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A Take on Effective  
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**The magazine for the International Cost Estimating & Analysis Association**



**The 2017 Professional Development &  
Training Workshop Retrospective**

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The Magazine for the International Cost Estimating & Analysis Association

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The International Cost Estimating and Analysis Association is a 501(c)(6) international non-profit organization dedicated to advancing, encouraging, promoting and enhancing the profession of cost estimating and analysis, through the use of parametrics and other data-driven techniques.

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# President's Address

*Paul Marston,  
ICEAA International President*

It's hard to believe it's been two years already! It is an honor to have been elected by our membership for my second term as ICEAA International President. The newly elected board's term officially began on July 1, 2017 and we will remain in place until July 1, 2019. Thanks to the nominating committee, chaired by **Brian Glauser**, for all of their efforts in screening the candidates in compliance with the ICEAA bylaws, and to all the members who took the time to cast your votes. The board is dedicated to serving the membership, making sure your needs are met, challenges recognized, and ultimately, making ICEAA the most valuable association it can be for you.

We have accomplished much in the last two years: our financial situation is steadily improving from the valley into which we had fallen when we were first getting started as ICEAA. We have expanded upon the services to our membership and made vast improvements on those in place. The board has been and continues to work on adjusting our bylaws to clarify and codify what ICEAA does, what it means to be a member, and how to be an active participant. Attendance at the annual Professional Development & Training Workshop is growing, reaching levels not seen in over ten years. We have established and are expanding communication and participation from our constituents in the US government and abroad.

These enhancements have positioned us to take the next steps forward as a professional organization. A complete upgrade of CEBOK, from content to delivery platform is underway. Our Software Cost Estimating Body of Knowledge and corresponding certification program is near completion, as evidenced by its introduction at the 2017 Professional Development & Training Workshop. The lessons we have learned from increasing communication with our government constituents will be utilized to broaden our relationships with representatives from industry corporations. And our

burgeoning efforts to strengthen and revitalize our chapters will yield greater local and regional participation.

These programs will all take a considerable amount of effort and funding to truly take shape. Outreach won't be enough to make these all happen – they will take some in-reach too. We will be working hard to involve a greater number and greater variety of members to volunteer to help get these ideas off the ground, and thanks to our strengthened budget, we will have the funding to back up the volunteer effort with the money necessary to do things right.

If you have specific questions for me or the board, be sure to send those to us when you sign up for the 2017 All-Member Virtual Meeting on **September 14** at noon eastern. While we expect the turnout to be too high to have live interaction, we will be covering as many of your suggested agenda topics and questions as we can.

Much of this issue of *ICEAA World* is dedicated to the 2017 Professional Development and Training Workshop, and I would like to add my acknowledgements to the many you will read here. Congratulations to all of our best paper and association award winners and thanks to the training instructors and paper presenters. Thanks to the entire workshop planning team, chaired by **Rich Harwin** and **Christina Snyder**, for contributing so much to the program's success, and thanks to the International Business Office staff of **Sharon Burger**, **Megan Jones**, and **Joe Wagner** for putting all the pieces together.



2017 All-Member Virtual Meeting

September 14 | noon Eastern

Sign up and send in your questions at  
[www.iceaaonline.com/membership](http://www.iceaaonline.com/membership)

# Business Office Update

*Megan Jones, ICEAA Executive Director*



**J**ust as fast as it came, there it went: another awesome Professional Development & Training Workshop! I know I had an absolute blast in Portland, whether reconnecting with familiar faces or making new friends, hanging out at the networking receptions or venturing out into Portland for amazing food and outstanding local brews. I hope this year's special Workshop section similarly evokes everyone's fond memories of Portland and gets you all psyched for Phoenix!

Thanks to our photographer, **Doug Cody**, who crammed thousands of words into this year's photos; the Workshop Planning Committee for all of their time, effort, and energy into making Portland a huge success; and most especially to **Sharon Burger** and **Joe Wagner** for just about everything else.

Aaah, summer. The time of year at the International Business Office when the flames of workshop preparation and execution have died and we can tend to the softly-glowing embers that warm the ICEAA

membership experience.

Recent CCEA® Exam applicants and recertifying certification-holders will have already noticed the new online forms for submitting exam and recertification applications at [www.iceaaonline.com/certification](http://www.iceaaonline.com/certification) and those who have checked out the 2017 Workshop proceedings may have noticed the new searchable archives page, featuring the papers from 2014-2017 at [www.iceaaonline.com/archives](http://www.iceaaonline.com/archives). We'll be adding more to the archives as the year blazes on.

And blaze on it will, with those cool charcoals catching fire right after labor day. There's the All-Member Meeting on **September 14**, and of course the **29th Annual International Integrated Program Management Workshop**, October 30-November 1. As of writing, one of you has already gotten your abstract in for 2018, but the rest of you have until **December 4**.

Flame on, ICEAA! By this time next year we will have risen from the ashes of Phoenix!



## Introducing the ICEAA 2017-2019 International Board of Directors:

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# Letter from the Editor

*Joe Wagner, ICEAA World Editor*

I must begin this letter for the summer issue of *ICEAA World* with an apology to two Air Force gentlemen for an error that appeared in the spring edition. The article concerning the Air Force Institute of Technology (AFIT), was bylined with the name of **Lt Col Brandon Lucas**, the present Director of the Graduate Cost Analysis Program. Unfortunately for the byline attribution, the article was written, and reported the doings of, the previous Director of the program, **Lt Col Dan Ritschel**, now the Program Chairman. It was Dan who deployed to Afghanistan, and reported on his experiences as an Air Advisor in Kabul. My thanks also for his mention of the opportunity given to the AFIT cost graduate students by the ICEAA Greater Dayton chapter, in which student presentations of their thesis projects were shared and discussed with over 40 chapter members. My thanks to Chapter President **Donna Gravely** and her staff for maintaining their ongoing support for the AFIT program. Again, my apologies to both Dan and Brandon.

Among the many quality articles that are offered for publication in *ICEAA World*, there are occasionally some pretty unique and thought-provoking subject areas addressed. They take a common notion or problem, and present it with a new viewpoint or perspective – a different way of looking at a common situation. Now battling two for two in originality of perspective is Air Force **Captain Greg Brown**, who follows up his thought-provoking spring issue article on the “Fermi Problem” (*Simplify an Estimating Problem: Channeling Enrico Fermi*) with another short but enlightening article titled *Measuring the Increasing Relevance of Cost Estimating*. What an interesting approach he has to thinking about our cost work and the changing role it seems to play in the political process.

Speaking of Air Force cost staff contributions, appreciation also goes out to **Captain Ryan L. Coker**, who prepared the article on the value of Earned Value Management in cooperation with **Colonel David Peeler**, who also provided his always-reliable book review for this issue.

I was very pleased with your many responses to our offer of free books as a result of our move to new quarters. We had about a dozen takers who relieved us of some 30 volumes and in the process grew their own personal libraries.

Our June week in Portland for the 2017 ICEAA Professional Development & Training Workshop brought the usual schedule of travel, registrations, receptions, meetings, training, and presentations. The anticipation of a “fleet week” Navy appearing on our doorstep in the Willamette River added to the excitement. See all the news on Portland 2017 in reports from our Executive Director, ICEAA President, and others in this issue. Not to get too far ahead of ourselves – but why not plan for a firebird in your future? – we are going to Phoenix next year. And Sedona or the Grand Canyon are not that far away.

## Upcoming Events

### ICEAA All-Member Virtual Meeting

September 14, 2017  
[www.iceaaonline.com/membership](http://www.iceaaonline.com/membership)

### Society for Cost Analysis & Forecasting (SCAF) Workshop

Westminster, London, UK  
 September 12, 2017  
 Contact: [ndmorrell@dstl.gov.uk](mailto:ndmorrell@dstl.gov.uk)

### IFPUG International Software Measurement & Analysis Conference

Cleveland, OH  
 September 13-15, 2017  
[www.ifpug.org](http://www.ifpug.org)

### 2017 Integrated Program Management Workshop

Bethesda, MD  
 October 30 - November 1, 2017  
[www.ipmworkshop.org](http://www.ipmworkshop.org)

### SCAF Workshop

*Vender and Services Day*  
 Filton, Bristol, UK  
 November 14, 2017  
 Contact: [ndmorrell@dstl.gov.uk](mailto:ndmorrell@dstl.gov.uk)

### 2019 ICEAA Professional Development & Training Workshop

Tampa, Florida  
 May 14-17, 2019



# Cost Analysis/Estimating Trends from an Industry Perspective

*Greg Kiviat, ICEAA Secretary*



Several key trends highlight the importance of cost analysis, estimating, and affordability management in developing credible estimates and curbing overall program cost growth within the private industry side of systems development, production, and support. Those of us with any amount of experience already know that cost analysis is far more than multiplying and adding numbers to create an estimate. But for the general public, or new analysts just entering the profession, the complexity of the job may not be so obvious.

A good cost analyst must develop a wide set of skills, cultivate networks of subject matter experts, and collect, analyze and apply data to create the next estimate. The broad understanding needed to determine the impact of advancing technologies in engineering, manufacturing and supportability (as well as programmatic and financial variables) is what makes our job interesting. We provide information and guidance to OEM (Original Equipment Manufacturers) program and government managers so they can make informed decisions to achieve cost goals and best value solutions.

Below is a (not necessarily complete!) list of some recent trends that I think cost analysts should be aware of as increasing demand tests our capabilities.

**1 Operating & Support Cost** – O&S costs are becoming a key attribute in customer source selections. O&S costs may be incurred for up to 50 years and may represent more than 2/3 of the overall program cost. Estimating skills in this area are increasingly valuable to OEM and customer organizations.

**2 Conduct Cost Analysis Earlier** – Early and continuing consideration for future costs throughout the product life cycle (development, production and O&S) is becoming integral to the design process. The ability to influence program cost decreases with solidifying requirements and design maturity.

**3 Supply Chain/Purchasing** – Supply chain has an increasing role in cost containment throughout the product life cycle. 40 years ago OEMs “made” 60-70% of an aircraft, now suppliers often provide up to 80% or more of final content. Cost analysts must be part of the supply chain discussions.

**4 Technology** – Rapid technology changes require that cost estimators/analysts become familiar with potentially disruptive cost trends in design, manufacturing and support. The analyst/estimator must develop methods to account for trends and apply them to new or ongoing programs

**5 Communications** - Cost analysts require increased ability to communicate with engineering, program, financial and other functional groups to collect and provide information to program managers at all phases in the product life cycle. Clear, concise and complete communications help cost analysts contribute to developing requirements, design, production and support scenarios to achieve performance and cost goals.

**6 Risk** – As OEMs are asked to assume more program risk from government customers, cost analysts are being asked to provide more insight into that risk. The skills needed to provide that analysis is a critical part of the increasing need.

**7 Skills and Training** – The skills needed to do credible cost analysis are increasingly wide and deep. Cost analysis requires an ongoing commitment to learning new skills and ideas. Every project is different and requires an ability to be flexible in approach.

Along with on the job experience and internal training, ICEAA can be an important part of any cost analyst's career development. Consider ICEAA training and certification to gain specific knowledge not generally covered in day to day activities or in most academic settings. Also, take advantage of peer review and networking opportunities by participating in local ICEAA chapter and international workshops.



# What ICEAA Membership Means to Me

*Kicked off by ICEAA International President Paul Marston in our Summer 2016 issue, ICEAA World will be featuring a new testimonial from a long-time member each issue where we get to hear what made them want to become a member, what got them heavily involved in ICEAA, and what keeps them coming back. This issue, we reached out to the folks at PRICE Systems to get a variety of perspectives:*

I attended a few ISPA events early in my career, and at the time I thought it was a nice way to get out of the office for the day and see what else was going on in the world. After visiting just a few events in Southern California, I found the group to be a very welcoming community of friendly faces, and a wealth of experience. As a fresh face, I was quickly identified by veterans like **Steve Sterk**, as someone who really needed to be more involved; he invited me to assist in membership activities at each ICEAA SoCal event. This was about the time I started working with PRICE and had the opportunity to attend the events on a regular basis. It wasn't long before I was nominated as the Secretary of the ICEAA SoCal Chapter, and with that title I have had the opportunity to help coordinate our quarterly events, inviting and introducing speakers, assuring we have a nice location and even food for the events. I have been the Secretary for about 3 years and the position has brought me closer to brilliant fellow members in California as well as respected members from across the country. My involvement has also enabled me to attend the international workshops in many lovely locations, and participate by delivering training modules, acting as a track chair, and learning from speakers bringing experience and knowledge from around the world. ICEAA is an excellent forum for learning and sharing, and I look forward to participating in the organization for years to come.

