Practices**

| Factor 1     | Factor 2                                                   | <i>p</i> value | Significance | Reject Null Hypothesis? |
|--------------|------------------------------------------------------------|----------------|--------------|-------------------------|
| Service Type | Use of IGEs by Service Type                                | 0.0068         | < 0.05       | Yes                     |
| IGE          | Use of IGEs for Contracts over \$100K                      | 0.0002         | < 0.05       | Yes                     |
| Service Type | No. of Personnel Assigned to Contract                      | 0.0449         | < 0.05       | Yes                     |
| Service Type | No. of Personnel Generating/Changing Requirements          | 0.0822         | > 0.05       | No                      |
| Service Type | No. of Personnel Assigned to Contract Management Oversight | 0.1695         | > 0.05       | No                      |
| Service Type | Team Approach                                              | 0.3142         | > 0.05       | No                      |
| Service Type | Acquisition Lead                                           | 0.0076         | < 0.05       | Yes                     |
| Service Type | Contract Award Time                                        | 0.1127         | > 0.05       | No                      |
| Service Type | Documentation (Acquisiton Plan)                            | 0.5665         | > 0.05       | No                      |
| Service Type | Documentation (PWS/SOW)                                    | 0.6909         | > 0.05       | No                      |
| Service Type | Documentation (Pricing Analysis)                           | 0.5391         | > 0.05       | No                      |
| Service Type | Documentation (PNM)                                        | 0.0871         | > 0.05       | No                      |
| Service Type | Documentation (QASP Plan)                                  | 0.0115         | < 0.05       | Yes                     |
| Service Type | Documentation (Closeout Letter)                            | 0.4676         | > 0.05       | No                      |

**Table 4: Survey Data on Service Type and Management Practices**

| Management Practice                   | Service Type |    |    |    | Total |
|---------------------------------------|--------------|----|----|----|-------|
|                                       | D            | J  | R  | S  |       |
| Use of IGEs by Service Type           |              |    |    |    |       |
| No                                    | 27           | 16 | 20 | 23 | 86    |
| Yes                                   | 7            | 13 | 29 | 19 | 68    |
| Total                                 | 34           | 29 | 49 | 42 | 154   |
| Team Approach                         |              |    |    |    |       |
| No                                    | 18           | 10 | 19 | 14 | 61    |
| Yes                                   | 16           | 19 | 30 | 28 | 93    |
| Total                                 | 34           | 29 | 49 | 42 | 154   |
| No. of Personnel Assigned to Contract |              |    |    |    |       |
| 1                                     | 2            | 2  | 0  | 0  | 4     |
| 2                                     | 10           | 2  | 9  | 13 | 34    |
| 3                                     | 14           | 20 | 25 | 14 | 73    |
| 4                                     | 2            |    | 8  | 4  | 14    |
| 5                                     | 6            | 5  | 5  | 9  | 25    |
| 6                                     | 0            | 0  | 1  | 0  | 1     |
| 8                                     | 0            | 0  | 1  | 2  | 3     |
| Total                                 | 34           | 29 | 49 | 42 | 154   |

### Table 4 (Continued)

| Management Practice                               | Service Type |    |    |    | Total |
|---------------------------------------------------|--------------|----|----|----|-------|
|                                                   | D            | J  | R  | S  |       |
| Acquisition Lead                                  |              |    |    |    |       |
| Contract Specialist                               | 2            | 5  | 0  | 1  | 8     |
| Contract Lead                                     | 32           | 24 | 49 | 41 | 146   |
| Total                                             | 34           | 29 | 49 | 42 | 154   |
| No. of Personnel Generating/Changing Requirements |              |    |    |    |       |
| 1                                                 | 7            | 6  | 4  | 3  | 20    |
| 2                                                 | 26           | 16 | 40 | 32 | 114   |
| 3                                                 | 1            | 7  | 5  | 6  | 19    |
| 8                                                 | 0            | 0  | 0  | 1  | 1     |
| Total                                             | 34           | 29 | 49 | 42 | 154   |
| No. of Personel Assigned to Contractor Oversight  |              |    |    |    |       |
| 1                                                 | 3            | 4  | 0  | 1  | 8     |
| 2                                                 | 15           | 7  | 17 | 17 | 56    |
| 3                                                 | 15           | 15 | 24 | 19 | 73    |
| 4                                                 | 1            | 3  | 8  | 2  | 14    |
| 5                                                 | 0            | 0  | 0  | 1  | 1     |
| 6                                                 | 0            | 0  | 0  | 1  | 1     |
| 8                                                 | 0            | 0  | 0  | 1  | 1     |
| Total                                             | 34           | 29 | 49 | 42 | 154   |
| Contract Award Time (meets PALT?)                 |              |    |    |    |       |
| No                                                | 11           | 15 | 26 | 25 | 77    |
| Yes                                               | 23           | 14 | 23 | 17 | 77    |
| Total                                             | 34           | 29 | 49 | 42 | 154   |