**Melissa Winter**  
*Solutions Architect, PRICE Systems*



*Melissa Winter (R) with Steve Sterk (L) at the 2014 ICEAA Workshop in Denver*

When I started my career in cost estimating I attended my first ISPA conference in 1986. As a young estimator I immediately connected with a community willing to help with best practices and leading edge methodologies. I remember the excitement of the “early days” as parametric estimating grew in acceptance and how I applied it directly to my projects. I often refer to past presentations / journal articles on various aspects of cost estimating, and continually find the community helpful and friendly when approached.

I enjoy the camaraderie of being in touch with other “birds of a feather” from different companies and exchanging ideas on best practices and experiences in the field. I also enjoy the opportunity to present papers on and help others get into the profession.

Today at PRICE Systems, sponsoring ICEAA events is an invaluable opportunity for us to connect with our current and prospective client base, share exciting developments with TruePlanning and present papers on leading edge concepts such as predictive cost analytics. I enjoy seeing the younger estimators entering the community and often think of how I started out in 1986 and what a wonderful resource ICEAA will be for them as their career develops.

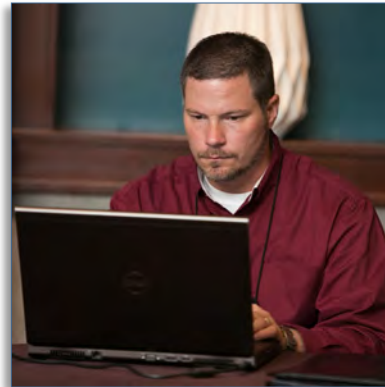
**Zachary Jasnoff**  
*Vice President of Services, PRICE Systems*

In 2009 I was introduced to federal employment and government cost estimating. I joined ICEAA shortly after to educate myself in the expectations and requirements of my position as a cost estimator. I had the opportunity to attend the ICEAA conference during my tenure with Department of Defense, Air Force, and made many contacts, attended informative, educational presentations, and gained insight and skills. ICEAA played a significant role then, and continues to impact my learning and growth as a cost management professional. The training opportunities provided by ICEAA are invaluable and the “rate of return” from being a member is outstanding!

**Laura Gurule**  
*Solutions Architect, PRICE Systems*



In early 2008, I was a resident student at the Air Force Institute of Technology (AFIT) studying cost analysis. I was new to the career field. Our program director, Lt Col **Eric Unger**, told us about what was then known as SCEA. AFIT and the local SCEA chapter had a close working relationship, particularly regarding thesis presentations and sponsorship of thesis topics.



*Joe Bauer hard at work at the 2016 ICEAA Workshop in Atlanta*

Our class also had the benefit of being geographically close to most of the major Air Force acquisition leadership. Leaders would visit AFIT to discuss general acquisition topics. One person in particular (Col **David Peeler**) talked about what we were learning in school and how it applied at a more strategic level within the Air Force. Col Peeler is also a frequent contributor to ICEAA at a local and national level. His support of the organization lent instant credibility to my consideration for joining.

As I learned more about the career field and certification/training opportunities, it seemed like a logical progression to join our primary professional development organization. I joined as a student at AFIT and have been a member of SCEA, and now ICEAA, ever since.

I always like to say that I enjoy being the dumbest person in the room. In other words, I find it helpful to surround myself with people that have extensive depth and breadth of knowledge as well as experience. I've been involved in cost estimating for nearly 10 years. In those 10 years, I'm amazed at how much more there is out there to learn and master. You can't learn new things if you don't surround yourself with folks that have "been there, done that."

ICEAA is an organization that attracts and retains smart and experienced people. At my very first ICEAA conference in 2009, I was blown away at the quality and quantity of training available. The technical level of the papers was impressive. I knew at that conference that ICEAA (then SCEA) was an organization I was going to remain involved in for years to come.

Being a part of ICEAA, and being a certified cost estimator / analyst, instantly lends credibility to my work. From a simple "CCEA" noted on my business card, folks automatically assume I've completed rigorous training and testing. The continuous education opportunities at the local and national level ensure I'm kept abreast of the latest industry trends. All of this better prepares me to tackle that next estimate with confidence.

PRICE Systems is synonymous with ICEAA. PRICE has supported local and national events for years. In fact, SCEA and ICEAA grew out of what was known as the PRICE Users Group. Our team takes pride in leading the pack with quality cost research and estimating tools/services. The goals of PRICE are absolutely in line with the goals of ICEAA. As we continually sponsor events, the larger cost estimating community has many opportunities to learn about our company and how we support their desired end state of producing accurate, credible and defensible estimates quickly.

**Joe Bauer**

*Solutions Architect, PRICE Systems*



## ICEAA All-Member Virtual Meeting

### September 14, 2017 12:00 noon Eastern

Join us online for our annual meeting where members can get an update on the state of the association and a forecast of initiatives for the coming years

Sign up and send us your questions and agenda topics by September 1 at:  
[www.iceaaonline.com/membership](http://www.iceaaonline.com/membership)



# Certification Corner

*Peter Andrejev, CCEA®, PMP®  
ICEAA Director of Certification*

I recently had the privilege of serving on a national committee to identify and articulate ICEAA's value proposition. We spent hours dissecting our various constituencies, investigating their interests, and formulating messaging pieces. When the dust cleared, several themes emerged that have universal appeal to both inexperienced and seasoned staff members, and to government or private sector employers.

Foremost among these propositions is the professional certifications that ICEAA offers. For both the practitioner and the employer, certification is a recognized indicator of the individual's level of competency. Certification is a valuable asset to let the analyst separate themselves from other candidates, and to let the employer filter among applicants.

Beyond certification, many other elements of our value proposition warrant consistent and persistent messaging. However, until we design and launch a messaging campaign, please feel to share ICEAA's value proposition whenever asked. Simplistically, ICEAA offers a convenient opportunity and professional platform to:

- ✓ Earn certification credentials
- ✓ Receive foundational and specialized training
- ✓ Present, publish, and/or teach on cost and related topics
- ✓ Find candidate employees or a new job
- ✓ Gain recognition for your or your team's achievements and accomplishments
- ✓ Build/extend your professional network
- ✓ Access senior level and/or cross-sector forums

These are some of the key elements to ICEAA's overall mission to engage with the cost community with the opportunity to exchange ideas, information, and methodologies with international experts in the field.

What do you see as the most valuable aspects of your ICEAA membership? Was there something that made you a member or keeps you a member that you're not seeing here? Email the International Business Office with your suggestions! Like most value propositions, this is a living document that only improves with more input.



## WANTED: CCEA® and Specialty Exam Test Questions

For enhancing the portfolio of questions in ICEAA exams,  
study guides and training materials

### 1. Topic Category

Parametric Estimating:

### 2. Topic

CER

**3. Question** If a CER for Site Development was developed giving the relationship,  $y$  (in \$K) =  $31.765x + 145.32$  (where  $x$  is the number of workstations) for a data set cost driver that had a range minimum of 2 workstations to 52 workstations, and the independent variable has tested positively for significance, the predicted cost for a site that had 33 workstations would be:

### 4. Five multiple choice answers

- a. \$ 1,193.57
- b. \$1,193,565.00
- c. \$ 1,797.10
- d. \$1,797,100.00
- e. \$ 208,850.00

**5. Answer** B

### 6. Solution:

$y = 31.765 * 33$   
 $+ 145.32 = 1,193.57$   
but must convert from  
\$K; value is 1,193.57 \*  
\$1000 = \$1,193,565

### 7. Reference

CEBoK Module 3

## REWARD: RECERTIFICATION POINTS

Contact the ICEAA Office or Director of Certification for details

# Earned Value Management and Contracting: A Take on Effective Affordability Measures

Captain Ryan L. Coker and Colonel David L. Peeler, Jr.

***Disclaimer:** This paper is the product of Captain Coker's year in an education with industry assignment at Ball Aerospace and Technologies Corporation (BATC) in Broomfield/Boulder, Colorado. The views of this paper are those of the authors and do not necessarily reflect the official position of the industry partner, the U.S. government or the U.S. Air Force.*

## Introduction:

Earned Value Management (EVM) is an effective tool for monitoring and projecting costs in relation to a program's schedule and performance accomplishment, but the value of this tool may be diminished or even outweighed by the costs associated with its implementation and administration. Does the information obtained provide a benefit that exceeds the cost of implementing and operating?

And what can be done to improve the value of information provided relative to its cost? To start the discussion, let's review the EVM application requirements as directed in DoD 5000.02 guidance, shown in Appendix A.<sup>1</sup> There are two monetary amounts to consider for planning EVM application to a contract. There is the \$20 million minimum contract value that triggers any EVM application requirement, and the \$50 million contract value that is the minimum value requiring a full government compliance validation of the contractors EVM processes as stated in the ANSI/EIA-748 criteria, and submission by the contractor to the government program office of the full range of Integrated Program Management Reports (IPMRs).

*a full EVM application  
may not be in the best  
interest of the  
government*

EVM application and reporting for contracts below \$20M is at the discretion of program management. Between the two values of \$20M and \$50M, government managers are required to meet the ANSI/EIA-748 criteria, but they are given the flexibility to tailor the IPMRs to meet government needs, and the contractor's EVM processes do not have to undergo a formal compliance review. Examining this data, whatever the formats, by both the contractor and government staff can be very time consuming and contributes to the overhead labor costs for the program.<sup>2</sup>

Even after the data is analyzed, analyst errors might result in flawed conclusions based on any number of misapplied factors or procedures, and therefore provide inaccurate information regarding the true direction of the program.<sup>3</sup>

Despite the regulations that require utilizing the complete EVM process for programs over \$20M, a full EVM application may not be in the best interest of the government based on the unique nature of each program. A waiver process does exist for those situations, but it only waives the full EVM implementation requirement on a case by case basis. Even if a waiver is approved for acquisitions over

*continued*

<sup>1</sup> Kendall, F., Gilmore, M. & Halvorsen, T. (2015, January 7). Department of Defense Instruction Number 5000.02: Operation of the Defense Acquisition System. Office of the Under Secretary of Defense for Acquisition, Technology and Logistics. <http://www.dtic.mil/whs/directives/corres/pdf/500002p.pdf>

<sup>2</sup> BATC Employees. Personal interviews and e-mails. [Views expressed by the BATC Employees interviewed are personal opinions and observations and are not to be considered the views of BATC as an entity.]

<sup>3</sup> BATC Employees and Sanders, C. (8 & 25 February 2016). Personal interviews.



ACAT	Reason for ACAT Designation	Decision Authority
ACAT I	<ul style="list-style-type: none"> <li>MDAP (10 U.S.C. 2430 (Reference (g))) <ul style="list-style-type: none"> <li>Dollar value for all increments of the program: estimated by the DAE to require an eventual total expenditure for research, development, and test and evaluation (RDT&amp;E) of more than \$480 million in Fiscal Year (FY) 2014 constant dollars or, for procurement, of more than \$2.79 billion in FY 2014 constant dollars</li> <li>MDA designation</li> </ul> </li> <li>MDA designation as special interest<sup>1</sup></li> </ul>	ACAT ID: DAE or as delegated  ACAT IC: Head of the DoD Component or, if delegated, the CAE (not further delegable)
ACAT IA <sup>2,3</sup>	<ul style="list-style-type: none"> <li>MAIS (10 U.S.C. 2445a (Reference (g)))<sup>4</sup>: A DoD acquisition program for an Automated Information System<sup>5</sup> (AIS) (either as a product or a service<sup>6</sup>) that is either: <ul style="list-style-type: none"> <li>Designated by the MDA as a MAIS program; or</li> <li>Estimated to exceed: <ul style="list-style-type: none"> <li>\$40 million in FY 2014 constant dollars for all expenditures, for all increments, regardless of the appropriation or fund source, directly related to the AIS definition, design, development, deployment, and sustainment, and incurred in any single fiscal year; or</li> <li>\$165 million in FY 2014 constant dollars for all expenditures, for all increments, regardless of the appropriation or fund source, directly related to the AIS definition, design, development, and deployment, and incurred from the beginning of the Materiel Solution Analysis Phase through deployment at all sites; or</li> <li>\$520 million in FY 2014 constant dollars for all expenditures, for all increments, regardless of the appropriation or fund source, directly related to the AIS definition, design, development, deployment, operations and maintenance, and incurred from the beginning of the Materiel Solution Analysis Phase through sustainment for the estimated useful life of the system.</li> </ul> </li> </ul> </li> <li>MDA designation as special interest<sup>1</sup></li> </ul>	ACAT IAM: DAE or as delegated  ACAT IAC: Head of the DoD Component or, if delegated, the CAE (not further delegable)
ACAT II	<ul style="list-style-type: none"> <li>Does not meet criteria for ACAT I or IA</li> <li>Major system (10 U.S.C. 2302d (Reference (g))) <ul style="list-style-type: none"> <li>Dollar value: estimated by the DoD Component head to require an eventual total expenditure for RDT&amp;E of more than \$185 million in FY 2014 constant dollars, or for procurement of more than \$835 million in FY 2014 constant dollars</li> <li>MDA designation<sup>6</sup> (10 U.S.C. 2302 (Reference (g)))</li> </ul> </li> </ul>	CAE or the individual designated by the CAE <sup>6</sup>
ACAT III	<ul style="list-style-type: none"> <li>Does not meet criteria for ACAT II or above</li> <li>An AIS program that is not a MAIS program</li> </ul>	Designated by the CAE <sup>6</sup>

1. The Special Interest designation is typically based on one or more of the following factors: technological complexity; congressional interest; a large commitment of resources; or the program is critical to the achievement of a capability or set of capabilities, part of a system of systems, or a joint program. Programs that already meet the MDAP and MAIS thresholds cannot be designated as Special Interest.