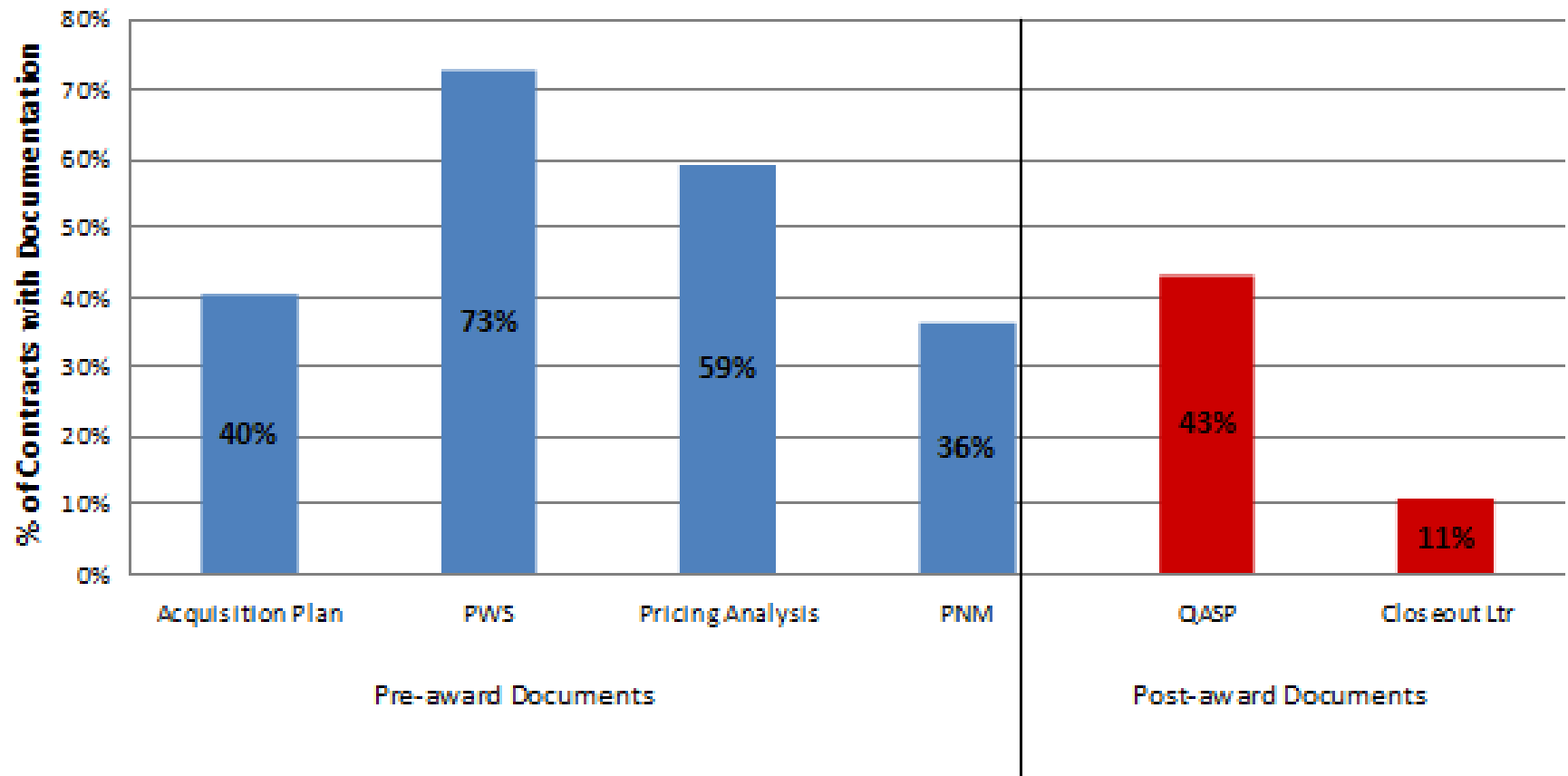
### Table 4 (Continued)