2. When a MAIS program also meets the definition of an MDAP, the DAE will be the MDA unless delegated to a DoD Component or other official. The DAE will designate the program as either a MAIS or an MDAP, and the Program Manager will manage the program consistent with the designation.

3. The MDA (either the DAE or, if delegated, the DoD Chief Information Officer (CIC) or another designee) will designate MAIS programs as ACAT IAM or ACAT IAC. MAIS programs will not be designated as ACAT II.

4. AIS: A system of computer hardware, computer software, data or telecommunications that performs functions such as collecting, processing, storing, transmitting, and displaying information. Excluded are computer resources, both hardware and software, that are an integral part of a weapon or weapon system; used for highly sensitive classified programs (as determined by the Secretary of Defense); used for other highly sensitive information technology (IT) programs (as determined by the DoD CIO); or determined by the DAE or designee to be better overseen as a non-AIS program (e.g., a program with a low ratio of RDT&E funding to total program acquisition costs or that requires significant hardware development).

5. When determined by the USD(AT&L) (or designee), IT services programs that achieve the MAIS threshold will follow the procedures applicable to MAIS programs specified in this instruction. All other acquisitions of services will comply with Enclosure 9 of DoD Instruction 5000.02 (Reference (h)) until cancelled by issuance of the new acquisition of services instruction.

6. As delegated by the Secretary of Defense or Secretary of the Military Department.

Appendix A: DoDI 5000.02, Table 8. EVM Requirements  
Adapted from Kendall, F., Gilmore, M., & Halvorsen, T. (7 January 2015)

\$50M, the government program manager must still use their own “EV Lite” method to obtain the necessary data to properly monitor program performance. In an attempt to offer more flexibility for internal program oversight, Ball Aerospace & Technologies Corporation (BATC) is implementing a two-tier EVM management process for Government contracts that allows BATC employees to utilize EV Lite and make decisions regarding how they will customize reporting of the EVM data that will be collected.<sup>4</sup> This approach offers an internal, tailored method to the BATC Program Manager that does not require Government approval as the BATC process is not Government driven. As shown by BATC’s desire to implement this EVM initiative, increasing the flexibility of EVM applications can be an extremely beneficial resource for program

<sup>4</sup> BATC Employees. Personal interviews and e-mails. [Views expressed by the BATC Employees interviewed are personal opinions and observations and are not to be considered the views of BATC as an entity.]

managers, both company and government. However, linking a rigidly applied full EVM to a fixed threshold without the ability to tailor data gathering reduces the ability of Air Force leaders to make sound business judgements about tradeoffs between the value of data collection/analysis and the cost of gathering such data.

The federal government’s EVM System guidance comes from the Office of Management and Budget (OMB). EVM requirements are managed by OMB and flowed down to the Air Force through implementing regulations. Therefore, any changes to the requirements requires Air Force advocacy to the Department of Defense (DoD) and back to OMB. The overall process would benefit if OMB, the DoD, and the Air Force considered modifying existing EVM regulations, by allowing implementation of an “EV Lite” process like that used by BATC to encourage better business judgement and better bridge gaps between EVM affordability and usefulness. As an acquisition

community, we should also capitalize on existing EVM information required by other mandates and capture these cost savings to further the affordability movement. If we create a more cost effective EVM requirement and eliminate excessive data gathering and redundancies, we can further stretch our constrained budget dollars.

### Advocacy:

The contracting function is deeply intertwined with the implementation of EVM requirements between the government and the contractor. However, once in operation on a contract, EVM is a program management function often operated/executed by financial management personnel. Government program managers utilize the EVM data to make better informed decisions. Nevertheless, contracting plays a vital role in implementing the EVM process and therefore the affordability of the specific

*continued*

## *The OMB should take a deeper look into usage of the EVM waiver process and consider streamlining the procedures*

contractual requirements. The contracting office helps to determine the type of contract, which is a part of the decision process of whether or not EVM is required. This decision regarding contract type is based on numerous factors, including a risk assessment, in which contracting plays an important role on the acquisition team to formulate a risk management plan. The maturity of the program also helps contracting determine the type of contract to utilize. The EVM concept affects numerous parties in the acquisition community; and affordability should be driven at all levels in the acquisition process.

From a contractual standpoint, EVM is used on cost and incentive type contracts above the \$20M threshold.<sup>5</sup> This usage requirement promotes an all or nothing approach. EVM as a contractual requirement should also take into consideration the type of acquisition being performed. Through discussions with a former Air Force program manager, it appears that on some Research and Development (R&D) contracts EVM may not be the best tool for monitoring costs, schedule, and performance.<sup>6</sup> R&D and similar more unpredictable contract efforts lean towards an open-ended environment, with sometimes unpredictable program developments. The nature of R&D efforts include adjustments that can drive unplanned cost changes. Such variations in cost result in baseline adjustments. As a result, the principle behind using EVM and IPMR formats is potentially undermined in R&D and similar efforts. Regarding large production contracts and similar efforts that benefit from stable requirements, it makes sense to use EVM and the IPMR formats, as the government program manager better benefits from the results.<sup>7</sup> Currently, an EVM waiver process does exist to remove the EVM requirement from an acquisition. However, the waiver process may not be an exercisable option or utilized as desired by program

management leadership.<sup>8</sup> The OMB should take a deeper look into usage of the EVM waiver process and consider streamlining the procedures to encourage customization per the various requirements of the OMB. Recent DoD efforts have expanded upon this movement towards more cost-effective and prudent procurement techniques.

Since 2010, the DoD has begun implementing Better Buying Power (BBP) initiatives. As summarized in *BBP Background*, each version addresses different aspects of the acquisition process.<sup>9</sup> However, they all center on acquiring necessary end products/services for the U.S. government at an affordable price. Each subsequent version builds upon previously issued BBP initiatives and further focuses on the issues facing DoD acquisitions. BBP 3.0 specifically builds upon BBP 2.0 "...to reduce the frequency of reviews and unproductive processes and bureaucracy for both industry and government, and to emphasize the role of the acquisition chain of command."<sup>10</sup> This language embodies the affordability spirit of BBP and the desire to acquire products/services shrewdly. The EVM tool and the subsequent IPMR formats should be assessed as a whole to reduce potential procedural inefficiencies and to further increase cost savings. The Joint Space Cost Council conducted an EVM System survey and one of their recommendations suggested "...[o]ptimizing for affordability does not mean sacrificing necessary insight into major development programs. The focus needs to be on the consideration of the cost versus benefit of data that the Government needs."<sup>11</sup> The utilization of EV Lite supports a positive cost/benefit determination, while still providing desired government insight to ensure mission success.

*continued*

<sup>5</sup> Kendall, F., Gilmore, M. & Halvorsen, T. (7 January 2015). *Department of Defense Instruction Number 5000.02: Operation of the Defense Acquisition System*. Office of the Under Secretary of Defense for Acquisition, Technology and Logistics. <http://www.dtic.mil/whs/directives/corres/pdf/500002p.pdf>

<sup>6</sup> Sanders, C. (8 & 25 February 2016). Personal interviews.

<sup>7</sup> Ibid.

<sup>8,9</sup> Bembers, I., Jones, M., Knox, E., & Traczyk, J. (15 April 2015). *Joint Space Cost Council (JSCC): Better EVMS Implementation Themes and Recommendations*. Retrieved from [http://www.acq.osd.mil/evm/docs/JSCC Better EVM Implementation Recommendations 15 April 2015.pdf](http://www.acq.osd.mil/evm/docs/JSCC%20Better%20EVM%20Implementation%20Recommendations%2015%20April%202015.pdf)

<sup>10</sup> Better Buying Power Background. Retrieved from: <http://bbp.dau.mil/background.html>

<sup>11</sup> Kendall, F. (9 April 2015). *Implementation Directive for Better Buying Power 3.0 – Achieving Dominant Capabilities through Technical Excellence and Innovation*. Office of the Under Secretary of Defense for Acquisition, Technology and Logistics. [http://www.acq.osd.mil/fo/docs/betterBuyingPower3.0 \(9Apr15\).pdf](http://www.acq.osd.mil/fo/docs/betterBuyingPower3.0%20(9Apr15).pdf)



**Appendix B**  
BATC EVM Application Table<sup>1</sup>

Dollar Value	Contract Type	Tier <sup>2</sup>	Requirement
Acquisition ≥ \$20M	Cost Plus/Incentive	1	Full EVM (See Appendix A)
\$1M ≤ Acquisition < \$20M	FFP/Cost Plus/ Incentive	2	EV Lite: Not required to use full EVM, but can assign necessary EVM aspects based on the acquisition
Acquisition < \$20M	Cost Plus/Incentive	1	Full EVM: Only if determined appropriate (See Appendix A)
Acquisition is any dollar value	FFP	1	Full EVM: Only if determined appropriate (See Appendix A)

Notes:

1. This is not a table created by BATC, but was adapted based on BATC's proposed Tier program and current EVM requirements.
2. Tier 1 is the requirements that are regulated by Part 7 of OMB Circular A-11. Tier 2 is BATC's unique approach. Tier 2 applies when the contract has at least one-year period of performance and delivers hardware.

Currently, as noted, OMB requires all EVM guidelines implemented for efforts above \$20M, but they allow for IPMR tailoring within the set guidelines (see Appendix A). This standardized EVM approach is not in the best interest of the DoD. Industry is showing that full EVM is not the only option to successfully run a program. After discussions with the EVM Lead, BATC is currently in the process of implementing an internal two-tiered EVM approach (see Appendix B). BATC follows the regulations for EVM at and above the \$20M threshold, referred to as Tier 1; but they utilize EV Lite (Tier 2) when the acquisition is a firm fixed price (FFP) or cost plus contract over \$1M, but less than \$20M, and has at least a one year period of performance delivering hardware. EV Lite is less structured than full EVM and does not require the use of all seven EVM formats.<sup>12</sup> With this approach, BATC, when assigning EVM taskers and formats, takes into consideration the type, value, risks, schedule, and other aspects of the contractual requirement. Tier 2 provides the flexibility to adjust to a

*raise the threshold that  
triggers application of  
full EVM*

situation and associated risk. Under the \$20M threshold, they can choose to utilize EV Lite as they deem necessary and/or useful. As long as the requirement to implement full EVM does not exist, to include EVM waivers, BATC can utilize Tier 2.

The BATC tailorable mindset is something OMB and the Air Force should consider promulgating, as each situation varies to some extent. The OMB has already made strides to promote customization, allowing tailored IPMR formats.<sup>13</sup> The formats presented to government can include much of the costs associated with EVM data.<sup>14</sup> However, they should not stop with that approach. With the current EVM regulations, three potential options exists for approaching an EVM vs EV Lite decision and application.

*continued*

<sup>12</sup> BATC Employees. Personal interviews and e-mails, as well as Captain Coker's time at Ball Aerospace.

<sup>13</sup> McGregor, J. & Bliss, G. (5 February 2016). *IPMR Implementation Guide*. Office of the Under Secretary of Defense for Acquisition, Technology and Logistics (PARCA). <http://www.acq.osd.mil/evm/docs/IPMR%20Implementation%20Guide.pdf>

<sup>14</sup> EVMS Education Center. *The Estimate at Completion – A Project Management Best Practice*. Retrieved from <https://www.humphreys-assoc.com/evms/estimate-completion-project-management-best-practice-ta-a-85.html>



### Option One:

Using BATC's situation-dependent approach described above, the OMB should raise the threshold that triggers application of full EVM and require the utilization of modified EVM or EV Lite below that new threshold. The decision should be made by the Milestone Decision Authority (MDA), unless the authority is delegated by the MDA – on a case by case basis. The delegation should go no lower than one level above the contracting officer. Ultimately, the requirement holder has a vested interest in the program and wants it to succeed. Even with assigning the decision to the appropriate leader in the chain-of command, the range of thresholds should exist to set expectations. Despite the aforementioned, raising or establishing thresholds is only the first action as it does not address the underlying issue. Increasing or adding thresholds represents movement away from the desired concepts of more independent and critical thinking. The OMB needs to alter its EVM methods and offer a situation-dependent approach, determined by the MDA. Per BBP 3.0, “[a]ffordability is now being reviewed as part of all milestone decisions.” Why would the MDA not evaluate the usage of EVM or EV Lite and its “affordability” on a case by case basis for each requirement? The affordability of EVM should be assessed once the requirement is established and reassessed throughout the acquisition life cycle – at each milestone decision.

Currently, EV Lite principals are allowed when EVM is not required, but further flexibility should be provided. There is no formalized/codified EV Lite definition or specified process apart from an acquisition team choosing to use certain EVM aspects, when full EVM is not required. Below the full EVM threshold, the MDA could implement EV Lite, as applicable to an acquisition effort, to tailor EVM. The acquisition team would still follow full EVM regulations when determined necessary. If the MDA deems EV Lite more appropriate, then he can determine to what extent in order to meet the cost/schedule objectives of the program. Conversely, the MDA could require full EVM below the established

*A particular government program manager...argued that data from EVM was not beneficial for his acquisition.*

threshold or they could rule out EVM below the threshold in general. Another alternative is MDA determination that full EVM is not practical for an acquisition that exceeds the threshold requirements and process a waiver, but still use the formalized EV Lite approach.<sup>15</sup> The EVM vs EV Lite decision would be made based upon a detailed risk assessment and an overarching evaluation of the situation that is presented. The DoDI 5000.02 states, “MDAs should tailor regulatory procedures in the document consistent with sound business practice and the risks associated with the product being acquired.”<sup>16</sup> Using comprehensive risk assessments

and decision making at the MDA-level would allow customization of the chosen approach to arrive at an educated business verdict for acquisition programs.

### Option Two:

If the suggested changes to EVM policy listed above are not practical, then the OMB, DoD,

and Air Force should consider another option. A particular government program manager discussed a requirement that was around \$150M in which EVM was utilized. EVM cost him approximately \$3M a year; he argued that data from EVM was not beneficial for his acquisition.<sup>17</sup> This opinion is a potential red flag, indicating something is broken. If this is the case, then the logic combats the affordability mindset. One could solely utilize Schedule Variance (SV) and Cost Variance (CV) and still get the desired results of EVM. SV and CV track the schedule and costs, respectively, in relation to what was planned for each at a specific time in the contract. Given this information, the government program manager can determine if a cost underrun or overrun exists and if the contract is behind or ahead of schedule. Utilizing SV and CV and removing the extra EVM processes would decrease the \$3M EVM cost.

*continued*

<sup>15</sup> Rivera, R. Personal interviews and e-mails.

<sup>16</sup> Kendall, F., Gilmore, M. & Halvorsen, T. (2015, January 7). *Department of Defense Instruction Number 5000.02: Operation of the Defense Acquisition System*. Office of the Under Secretary of Defense for Acquisition, Technology and Logistics. <http://www.dtic.mil/whs/directives/corres/pdf/500002p.pdf>

<sup>17</sup> Sanders, C. (8 & 25 February 2016). Personal interviews.

*some of the EVM information may already exist and could be given to the government very easily and at negligible cost.*

The OMB could start out with a test program. The test program could be used across several major defense acquisition programs as a pilot. Full EVM threshold requirements would remain the same, but the OMB could introduce an EV Lite approach for anything below \$20M. With this customizable tactic, the contractor would establish a detailed Work Breakdown Structure (WBS) and the government program manager would solely use the CV and SV aspects of EVM to assess a program's health. The government program manager would use the schedule performance indicator for overarching views and would establish variance reporting criteria so as to not create unnecessary reporting. If the test program results in a desired outcome, then the OMB could increase the threshold to \$50M and conduct EV Lite below \$50M.

### Option Three:

As a supplement to or completely separate initiative from the two EVM options above, option three focuses on utilizing existing information. After sitting through a few of BATC's estimate at completion (EAC) meetings and discussing the content with some employees, one notices BATC already collects some of the data that is included in the EVM tool. The EAC and its accuracy also pertains to compliance with the Sarbanes-Oxley Act (SOX). SOX was passed "to protect investors from the possibility of fraudulent accounting activities by corporations...[SOX] mandated strict reforms to improve financial disclosures from corporations and prevent accounting fraud." As a result, publicly traded companies must provide accurate information like the EAC in order to remain compliant. SOX requires precision and any "[u]nrealistic EACs reported in publicly owned companies are subject to the consequences of this Act." As discussed with a

*the benefits gained from EVM need to outweigh additional cost*

BATC employee, some of the EVM information may already exist and could be given to the government very easily and at negligible cost; but requiring contractors to convert data into standardized formats thwarts savings. The government could require industry to provide pre-existent information required by SOX; and use that information for the program. The government would need to understand and accept data not in prescribed formats. The IPMR formats are one of the major cost drivers when requiring EVM. If nothing else changes with the EVM System, the acquisition community should be actively encouraged to capitalize on existing contractor information required by non-DoD sources.<sup>18</sup>

### Additional Consideration:

Irrespective of the three options, EVM training needs reassessing. Analyzing EVM data without the proper training can render invalid results. A critical evaluation of program management responsibility and training with respect to EVM should be undertaken. The DoD could better utilize EVM information if people better understood the data provided and thus the warning signs available to their programs.<sup>19</sup> BATC provides training and certification for their employees to ensure they understand EVM and its requirements. Just as BATC utilizes EVM training to further develop its employees, the DoD should better train acquisition personnel with regard to EVM.

### Conclusion:

BATC's approach is still in the implementation stage. Therefore, data is not available to validate the ultimate outcome of aforementioned changes. However, the real questions are: Why did BATC

*continued*

<sup>18</sup> Investopedia. <http://www.investopedia.com/terms/s/sarbanesoxleyact.asp>; Public Law 107-204, July 30, 2002. Sarbanes-Oxley Act of 2002. Available at: <https://www.gpo.gov/fdsys/pkg/PLAW-107publ204/pdf/PLAW-107publ204.pdf>; and Kendall, F., Gilmore, M. & Halvorsen, T. (7 January 2015). *Department of Defense Instruction Number 5000.02: Operation of the Defense Acquisition System*. Office of the Under Secretary of Defense for Acquisition, Technology and Logistics. <http://www.dtic.mil/whs/directives/corres/pdf/500002p.pdf>. Another potential source of information that contractors already produce, for internal consumption, is work in process inventory.

<sup>19</sup> Wojcik, P. (6 June 2016). E-mails and personal interview.

implement their tiered system? What was the motivation behind their transition? The BATC EVM lead stated that the approach was advocated as more of a “strategic vision to ensure better understanding of when EVM is required or not... [The BATC] policy approach wasn’t clear.” After further discussions, the BATC EVM lead indicated that EVM should be conducted by program managers to some extent regardless of regulations and thresholds. This acknowledgement does not mean all EVM criteria are required of program managers, but monitoring costs, schedule, and performance are key elements of a their basic duties.

EVM serves as another valuable tool that government program managers can use, but it should not overshadow the program manager’s job or become an arbitrary cost driver. Conducting full EVM increases government oversight and drives additional costs. The contractor also has to assemble EVM data into the standard IPMR formats. Given the increased labor hours, the benefits gained from EVM need to outweigh additional cost. Calculating actual additional cost is difficult, as some information is already collected by contractors. The level of EVM customization should be determined by the MDA in order to avoid excess cost, based upon a detailed risk assessment and sound business judgement. Ultimately, EVM should serve more as a beneficial tool and not a fixed requirement.

No system is perfect; and while it is tough to perfect a tool in a large bureaucracy, a potentially more efficient method is worth consideration. The BATC EV Lite approach, with flexibility to tailor, is something the government should emulate. Given recent and future calls for paradigm shifts and outright reforms, the DoD should further envision the ability to make sound business decisions with EVM and other processes. Procedures that remain stagnant fail in comparison to innovative and adaptive business practices.



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\* Views expressed by the BATC Employees interviewed are personal opinions and observations and are not to be considered the views of BATC as an entity. (I21)



## 2017 Workshop Review

By Megan Jones



*Paul Marston welcomes us to the 2017 Professional Development & Training Workshop*

ICEAA's 2017 Professional Development & Training Workshop was yet another resounding success. Costers from around the country met up in Portland, Oregon - along with the thousands who came in for Portland's annual Rose Festival and Fleet Week - for 3 ½ days

of training and professional papers from June 6<sup>th</sup> to the 9<sup>th</sup>. This year's workshop section will be a great reminder of the awesome week our 400 attendees had, and give a sense of what everyone can look forward to next year in Phoenix!

We got started on Tuesday morning with the 2017 Best Paper Awards presentation. The Workshop featured over 75 paper presentations, which were broken out into five subject-based categories. Co-Chairs **Andrew Drennon** and **Rod Olin** handed out the awards for the best paper in each category and then the Best Paper Overall, which had been chosen from those five categories by a team of judges back in the spring. The winners are listed in this issue and their full papers and presentations are available on the ICEAA website for download.

Following the Best Paper Awards on Tuesday morning, we were joined by **Gordon M. Kranz**, who gave us

a long-range rearview of the past thirty years of cost estimating methods and approaches, and whether those changes have actually improved productivity and the ability to make accurate estimates. Mr. Kranz, prior to his retirement, served as Deputy Director at the Office of Performance Assessments and Root Cause Analyses (PARCA) for Earned Value Management.

Tuesday was a full day of breakout sessions and training workshops capped off with the welcome



*Tuesday Morning Keynote Speaker  
Gordon Kranz*

reception in the exhibit hall that evening - an awesome opportunity to meet with our sponsors and exhibitors, as well as a chance to get to know fellow attendees in a fun and relaxed environment.

Wednesday morning began with the presentation of the 2017 ICEAA Association Awards, emceed by Workshop Co-Chair **Rich Harwin**. Nominators joined the winners onstage to tell us a little more about why and for what they sent in their nominations. Detailed versions of those nomination statements are provided in the following pages.



*Dr. Mark Meckler explains what's at the intersection of value and values on Wednesday*

After the Association Awards on Wednesday morning, Dr. Mark Meckler from CraftingAStrategy.com gave a keynote that was, according to our attendee feedback survey, “the presentation I overheard many people discussing afterward and throughout the week.”

While Dr. Meckler and CraftingAStrategy teach the fundamentals of running a business to craft brewers whose passion is focused on the art of beer, his message of defining your product, understanding your market to know how to market to it, and providing value to your company and your customer resonated with attendees: “He highlighted the need to address your audience’s bias, not just rely on numbers to make a compelling argument.” Dr. Meckler certainly gave us a lot to chew on...or sip on as the case (case?!) may be.

Attendees and sponsors met up again Wednesday evening for our second networking reception of the week. The outstanding educational and professional development provided during the week is apparent in the quality of our members’ presentations, but what makes going to a workshop such a more fulfilling experience than sitting at your desk watching a YouTube or reading a PowerPoint is events like these. Attendees commented over and over in our feedback survey that the networking was the best part of the event, going as far as to say that it’s the “best spot to see and be seen for a contractor in cost estimating.”

The value of the networking goes beyond putting faces to names and getting what one commenter

called the “sense of belonging” for those in the “cost functions [who] often are outsiders to decision making in the industry.” Another attendee went further to say it’s an “excellent learning and sharing environment; everyone is happy to discuss their

particular challenges and provide ideas to help you overcome yours,” which was echoed by another who said, “the cross-pollination of ideas is of great value...they help you see things in a new light and how to approach a challenge from a new direction.”

We were back at it bright and early Thursday Morning, starting the day with a presentation from Dr. David Raffo from Portland State University, who introduced

us to Process Simulation Modeling, a data-driven, model-based, bottoms-up approach to cost estimation. His presentation gave us some real-world examples of how process simulation has been implemented within industry and government organizations to improve performance results and improve key process areas.

The last big event of the week was the Best Paper Overall presentation on Thursday right before lunch. 2017 was the third year we’ve featured the year’s best paper as a general session for all to enjoy. In years past, there had always been a problem with keeping the best paper in with the rest of the concurrent sessions: everyone wanting to see the best paper overcrowded the room, and left those unlucky enough to be scheduled at the same time without audiences. And the 2017 Best Paper Overall winner is...



*Thursday Morning’s  
Keynote Speaker  
Dr. David Raffo*

## 2017 Workshop Committee

### Workshop Co-Chairs:

Rich Harwin  
Christina Snyder

### Training Co-Chairs:

Remie Arnold  
Derreck Ross

### Keynote Co-Chairs:

Genevieve Burkett  
Bob Hunt

### Papers Co-Chairs:

Jeremy Goucher  
Karen Mourikas

### Best Paper Co-Chairs:

Andrew Drennon  
Rod Olin

### Association Awards

Chair:  
Joe Hamaker

## 2017 Best Papers



Best Paper Co-Chairs Rod Olin (L) and Andrew Drennon (C) present the Best Paper Overall Award to Chuck Alexander (R)

Congratulations to **Chuck Alexander** for his winning paper, *Technology Development Cost and Schedule Modeling*.

Chuck was selected as the winner for Best Paper in the Analysis Methods Category, and was then selected from the other category winners as the year's best.