| Management Practice                     | Service Type |    |    |    | Total |
|-----------------------------------------|--------------|----|----|----|-------|
|                                         | D            | J  | R  | S  |       |
| Documentation (Acquisition Plan) Exists |              |    |    |    |       |
| No                                      | 20           | 20 | 30 | 22 | 92    |
| Yes                                     | 14           | 9  | 19 | 20 | 62    |
| Total                                   | 34           | 29 | 49 | 42 | 154   |
| Documentation (PW5) Exists              |              |    |    |    |       |
| No                                      |              |    |    |    |       |
| Yes                                     | 12           | 7  | 12 | 11 | 42    |
| Total                                   | 22           | 22 | 37 | 31 | 112   |
| Documentation (Pricing Analysis) Exists |              |    |    |    |       |
| No                                      | 16           | 13 | 16 | 18 | 63    |
| Yes                                     | 18           | 16 | 33 | 24 | 91    |
| Total                                   | 34           | 29 | 49 | 42 | 154   |
| Documentation (QA Plan) Exists          |              |    |    |    |       |
| No                                      | 27           | 18 | 22 | 21 | 88    |
| Yes                                     | 7            | 11 | 27 | 21 | 66    |
| Total                                   | 34           | 29 | 49 | 42 | 154   |
| Documentation (Closeout Letter) Exists  |              |    |    |    |       |
| No                                      | 15           | 16 | 20 | 17 | 68    |
| Yes                                     | 3            | 2  | 1  | 1  | 7     |
| N/A                                     | 16           | 11 | 28 | 24 | 79    |
| Total                                   | 34           | 29 | 49 | 42 | 154   |
| Documentation (PNM) Exists              |              |    |    |    |       |
| No                                      | 19           | 22 | 26 | 18 | 85    |
| Yes                                     | 8            | 4  | 18 | 14 | 44    |
| N/A                                     | 7            | 3  | 5  | 10 | 25    |
| Total                                   | 34           | 29 | 49 | 42 | 154   |

**Table 5. Chi-Square Hypothesis Testing Results Between Use of IGE and Contracts Cost**

| Management Practice             | Test<br><i>p</i> value | IGE Used? |     |       |
|---------------------------------|------------------------|-----------|-----|-------|
|                                 |                        | No        | Yes | Total |
| Use of IGEs and Contract's Cost | 0.0002                 |           |     |       |
| Under \$100K                    |                        | 62        | 29  | 91    |
| Over \$100K                     |                        | 24        | 39  | 63    |
| Total                           |                        | 86        | 68  | 154   |