Talk about the luck of the first-timer: this was Chuck's first time presenting at an ICEAA Workshop -and- his first time attending!

Chuck's presentation explored the critical challenge of leveraging parametric methods and data to better integrate cost and schedule estimate models with

technology road mapping, early systems engineering and conceptual design efforts.

Our thanks go out to all of the authors of this year's papers. By volunteering their time and expertise, they are not only providing an invaluable service to ICEAA members and Workshop attendees, but are sharpening the cutting edge of innovation in cost estimating and analysis techniques.

Thanks also to all of the best paper judges for taking the time out of their busy schedules to read and rate this year's papers. The job of choosing the best papers from all of the exceptional papers received this year was no easy task. The judges are broken out into teams, one for each of the five categories, and rate the papers based on technical content, creativity, usefulness in the field, and overall quality and style. The paper with the highest score is named the best in that track. All of the judges from all tracks then reviewed the best papers in each track to determine the overall winner.



### 2017 Best Paper Judges

Guenever Aldrich	Savita Choudhry	Bob Hunt	David Peeler
Richard Aldrich	Charlie Dobbs	Donovan Johnson	Josh Pepper
Tim Anderson	Tom DuPre	Arthur Kaczynski	Paolo Ponzio
William Barfield	Bob Fairbairn	Jukka Kayhko	Tom Sanders
Walter Bednarski	Cynthia Foster	William Laing	Barbara Stone-Towns
Paul Breon	Dan Galorath	Tae Lee	John Sullivan
Douglas Brown	Steve Green	Ken Marshall	Bill Taylor
Michael Brozyna	David Holm	Arlene Minkiewicz	Robyn Wiley



## 2017 Winners

Download all of the 2017 Papers and Presentations at [www.iceaaonline.com/pdx17papers](http://www.iceaaonline.com/pdx17papers)



### Analysis Methods Category -and- Best Paper Overall:

#### *Technology Development Cost and Schedule Modeling* **Chuck Alexander**

A tangible need exists in the scientific, technology, and financial communities for economic forecast models that improve new or early life-cycle technology development estimating. Industry models, research, technology datasets, modeling approaches, and key predictor variables are first examined. Analysis is then presented, leveraging a robust industry project dataset, applying technology and system-related parameters to deliver higher performing parametric cost and schedule models.

### Parametrics & Risk Category:



#### *Being Certain About Uncertainty, Part 1*

#### **Andy Prince**

Doing cost risk analysis is hard because we don't really know what a good cost risk analysis looks like. In this paper we will explore the challenges to doing good cost risk analysis and discuss ways to know if your cost risk analysis is any good. We will also examine the phenomena of extreme cost growth and lay the groundwork for future work.

### Policy & Standards Category:



#### *A History of Thought in Defense Acquisitions*

#### **Eric M. Lofgren**

As Congress debates another round of defense acquisition reform, the necessary role for the cost estimator is affirmed. But how did this role come about and what are future implications? From the famed RAND systems analyses of the 1950s to the introduction of data reporting systems still in use today, this paper will explore the rich history of thought in defense acquisition, giving a special eye to controversies and continuing challenges that affect cost estimators.

### Implementation & Operations Category:



#### *Beyond RIFT: Improved Metrics to Manage Cost and Schedule*

#### **Nicholas DeTore**

"Risk-Informed Finish Threshold" (RIFT) presented an innovative solution to the problem inherent in schedules that risk analysis results (time) cannot be allocated the same way as in cost models (dollars). Developing RIFT validation methods inspired an exploration into analyzing simulation data more meticulously. Methods described here provide unique insight into cost and schedule uncertainty results while introducing powerful new techniques to improve a project's potential to complete on time, on budget.

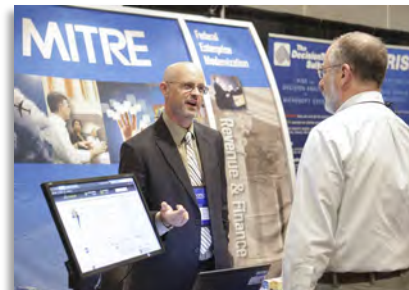
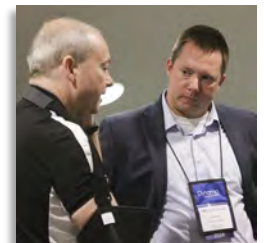
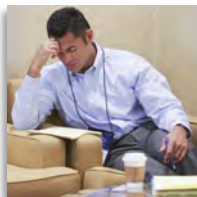
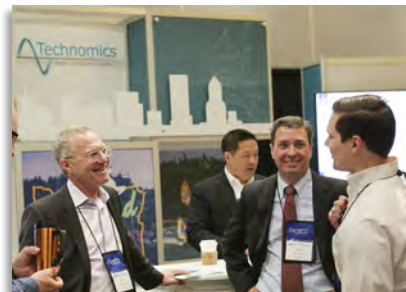
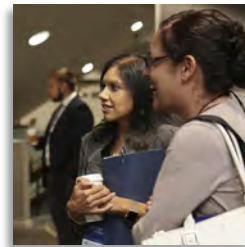
### Software & Agile Category:



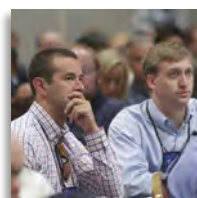
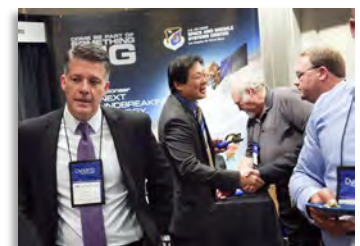
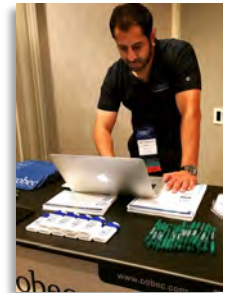
#### *Software Effort Estimation Models for Contract Cost Proposal Evaluation*

#### **Wilson Rosa, Corrine Wallshein**

This study will introduce regression models and benchmarks for predicting software development effort using input variables typically available at contract bidding phase. The analysis is based on 200 DoD projects delivered from 2004 to 2016. The first set predicts effort using initial software requirements along with peak staff, application domain, and other categorical variables. The second set predicts effort specifically for agile software development using data from 16 agile projects.











# ICEAA ASSOCIATION AWARDS

ICEAA thanks everyone who nominated one or more of their colleagues for a 2017 Association Award. The stories shared gave us unique glimpses into what makes our members the best of the best in the cost professions. As you read the summaries of their achievements below, give thought to the dedicated and inspiring members you interact with regularly and consider submitting a nomination for next year: at [www.iceaaonline.com/awards](http://www.iceaaonline.com/awards)

## Junior Analyst of the Year: Beth Hodson

Beth Hodson, Operations Research Analyst with the Air Force Life Cycle Management Center, Cost and Economics Division, Estimating Research and Technical Advising Branch (AFLCMC/FZCR) has played a vital role in the shaping of the \$30B UH-1N Recapitalization Program's Acquisition Strategy. Her brilliant Operations and Sustainment (O&S) estimating skills, coupled with her calm demeanor and ease with conveying vital information in a succinct and understandable way to even the most senior levels of Air Force acquisition leadership helped ensure a sound acquisition concept for the UH-X next generation utility helicopter program.

Beth demonstrated that O&S costs were not likely to be substantially different across the proposed concepts in the UH-X competition and therefore ought not be considered as an evaluation criterion in the determination of best value for contract award. Her impeccable knowledge of and ability to communicate those facts led to her analysis and resulting recommendations prevailing through each proposal examination.

Due to Beth's keen analysis, the UH-X program is now on the path to execute an acquisition strategy and source selection framework that will optimize best-value for the multiple using commands as well as the taxpayer.

Beth was also the O&S lead for the initial UH-1N Replacement Program Office Estimate totaling \$24B. As part of this initial estimate, Beth raised the bar for analysts across the board as it relates to standards in O&S estimating. She established entirely new cost relationships for the purposes of validating both the top-level O&S estimate result as well as numerous underlying elements. Her analysis received the highest praise from

AFLCMC cost leadership and has established Beth as the up-and-coming O&S SME for the Center. UH-1N Recap Program Leadership recognized the unique and highly desirable capabilities that Beth brought to the team and requested her continued support for an additional 12 months through the program's Milestone B decision.

At the direct request of the AFLCMC Executive Director (2-star civilian equivalent), Beth was asked to examine the service's reported CV-22 Cost per Flying Hour (CPFH). Beth broke these reported O&S costs down to their foundation and compared to other available data sources/O&S cost repositories. She then painstakingly interviewed logistics experts familiar with the program. She uncovered several minor reporting anomalies in the Air Force Total Ownership Cost (AFTOC) reporting system and identified these issues to AFTOC administrators who acknowledged the errors and made the necessary corrections to both the existing data and the data collection process, ensuring no similar errors would materialize in the future.

More importantly, Beth constructed an easy to understand story that attributed the anomalous CPFH to several unique program characteristics. Her conclusions were understood, effectively communicated, and accepted at each stage of review, earning her praise for her precise analysis and effective communication style. Most importantly, Beth ensured that AFLCMC senior leadership had a robust understanding of the program and resulting costs, facilitating their ability to make informed decisions regarding the CV-22 going forward.



Junior Analyst of the Year Beth Hodson

Beth Hodson has vastly outperformed the expectations of a junior team member, providing top-tier service and value consistent with the highest caliber GS-14 Senior Cost Analysts at AFLCMC. She is an invaluable asset to the United States Air Force whose reputation only continues to grow!

-Nominator Joe Bauer, PRICE Systems, LLC

*continued*

# ICEAA 2017 Association Award Winners

## Technical Achievement of the Year: Sanathanan Rajagopal

Since joining the UK Ministry of Defence (MOD) in 2011, Sanathanan has immersed himself in developing and ultimately sharing his knowledge about software costs, especially through his PhD study into the cost of software obsolescence. He has continually put himself forward to produce papers, undertake detailed analysis, and negotiate with and brief staff at senior level, both within the UK MOD, UK industry and overseas organisations, with confidence and credibility.



Sanathanan Rajagopal (L) with Dale Sherman (R)

As his manager for a couple of years I was hugely impressed by his dedication and determination, and his ability as someone who was then new to Defence

Acquisition to 'punch above his weight' in many aspects of the cost estimating environment he operated within. He very quickly became the focal point with the UK MOD's Cost Assurance and Analysis Services (CAAS) for many cost-estimating related matters, including use of parametric tools, to the point where he was soon shaping strategy development.

Now with QinetiQ Ltd, Sanathanan is continuing apace with his PhD, whilst further strengthening QinetiQ's cost analysis capability in the fields of cyber cost and risk analysis, as well as nurturing a growing relationship with the Australian Defence Department.

Sanathanan's other significant technical achievements include: developing an approach to help estimate the whole-life cost of software obsolescence; producing a software obsolescence cost analysis framework for project managers; developing and delivering training modules on software cost estimating for CAAS staff and masters/post-grad students at Cranfield University; developing estimating standards and also publishing many technical papers which he has also presented for the Society for Cost Analysis and Forecasting, ICEAA, and Institute of Obsolescence Management conferences.

-Nominator **John Yeaman**,  
QinetiQ Ltd

## Management Achievement of the Year: Guenever Aldrich

Guenever Aldrich is a long-time active member of ICEAA and the greater professional cost analysis community. She is currently the Department of the Navy (DON) Lead for Spectrum Relocation (SR) within the office of the DON Chief Information Officer (CIO). She provides headquarters-level oversight of all DON transition plan execution supporting the \$42B Advanced Wireless Services Three (AWS-3) auction and has spent the last two years advising the Department of Defense (DoD) joint service programs and Tiger Teams. Ms. Aldrich's ability to communicate clearly and work effectively with these different communities is just one of the many skills that make her exceptionally valuable as a cost analyst within the DON.

As the SR Lead, Guenever provides headquarters level management and oversight to the DON's SR efforts, including 12 system types, 39 transition plans, and over 50 projects. Per her colleagues, Guenever's stellar execution of the DON's \$1.5B (or 3.5%) share of the Federal Spectrum Relocation Fund "is the reason [they've] been successful to date." Mrs. Aldrich is also spearheading the development of cost estimates for future auctions which is expected to result in additional funds for the DON and for the DoD. However, the value-add of her research stretches beyond realm of appropriations to impact DON decision making processes: her 1300-1350MHz Feasibility Study will also be used to determine if a proposed Federal Aviation Administration (FAA) radar system can meet DON air surveillance and meteorology requirements within the United States.

In addition, Guenever is assessing the DoD \$500M Spectrum Access Research & Development program. Her work with the Office of the Deputy Assistant Secretary of the Navy for Unmanned Systems will ensure that technologies developed under this Federal and commercial partnership are successfully brought into the DON acquisition and technology development communities.



Kelly Fletcher (L) with Guenever Aldrich (R)

Ms. Aldrich's expertise in spectrum auctions makes her a highly valued public speaker and trainer. She has been requested for public

*continued*

# 2017 Association Award Winners ICEAA

speaking engagements by the Range Commanders Council Frequency Managers Group, the United States Navy, the United States Marine Corps Spectrum Summit, and both the United States Pacific and European Command Spectrum Summits. Guenever's commanding knowledge-base is frequently sought in the education and training of senior leadership in both the Navy and Marine Corps. Her dedication to knowledge-sharing reaches beyond work to touch all aspects of the cost community, specifically ICEAA. She has contributed to the greater cost community through speeches at ICEAA training symposiums, judging ICEAA papers, and volunteering as track chair.

Guenever maximizes the leadership skills she acquired during her military service to create a supportive and encouraging environment for military, civilian, and contract employees alike. Not only does she help her team develop the skills they need to succeed, but she ensures that their accomplishments are recognized through DON award nominations. Ms. Aldrich routinely proves herself an exceptional team-oriented leader and manager in both her role with the DON and as a member of the greater cost community.

-Nominator **Kelly Fletcher**,  
U.S. Department of the Navy

## Educator of the Year:

### Michael Thompson

Michael J. Thompson (Senior Schedule/EVM Analyst, Galorath Federal) made an outstanding educational and training contribution over the past year by advancing the skills and knowledge of cost estimating and analysis through teaching, writing, editing and publishing educational materials used to further the professional development of the Integrated Personnel and Pay System-Army (IPPS-A) government and contractor personnel. Mike developed a complete training program designed to take personnel through the complete preparation process for the integrated baseline review (IBR), a critical process in this Acquisition Category Information Management program's success. He held bi-weekly lunch sessions covering all aspects of cost, schedule, earned value, and the federal acquisition process, each complete with a set of handout materials.



Mike Thompson (center) with Brian Glauser (L) and Paul Marston (R)

Military and civilian human resource (HR) professionals are critical to the Army's mission to provide dedicated personnel and pay support to soldiers. When fully fielded, the IPPS-A will better execute the Army's HR activities by providing a single point data entry, increasing the timeliness and accuracy of soldier pay and benefits, supporting personal data update submissions and approvals, and creating a single-system for processing pay actions. This hybrid agile software development program is an Acquisition Category I Information Management Major Automated Information System acquisition program.

Mike's efforts were coordinated with and included the best practices material from Defense Acquisition University (DAU). Utilizing DAU facilities, Mike conducted government IBR team training to ready the government team members for cost account manager interviews and reinforce the evaluation process, including lectures, mock interviews, and evaluations of pre-recorded interviews.

As the largest enterprise resource management program in the U.S. Army, the IPPS-A program greatly benefited from Mike's personal educational excellence, disseminating knowledge to and mentoring new cost estimators while developing the next generation of successful cost estimators and analysts. His training helped set the IPPS-A program on a sound footing for management and success, increased exposure to ICEAA's Cost Estimating Body of Knowledge (CEBoK), and further promoted ICEAA's Cost Estimator/Analyst Certification. Mike's efforts were ground-breaking.

-Nominator **Bob Hunt**, Galorath Federal

*continued*



# ICEAA 2017 Association Award Winners

## Team Achievement of the Year:

### SPAWAR 1.6 AoA Cost Analysis Team

Led by **Min-Jung Gantt** from Space and Naval Warfare Systems Command Cost Estimating and Analysis Division (SPAWAR 1.6) and supported by cost analysts (**Brian Kadish**, **Zach Pryor**, **Andrew Onufrychuk**, and **David Todd**) from Kalman & Company, Inc.'s Business Analytics group, the team was responsible for developing the cost analysis for an Analysis of Alternatives (AoA) for the Navy's Maintenance, Repair, and Overhaul community. In this capacity, the team developed thorough Life Cycle Cost Estimates and financial evaluation metrics for numerous alternative approaches to meeting the Navy's maritime maintenance IT toolset requirement. This comprehensive cost analysis was integral to influencing the way forward for maritime maintenance capabilities, a top priority for the Navy's strategic vision.

The cost analysis challenged technical approaches and assessed their affordability. By identifying the key cost drivers and influencing the discussions in forming viable technical solutions, the SPAWAR 1.6 team was a key contributor of the AoA study. Additionally, the team modified, applied, and advanced key research related to software cost estimating published within the cost estimating and analysis community.

This team differentiated itself as a high performing and effective group through its efficient processes for communicating, implementing, and reviewing cost estimating approaches and methodologies while challenging ideas in a collaborative and constructive way. This collaboration was fostered by intellectual curiosity amongst the group, where they always looked for ways to improve upon the analysis through regular cost model development meetings. During these sessions, each component of the analysis was reviewed, scrutinized, cross checked, and adjudicated by the team with appropriate stakeholder engagement.

Ultimately, this teamwork and collaboration helped influence the direction of the AoA study in not only the cost analysis, but also the other AoA evaluation



Left to Right: **David Todd**, **Andrew Onufrychuk**, **Daniel Mask** (Nominator);  
Not pictured (**Min-Jung Gantt**,  
**Brian Kadish**, **Zach Pryor**)

components like effectiveness analysis, schedule analysis, and trade studies. The team worked closely with the other AoA team members and stakeholders to ensure a consistent analysis approach was used. As a result, the SPAWAR 1.6 team played a unique role in the AoA, influencing the Navy's strategy development through the team's comprehensive, detailed, and adaptable analysis.

Nominator **Daniel Mask**, Kalman & Company, Inc.

## Association Service Award:

### Timothy Anderson



**Tim Anderson** (L) with **Paul Marston** (R)

We enthusiastically nominated and are proud to endorse **Timothy P. Anderson** as the 2017 ICEAA Association Service Award winner. Tim has dedicated his professional career to the interests of ICEAA -- and its predecessor

organization SCEA -- making significant and sustained contributions for over 21 years.

Tim began his cost estimating career in 1995 at the Naval Center for Cost Analysis (NCCA). As he quickly gained professional experience, Tim began participating in local SCEA chapter events, as well as serving as a track chair in several SCEA conferences. He subsequently earned his CCE/A certification in 2002. After his tour at NCCA, he was assigned as a military faculty member at the Naval Postgraduate School (NPS) in Monterey CA, where he wrote a new version of the Cost Estimating course for the Operations Research department - many parts of his NPS course materials are still in use today! Tim has taught the "Engineering Economics and Cost Estimation" course for the NPS Masters in Systems Engineering curriculum since 2007, designed and annually teaches the "Risk and Uncertainty Analysis" course for the NPS Masters in Cost Estimating and Analysis (MCEA) curriculum. Over his professional and teaching career, he has taught cost estimation methods and concepts to over 1,000 students, many of whom have gone on to become professional cost estimators themselves. Throughout this time, he has consistently promoted SCEA and ICEAA membership to all of his students.

continued

# 2017 Association Award Winners ICEAA

Tim has faithfully served both the national and local SCEA and ICEAA organizations throughout his career. He served for over seven years as the Program Chair for the Washington Capital Area Chapter of SCEA and ICEAA, coordinating monthly luncheons and recruiting speakers for the benefit of the chapter members, and currently serves as the chapter's vice president. Moreover, he was the impetus behind the development of the Washington chapter's "Speaker of the Year" award, which is now awarded each year to the most effective luncheon speaker. Tim has also participated in nearly every SCEA and ICEAA conference since 1995: as a track chair, on the awards committee, as an instructor in the training track and presented numerous papers, moderator in panel discussions, as certification exam proctor-- and there are probably a few other tasks that we are missing! He also served on the ICEAA International board as the chair of the Governance Committee at a crucial time after the SCEA/ISPA merger, making substantial improvements to the ICEAA constitution and bylaws. Tim has written two articles for the National Estimator publication on how to work with Learning Curves and is a member of the Cost Estimating Body of Knowledge (CEBoK) Update Task Force, responsible for revising and renewing ICEAA's curriculum.

Tim's contributions to the association over the last 21 years have been frequent, substantial, and sustained. He has faithfully maintained his CCE/A certification since 2002, and the association can always count on him to take on the difficult roles that make ICEAA effective. We cannot think of anyone who has contributed more consistently to the International Cost Estimating and Analysis Association than Tim has. He has our strongest recommendation for this award!

.-Nominators **Daniel Nussbaum** and **Gregory Mislick**,  
Naval Postgraduate School

## Frank Freiman Lifetime Achievement Award: Bruce Fad

**Bruce Fad**, PRICE Systems, LLC's Vice President for Operations and Engineering, received the ICEAA 2017 Frank Freiman Lifetime Achievement Award for his consummate contributions to cost estimating and analysis.

First presented in 1983 and awarded 33 times since, this legacy International Society of Parametric Analysis (ISPA) award recognizes lifetime achievements with an emphasis

on parametric cost estimating. Frank Freiman was acknowledged "the father of modern parametrics" for his pioneering achievements, as Director of RCA PRICE Systems, in the development and application of general purpose cost estimating models. Frank also played a major role in the creation ISPA in 1979 and was named its sole Honorary Director.

Bruce served as Chief Parametric Cost Analyst for the National Security Agency from 1975-1979, moving to RCA PRICE Systems about the time that ISPA was formed. There, he served as liaison with the Defense Contract Audit Agency and industry on parametric auditing issues.



*Bruce Fad (L) with Hank Apgar (R)*

In his 37 years with PRICE Systems, Bruce has trained and mentored more than 3,000 parametric estimators worldwide. He consults with clients in Europe, Asia, and the US; he introduced parametrics to estimators in Korea and China. He holds patents for cost modeling with applications to hardware and software, and has served as a tax court expert witness on software asset valuation.

Bruce's knowledge extends beyond the mechanics of cost modeling. As evidenced by his many presentations and journal articles for ICEAA and its legacy organizations (SCEA, ICA, and ISPA), he is a master at framing the estimate to fit the needs of the decision maker. He has consulted on numerous publications including the "GAO Cost Estimating and Assessment Guide," and his 1988 book, "Parametric Estimating for New Business Ventures" is popular world-wide.

Only when one fully understands the discipline and heritage of a subject can he apply satire to explain its intricacies. Consider Bruce's ICEAA paper, "Ten Dumb Statements on Estimating, Confessions of a Cost Lifer" where he refutes familiar excuses as: "but, that's what the model says" and "your estimate won't be any good if you base it on history because we intend to do this job differently."

Thank you, Bruce, for training and mentoring us along the way...with a touch of humor to make it fun.

.-Nominator **Hank Apgar**, MCR, LLC.

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## International Cost Estimating & Analysis Association

### Professional Development & Training Workshop

June 12-15, 2018

Phoenix Renaissance Downtown ❖ Phoenix, Arizona

There's no time like right after an outstanding workshop to start thinking about the next one! Portland was cool, but Phoenix is gonna be **hot!**

We're already hard at work incorporating your suggestions into next year's program, reaching out to keynote speakers, and conjuring up new and interesting ways to keep the workshop experience fresh.

The 2018 Workshop team aren't the only ones who should start planning for next year: deadlines for abstracts, notification, best paper entry and presentation drafts will be about the same as they were for 2017, which means the deadlines will be here before you know it.

Earlybirds will also enjoy a worm worth \$100 off registration rates if they register before May 1, 2018. Making your hotel reservation early is the best way to ensure the convenience of your private room being only an elevator ride



away from the sessions, and to secure your room at the ICEAA rate of \$169 per night. The Renaissance Phoenix Downtown has granted us a generous number of rooms at the 2018 government per diem rate, but they will go

quickly - govies should plan to book by March to get the government rate.

Our host hotel is in the heart of the Copper Square neighborhood, pulsing with live music venues, hip new restaurants, and a vibrant art scene. When the sun goes down, a short stroll in the cool desert evening gets you to everything you could want to unwind after a day of Workshopping. For those planning to spend a few days in the area before or after the workshop, day trips abound within an hour's drive to Sedona, the Grand Canyon, and more.

Keep your eyes on your inboxes for announcements, reminders, and deadlines!

#### Professional Papers Deadlines:

December 4, 2017: Abstract summaries and bios due

January 22, 2018: Accepted authors notified

March 30, 2018: Papers due for Best Paper Award consideration; draft presentations due for track chair review and feedback

#### Training Modules Deadlines:

December 11, 2017: Requests to provide training due

January 29, 2018: Selected trainers notified

March 5, 2018: Training brief abstracts, presentations and trainer bios due

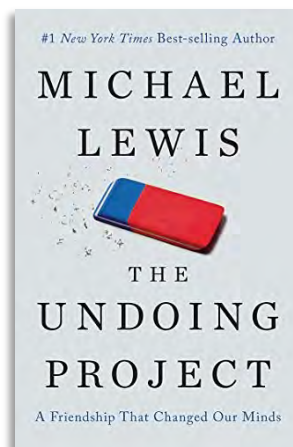
# Money Changes Hands... ...A Good Book Changes Minds

## Book review by Col David Peeler

In what might be considered a prequel to the book *Moneyball*, this edition's selection is really more of an intellectual precursor. Rather than tell what precipitated the baseball events and decision calculus implemented by the Oakland A's baseball team, Michael Lewis turns to the theoretical shift in thinking that took place in the decades prior to the emergence of decision analysis in baseball. As the subtitle posits, the book chronicles the collaborative friendship of two psychologists and how they altered rational man theory to change minds.