## Contracts With Documentation in Contract Files (n=154)



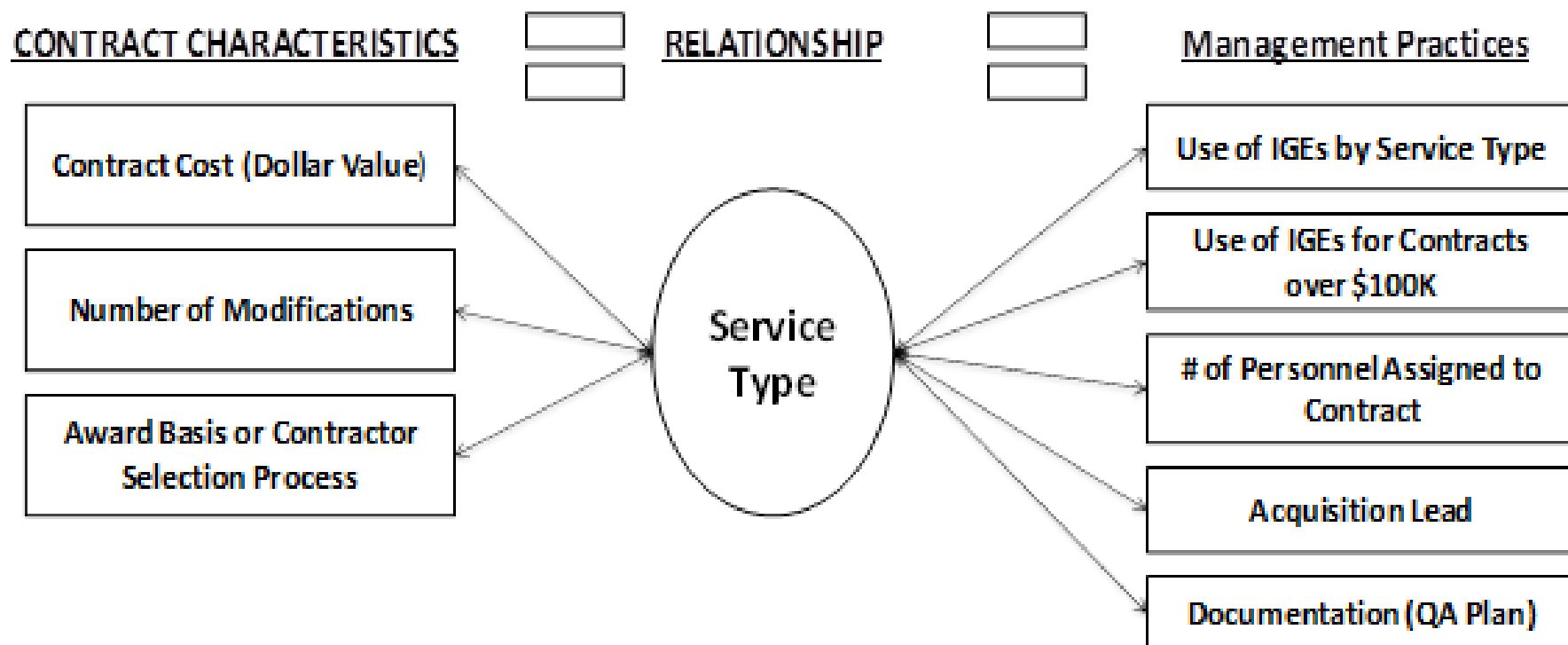
**Table 6. FY2010 Service Contracts Awarded**

|                                                                                   | MICC<br>Office A | MICC<br>Office C | MICC<br>Office D | MICC<br>Office E | MICC<br>Office F      | MICC<br>Office G | MIC<br>Office |
|-----------------------------------------------------------------------------------|------------------|------------------|------------------|------------------|-----------------------|------------------|---------------|
| <b>Total Dollar Value of<br/>Service Contracts<br/>Awarded (R, D, S, &amp; J)</b> | \$17,435,363     | \$38,361,394     | \$931,231,325    | \$316,000,000    | Data Not<br>Available | \$293,000,000    | \$301,000     |
| <b>Total Number of<br/>Service Contracts<br/>Awarded (R, D, S, &amp; J)</b>       | 76               | 766              | 542              | 226              |                       | 350              | 804           |
| <b>Average Dollar Value<br/>per Service Contract</b>                              | \$229,413        | \$50,080         | \$1,718,138      | \$1,398,230      |                       | \$838,000        | \$374,0       |