For sports fans, the book opens with a tantalizing focus on questions and attempts to quantify talent identification and analytical projections of success in the National Basketball Association. It's a treatment for basketball as *Moneyball* was for baseball. Ultimately, Michael Lewis makes the court much broader in *The Undoing Project* by addressing decision-making *writ large* and chronicling the collaboration of two psychologists whose work changed the view of economic rational man theory. It was a change with consequences for our chosen profession, which depends greatly on the economist's historical view of markets and human activity within them. After introducing the two psychologists and relating their tie to the creation of Israel, the bulk of the book turns to the inspired results of their persistent questioning. Beyond geopolitical interest, Lewis shows how Daniel Kahneman and Amos Tversky, as Israeli Jews, interpreted their experiences and used those influences to see inconsistencies between rational man theory and the real, everyday seemingly irrational decisions made by all kinds of people.

Throughout the story of Kahneman's and Tversky's work are spread interesting questions regard decision-maker behavior. The first to capture the attention of this reader occurred early, when Lewis addressed all the areas influenced by the material in *Moneyball*. Why had all the compiled conventional wisdom of activity, not just of baseball scouts, been hokum? "Why had so many industries been ripe for disruption? Why was there so much to be undone?" If so many activities in both society and business could apply what Billy Beane did for the Oakland A's, what had we been doing wrong before? Of interest to cost estimators is another question of the psychological research, "How does the brain create meaning? How does it turn the fragments collected by the senses into a coherent picture of reality?" When thinking about analogies, "What goes on in the mind when it



evaluates how much one thing is like, or not like, another?" How far does likeness go? Is what we think we perceive applicable to our program or its estimate? In a noticeable application to innovation in the current market and government environments, the psychologists confirmed Irv Biederman's sense that "most advances in science come not from eureka moments but from 'hmmm, that's funny.'"

Kahneman and Tversky "believed that they could use their understanding of the systematic errors in people's judgement to improve that judgement – and, thus, to improve people's decision making." They thought they were about to conquer the world. Unfortunately, as Lewis lays out in the next hundred pages or so, their continued research and experiments revealed rational decision-making as much less evident than previously expected and that learning was negligible. Even when the odds of a gamble, read risk, were clearly laid out in a problem, decision-makers consistently made the wrong decision vis-à-vis the economist's rational man. Thus jumps out a final point that makes one truly reflective. Is it possible that, "Reality is a cloud of possibility, not a point." For a cost estimator this idea isn't much of a logical

leap, given our work and challenges to steer folks away from the point estimate.

An enticing read, with its concepts and meaning woven nicely within the story of two unlikely friends that collaborated to change the way we think about thinking. Much to be gleaned by cost estimators, as we relate to the issues of perception, risk, and people's decision-making prowess. The only thing expected that wasn't there was closure with some mention to the nature of basketball forecasting. Relating it back to the opening could have been instructive.



Colonel Peeler serves as Deputy Director, Financial Management and Comptroller for the Air Force Life Cycle Management Center. He is a certified cost estimator/analyst and an Air Force certified acquisition professional in both financial and program management. He is a member of both the American Society of Military Comptrollers and the International Cost Estimating and Analysis Association.

Book Review

# ertification ongratulations

Our certified members have been very busy this spring and summer, with nearly 40 submitting their recertification paperwork in just a few short months! The majority of those who recertified between March and July of this year are in the certification class of 2012. Way to go Class of 2012!

Recertification without re-testing is easy through active involvement in the cost community, and through the many opportunities ICEAA provides to earn recertification points. Points are awarded for supporting your local chapter, offering training events at your company or for the public, or proctoring the exam. ICEAA's annual Professional Development & Training Workshop offers several opportunities to earn points beyond simply attending sessions, from track chairing to best paper judging .

Active involvement with ICEAA makes accumulating recertification points easy, and serves

as a great reminder and motivation to on stay top of your own personal achievements, professional development, and furthering your career path.

Please contact the ICEAA International Business Office if you have questions about certification or the recertification process. We're here to help you succeed!

Speaking of earning points for proctoring the certification exam, below are those who have volunteered their time to proctor exams nationally and internationally between March and June 2017. These individuals have an appreciation for the value of certification and are eager to afford others in the field the opportunity of putting themselves a step above the rest with the certification credential:

**Dana Beaumont, Gina Fenell, Paul Gardner, Jeremy Goucher, Diane Heckert, David Hertz, Richard Hoffacker, Chen Hu, April Huan Li, Andrew Jones, Justin Knowles, Patrick Myers, and Cari Pullen.**

The following recertified between March 2017 and July 2017

<b>Randall Aldrich</b>	<b>Garrett Filemry</b>	<b>William Lueker</b>	<b>Michael Shortell</b>
<b>Timothy Anderson</b>	<b>Jeremy Fulwiler</b>	<b>Ted Mills</b>	<b>Joanne Smith</b>
<b>Leslie Bacon</b>	<b>James Glenn</b>	<b>Sheila Nicholson</b>	<b>Christina Snyder</b>
<b>Nitin Bangera</b>	<b>Townsend (Kemp) Hanafourde</b>	<b>Paul Ostrowski</b>	<b>John Sullivan</b>
<b>Joseph Bauer</b>	<b>Mark Johnson</b>	<b>James Pratt</b>	<b>Matthew Tetreault</b>
<b>James Black</b>	<b>Jennifer Kirchhoffer</b>	<b>Andy Prince</b>	<b>Charles Thompson</b>
<b>David S. Brown</b>	<b>Kerry Kou</b>	<b>Zachary Pryor</b>	<b>Raymond Wekluk</b>
<b>Diane Butler</b>	<b>Mitch Lasky</b>	<b>Raymond Radovich</b>	<b>Elizabeth White</b>
<b>John Dubelko</b>	<b>Paul Linseisen</b>	<b>Shamraz Razzaq</b>	<b>Larry Winterton</b>
<b>Andrew Eysers</b>		<b>Kenneth Rhodes</b>	



## **PCEA® Achievers:**

**Michael Brown**, United States Air Force  
**Ian Cordell**, United States Air Force  
**Cory D'Amico**, United States Air Force  
**Lance Echternach**, Jeppesen/Boeing  
**Samuel Guidry**, Booz Allen Hamilton  
**Joseph Kenvyn**, BMT Hi-Q Sigma  
**James Northington**, Tecolote Research, Inc.  
**Aaron Rhea**, United States Air Force  
**Steve Robertson**, BCF Solutions  
**John Rosson**, United States Air Force

## **PCEA® Achievers/CCEA® Eligible:**

**Hazel Atkins**, BMT Asset Performance Ltd.  
**Geoffrey Boals**,  
Defense Information Systems Agency  
**Kevin Dwyer**, United States Air Force  
**Michael Horak**, Technomics, Inc.  
**Cassandra Hull**,  
Department of National Defence, Canada  
**Joseph Javier**, Booz Allen Hamilton  
**Pressilia Jelatian**,  
Department of National Defence, Canada  
**Thomas Lamb**, United States Air Force  
**Barry Niemann**,  
Department of Defense, Canada  
**Cai Ningjia**,  
Department of National Defence, Canada  
**Melissa Ricco**,  
Department of National Defence, Canada  
**Maya Ward**, Booz Allen Hamilton

## **CCEA® Achievers:**

**John Bowers**, Tecolote Research Inc.  
**Timothy Damazyn**, The Boeing Company  
**Nathaniel Davis**,  
Department of National Defence, Canada  
**Peter DeBois**, United States Air Force  
**Dominic McCaskill**, BMT Hi-Q Sigma  
**Curtis Graver**, Tecolote Research, Inc.  
**Arthur Grijalva**, Tecolote Research, Inc.  
**Matthew Halbrook**,  
Huntington Ingalls Industries  
**Keith Hallisey**,  
Department of National Defence, Canada  
**Peter Hansen**, Deloitte  
**Brittany Holmes**, CSRA  
**Carm Iraci**,  
Department of National Defence, Canada  
**Gregory Lindvay**, Tecolote Research Inc.  
**Brandon Lucas**, United States Air Force  
**Adam Marcal**, Tecolote Research, Inc.  
**Benjamin Netherland**, MCR, LLC  
**Monique Ng**,  
Treasury Board Secretariat, Canada  
**Travis Packard**,  
Huntington Ingalls Industries  
**Chris Schane**, Tecolote Research, Inc.  
**Diane Schultz**, United States Air Force  
**Amy Smith**, BAE Systems - Australia  
**Brittany Staley**, Herren Associates  
**Madeleine Teller**, Tecolote Research, Inc.  
**Corinne Wentworth**, Tecolote Research, Inc.  
**Emily Winfield**, Tecolote Research, Inc.  
**Michael Wismer**,  
Department of National Defence, Canada  
**Ivy Yang**,  
Department of National Defence, Canada

# Measuring the Increasing Relevance of Cost Estimating through Text Analytics

Capt. Gregory E. Brown, USAF

If you are a Department of Defense (DoD) cost estimator, you have probably heard a fellow estimator make a claim similar to this one:

*Cost estimating is increasingly relevant in the post-sequestration era of growing requirements, shrinking budgets, and overall cost consciousness.*

But would those outside the field of cost estimating agree with the above statement? Or are we—cost estimators—inflating our own importance? And more importantly, what is the perception among government decision makers? For example, if we surveyed decision makers—such as members of Congress—would they support the notion that cost estimating has become more relevant to the DoD over time?

**Hypothesis.** While it is not reasonable to collectively survey the members of Congress, it is possible to analyze their public writings. Text analytics is therefore applied to the National Defense Authorization Act (NDAA), a federal law drafted annually by Congress specifying the fiscal year budget for the U.S. Department of Defense<sup>1</sup>. Through text analytics, this author utilizes the NDAA as a proxy for measuring the perceived relevance of cost estimating over a 20 year period. It is hypothesized that if government decision makers perceive cost estimating as increasingly relevant to the DoD, then consequently, terms related to cost estimating should appear with greater frequency over time.

**Methodology.** So how does one begin to measure cost estimating terminology? First, applicable search terms must be identified. Although there are many possible words used to describe cost estimating, it is practical to focus on a few search terms that are unique to cost estimating and unlikely to cause false positives. The search terms “cost estimat”, “cost analys”, and “cost assess” are subjectively identified, and summarized below. Next, preprocessing of the NDAA text is required. Each fiscal year’s NDAA is converted to a lowercase, plain text file which is machine-searchable. Lastly, the text analysis is conducted. Using a statistical software package, the frequency of each identified search term is counted by fiscal year and then plotted.

## Search Terms

## Possible Natural Language Matches

**cost estimat** cost estimate, cost estimates, cost estimator, cost estimators

**cost analys** cost analysis, cost analysis improvement group, cost analyses, cost analyst

**cost assess** cost assessment, cost assessment and program evaluation

*continued*

**Results.** Prior to fiscal year 2005, Congress included minimal cost estimating terminology in the NDAA. However, since 2005, there has been a steady increase in cost estimating terms, as seen graphically in Figure 1. Excluding the overly influential data point of 2014, a simple linear model indicates that each fiscal year after 2005 has an average year-over-year growth of about 4 cost estimating terms. This evidence supports the supposition that cost estimating has become increasingly relevant to the DoD over the last 20 years.