**Table 7. Office Capacity of MICC Offices Observed**

| Capacity Category | Capacity Subcategories | MICC Office A | MICC Office C | MICC Office D | MICC Office E | MICC Office F | MICC Office G | MICC Office H |
|-------------------|------------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| Billets           | Warranted              | 100%          | 88%           | 83%           | 58%           | 100%          | 100%          | 100%          |
|                   | Non-warranted          | 0%            | 84%           | 106%          | 47%           | 117%          | 86%           | 86%           |
| Certification     | DAWIA I                | 23%           | 13%           | 23%           | 8%            | 0%            | 2%            | 0%            |
|                   | DAWIA II               | 162%          | 24%           | 16%           | 54%           | 66%           | 66%           | 68%           |
|                   | DAWIA III              | 100%          | 27%           | 33%           | 118%          | 0%            | 32%           | 32%           |
| Experience        | < 1 year               | 18%           | 14%           | 7%            | 0%            | 14%           | 10%           | 4%            |
|                   | 1 - 2 years            | 18%           | 43%           | 12%           | 1%            | 23%           | 3%            | 2%            |
|                   | 2 - 3 years            | 10%           | 16%           | 7%            | 9%            | 34%           | 19%           | 21%           |
|                   | > 3 years              | 55%           | 17%           | 74%           | 90%           | 29%           | 68%           | 73%           |

# Summary of Findings From Data Analysis



# Conclusions

- **Do the Contract Characteristics Differ for Different Types of Services?**
  - The average annual contract cost for service type S was significantly higher than for the other three service types evaluated.
  - The number of modifications applied to service types R and S were considerably larger than for service types D and J.
  - Service types D and J used LPTA contract award strategies approximately 50% of the time, while service types R and S awarded contracts more frequently based on a best value trade-off.
  - We also observed that every contract was awarded as FFP, only one contract utilized an incentive or award fee, and the use of competition in the solicitation process was not related to service type.



# Conclusions

- **Do the Types of Services Being Acquired Affect the Management Practices Being Used?**
  - In the use of IGEs in contracts for the specific services, we found that over half of the contracts for all service types did not have an IGE. In addition, for the use of an IGE for contracts over the simplified acquisition threshold, only 32% of the contracts did have an IGE.
  - The average number of personnel assigned to a contract does have a relationship with service type; specifically, the average number of personnel was high for service types R and S.



# Conclusions

- **Do the Types of Services Being Acquired Affect the Management Practices Being Used?**
  - We clearly identified the contracting officer as the acquisition lead for 146 of the 154 contracts we evaluated and the contract specialist as the acquisition lead for the remaining eight contracts.
  - The quality assurance surveillance plan (QASP) was the only acquisition document that had a relationship with service type. Only 43% of contracts we evaluated had a QASP in the contract file.



# Conclusions

- **Does the Capacity for Carrying out Acquisition-Related Work Affect the Management Practices Being Used?**
  - Relationship exists between capacity and management practices.
  - Offices lacked the requisite number of authorized personnel to perform acquisition functions, and a majority of the personnel on hand lacked proper training certifications.
  - Although standard practices for managing service contracts were common at all the MICC offices, most offices did not incorporate a standard contract filing system.



# Recommendations

- Further scrutinize the use of sole-source contracts to ensure that competition requirements are being met, and that fair and reasonable prices are being negotiated.
- Evaluate the process of using independent government estimates (IGE) as a tool for ensuring fair and reasonable prices.
- Explore using contract options or award term incentives in the procurement of recurring services to help streamline the contracting process and reduce the time required to award contracts.
- Explore the acquisition planning and requirements management processes to identify the cause for the higher level of contract modifications for R and S type services.



# Recommendations

- Insist on complete and accurate contract file documentation in the acquisition of services. FAR provides policy and regulations for contract file documentation that should be used to ensure government records are maintained appropriately.
- Adopt a project management approach to the acquisition of services. This approach includes establishing project teams consisting of cross-functional representatives involved in services acquisition. This approach also includes a dedicated project manager to lead the acquisition effort, as well as established roles and responsibilities for each of the project team members.
- In addition to having filled acquisition billets, emphasis should also be placed on ensuring that acquisition personnel are properly trained, educated, and experienced in their functional specialty areas, such as project management, contracting, and COR.



# Questions?