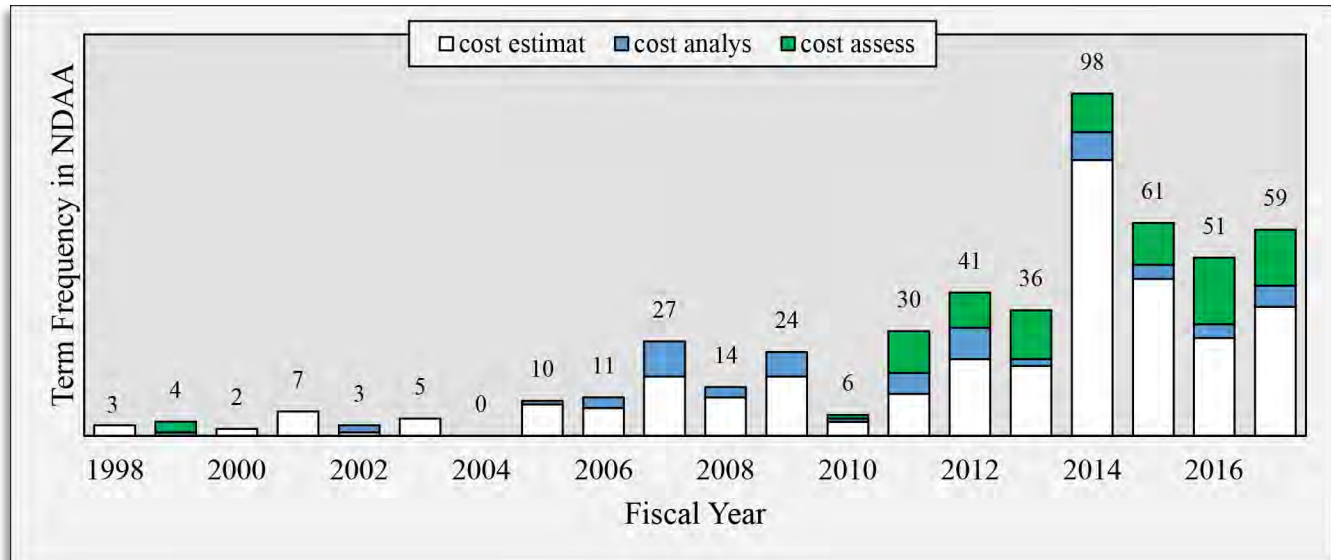


Figure 1: Frequency of Cost Estimating Terms in the NDAA (Fiscal Years 1998 – 2017)

## What is Text Analytics?

*Text analytics*—also known as text mining—can be described as a set of techniques for turning unstructured, qualitative text into usable data. In its unstructured form, text is descriptive, and cannot be measured with numbers. Business reports, research papers, e-mails, and social media posts are all examples of unstructured text. Using text analytics, however, it is possible to extract structured data, such as the identification of patterns, correlations between words, or the frequency of words within a text<sup>2</sup>.

If you are new to data analytics, you may be particularly skeptical of text analytics. However, text analytics has already been applied in cost estimating research, and thus there is a very real possibility that text analytics may contribute to cost estimates in the future. Consider that:

- Using text analytics, Miller examined the written portion of Contractor Performance Reports, finding that the frequency of specific keywords is predictive of cost growth, six months before the growth occurs<sup>3</sup>
- Using text analytics, Algarín analyzed planning documentation for major acquisition programs, discovering that an increased percentage of words related to human systems engineering is correlated with a decreased probability of future cost growth<sup>4</sup>

<sup>1</sup>Committee on Armed Services. (n.d.). *National Defense Authorization Act*. <https://armedservices.house.gov/hearings-and-legislation/ndaa-national-defense-authorization-act>

<sup>2</sup>Prato, S. (2013, April). *What is Text Mining?* Syracuse University. <https://ischool.syr.edu/infospace/2013/04/23/what-is-text-mining/>

<sup>3</sup>Miller, T. P. (2012). *Acquisition Program Problem Detection Using Text Mining Methods* (Master's thesis, Air Force Institute of Technology, 2012). Wright-Patterson AFB, OH.

<sup>4</sup>Algarín, L. (2016). *Human Systems Engineering and Program Success—A Retrospective Content Analysis*. *Defense Acquisition Research Journal*, 23(1), 78-101.

Captain Brown serves as the Chief of Cost Analysis for the Special Operations Forces & Personnel Recovery Division, Air Force Life Cycle Management Center. He is a professional cost estimator/analyst and an alumnus of the Air Force Institute of Technology Graduate Cost Analysis (GCA) program.



## Washington Capital Area Chapter Report

By Meghan Kennedy, ICEAA Washington Capital Area Chapter President

### Chapter Elections

The Washington Capital Area Chapter will hold an election for its 2017-2019 Board of Directors September 15-29. An email with the initial slate of candidates and information regarding seeking nomination by petition will go out no later than September 1st.

### DC Chapter Service and Social Events

The chapter plans a soup kitchen service event in the Fall, as well as laying wreaths at Arlington National Cemetery in December. We are also hoping to hold a beer business talk in conjunction with happy hour at one of the local breweries. Watch your email for details on these events!

### DC Chapter Board Member Receives Award

**Tim Anderson**, the Washington Capital Area Chapter Vice President, was presented with the Association Service Award at the 2017 ICEAA Workshop in Portland, OR. Tim served as the chapter's Program Chair for over seven years before moving on to his current position on the board. In addition to his invaluable role at the chapter level, he has served as track chair, on awards committees, as an instructor and presenter, exam proctor, and panel moderator at the SCEA and ICEAA workshops. Finally, Tim is a leader in the cost community as a teacher. From his work at the Naval Postgraduate School, developing the curriculum and teaching over 1,000 students, to

serving on the Cost Estimating Body of Knowledge (CEBoK) Update Task Force, he has helped to improve the knowledge of countless others. Congrats to Tim on a much deserved award!

### Monthly Presentations


The chapter continues to offer a popular monthly lunchtime speaker series. Some of our recent presentations include:

March 2017: *Failure to Reason: Intuition and Decision Making Under Uncertainty*, presented by Capt **Chris Thomas** of AFCAA. Held at Herren Associates, Inc., Washington, DC.

April 2017: *Bottom Up Methods of Estimating Software SEPM and Non-DCTI Costs*, presented by **James "Jay" Black** of HHS. Held at TMB, Inc., Washington, DC.

May 2017: *Modeling with Gumbly: Pros and Cons of the Weibull Curve*, presented by **Jake Mender** and **Anne Hawpe** of NCCA. Held at Presidential Towers, Arlington, VA.

July 2017: *DHS Cost Analysis Overview*, presented by **Katie Geier Noriega** of DHS. Held at MITRE, McLean, VA.

If you're interested in presenting at one of our luncheons, please contact our program chair at [ProgramChair@washingtoneaa.com](mailto:ProgramChair@washingtoneaa.com). 

## CAN YOU ANSWER THIS QUESTION?

Which of the following is **not** a purpose of the Work Breakdown Structure?

- A. To provide a lower level breakout of small tasks that are easy to identify, staff, schedule, and estimate
- B. To identify the organizational relationships and assign work responsibilities
- C. To reduce the possibility of overlap, duplication, or redundancy of tasks
- D. To provide a basis of comparison for the actual work completed versus the estimate
- E. To furnish a convenient hierarchical structure for the accumulation of resources estimates

ANSWER ON THE NEXT PAGE


## Central Virginia Chapter Report

*By Thomas Knoll, ICEAA Central Virginia Chapter President*

The Central Virginia Chapter hosted a luncheon on site at Naval Surface Warfare Center Dahlgren Division for the third meeting of the current term on May 18th. Those in attendance were able to enjoy lunch from Jersey Mike's while listening to briefs from local chapter members. **Tom Schaefer** from Tecolote Research presented a brief summarizing his interesting findings from a GAO Assessment of ACAT II & III Programs. Later, **Jeremy Goucher** and **Brittany Staley**, both of Herren Associates, gave the chapter an early showing of their 2017 ICEAA Portland Workshop paper submittal, *Reliable CERs for Software Cost Estimating*. The chapter is very grateful to these presenters and previous presenters from this year including **Dr. Jonathan Brown** from Naval Surface Warfare Center Dahlgren Division - Department V11, who also represented the Central VA Chapter by presenting a paper at this year's ICEAA 2017 Workshop in Portland, and **Yun Kim** from Tecolote Research.



*Dr. Jonathan Brown presents for the Central VA Chapter*

In other chapter news, several members have expressed interest in pursuing the Certification for Parametric Methods (CCEA-P) designation that is newly available. The chapter plans to hold the fourth and final meeting of the current term in early September in which those in attendance at the 2017 Portland Workshop will share lessons learned with the remainder of the chapter. Also, the chapter will announce chapter award winners, for the first time since chapter inception, during the September meeting as will the newly elected chapter board also be announced at the meeting in September. Nominations and elections of chapter board members are expected to take place over the coming months. 

### ICEAA Central Virginia Chapter 2016-2017 Board of Directors:

President	<b>Thomas Knoll</b> tknoll@tecolote.com
Vice President	<b>Robert Watts</b> rwatts@tecolote.com
Treasurer	<b>Geoffrey Driskell</b> geoffrey.driskell@navy.mil
Secretary	<b>Brittany Staley</b> brittany.staley@jlha.com
Membership	<b>Maureen Deane</b> mdeane@tecolote.com

ANSWER: B All of the responses indicate a purpose of the WBS except response B, which describes the Organizational Breakdown Structure.

## DID YOU GET IT RIGHT?

If you are **NOT** certified and answered **RIGHT**, then...

...take the CCEA® Exam to gain a professional certification

If you **ARE** certified and answered **RIGHT**, then...

...present, publish, or provide new questions for the exam

If you are **NOT** certified and answered **WRONG**, then...

...take the training offered at this workshop and/or your local chapter

If you **ARE** certified and answered **WRONG**, then...

...keep active with ICEAA to gain recertification points



## Society for Cost Analysis & Forecasting (SCAF): Costing News from the UK

*by Dale Shermon, SCAF Chairman*

**P**artnering seems to be the buzz word at the present time in the UK. Clients are seeking tenders from a partnership rather than from a single source supplier. This is an interesting trend with suppliers seeking to cooperate with each other and seek partners who complement their in-house capability in order to maximise their offering. It would seem that clients want to be able to explore a breadth of services and solutions through a single contract which is seen to be possible from a partnership rather than from a single supplier. From the suppliers perspective this becomes an interesting exercise to secure strategic teaming relationships before competitors form a partnership. When multiple simultaneous tenders are being produced it is possible for one part of an organisation to be partnering with a company with whom it is competing for another tender elsewhere within the business!

In April, SCAF had our annual challenge, this year provided by **Sanathanan Rajagopal**, to cost a software app. SCAF had more than seven teams who applied but Atkins, Thales, BAE System, CAAS, FFI, Cranfield University, and Babcock were successful when drawn from a hat. The organisations provided very capable junior members of their businesses to attempt the cost estimate and present it to a panel of experts. It was again a very stimulating and inspiring day.

I was fortunate to attend and present at the ICEAA Conference at Ottawa on May 1 and 2. With more than 170 attendees for two days, the Canadian conference had grown again this year. As SCAF Chairman, I participated in a panel session with **Dan Galorath**, **Zach Jasnoff** and **Rick Collins** regarding the *Foundations For A Cost Estimating Organization*.



*Participants in the annual SCAF challenge:  
costing a software app*



*A Shermon's Eye View of the panel and panelists*

During the discussion, I included reference to SCAF and the opportunities our societies provide to network and learn from each other.

In June, I spent a few weeks in Canberra working with my QinetiQ Australian colleagues in the Department of Defence. Between data gathering and interesting discussions on parametric cost estimating and cost estimating relationships, I took the opportunity to visit the Royal Australian Mint. As a cost engineer, this was a logical destination; a free visit, around an engineering complex, that was pressing out coins. Unfortunately, there were no free samples!

Back in the UK, the SCAF committee has been approached by the Single Source Regulatory Office (SSRO) and National Audit Office (NAO) for our support. The SSRO is looking for insight with regards to risk in single source contracts while the NAO is seeking help with costing of major infrastructure and equipment projects. The SCAF committee is still exploring the requirements, but as a cost community in the UK it is great to be recognised as a society that can support and influence new initiatives.



*Selfie!*

Our next SCAF event will be our conference on the theme of *"Beyond contract negotiation: Partnering and Emerging Challenges"* at the QEII Centre in London on the 12<sup>th</sup> of September. Our next workshop will be a *"Vender and Services day"* on November 14<sup>th</sup> at the BAWA Centre, Filton, Bristol. We will have the opportunity to meet tool providers and consultants from our cost community who will be showing case studies. If you are in the UK or nearby, come and join us, to learn something new or contribute to the learning of the less experienced by networking!





29th Annual International Integrated Program Management Workshop

# IPMW 2017

*The premiere workshop on earned value management*

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**[www.ipmworkshop.org](http://www.ipmworkshop.org)**

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CCEA® holders are required to accumulate at least 30 recertification points  
across three areas of involvement during a five- year period

### PROFESSIONAL WORK EXPERIENCE

EARN UP TO 15  
POINTS FOR:  
EMPLOYMENT IN A  
COST-RELATED  
PROFESSION  
SERVING IN A  
COST ANALYSIS ROLE  
CREATING  
COST ANALYSIS  
PRODUCTS

### PARTICIPATION AND CONTRIBUTION

EARN UP TO 15  
POINTS FOR:  
MEMBERSHIP IN COST  
ORGANIZATIONS  
SERVING IN A  
LEADERSHIP POSITION  
RECEIVING AN  
AWARD, CITATION,  
COMMENDATION

### LEARNING AND SHARING

EARN UP TO 15  
POINTS FOR:  
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COST-RELATED  
COURSES, SEMINARS,  
WORKSHOPS, ETC.  
TEACHING,  
PUBLISHING,  
PRESENTING ON  
COST TOPICS

visit [www.iceaaonline.com/certification-matters](http://www.iceaaonline.com/certification-matters) for more information