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OUTSIDE THE BOX

THE UNEXPECTED BENEFIT OF CELEBRATING FAILURE

CLICK to watch Astro Teller talk about “The Unexpected Benefit of Celebrating Failure” presented by TED.

The head of X (formerly Google X), takes us inside the "moonshot factory," where his team seeks to solve the world’s biggest problems through experimental projects like balloon-powered Internet and wind turbines that sail through the air. Find out X’s secret to creating an organization where people feel comfortable working on big, risky projects and exploring audacious ideas.

Astro Teller oversees X, Alphabet’s moonshot factory for building magical, audacious ideas that can solve concrete problems for millions of people through science and technology. As X’s head, Teller has an unmatched vantage point from which to watch possible futures unfold. In addition to his day job shepherding Peter Pans with PhDs, Teller is on the board of several businesses including AI-based hedge fund Cerebellum Capital, Inc., and Flux.io, a startup reinventing how buildings are designed and built.

Outside the Box will be a standing column designed to introduce new ideas and concepts from other resources and professions that may help stimulate a new way of thinking about total cost management. The views and opinions expressed are those of the authors and do not necessarily reflect the official policy or position of AACE International. We invite Source readers to send suggestions on other sources to editor@aacei.org.
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As I start my year as your President, AACE is at an exciting and crucial point in our history. We are 60 years old, a tremendous accomplishment in the face of the whole-sale changes in our profession that have occurred since we were founded by O.T. Zimmerman and 58 other visionaries on June 2, 1956. We should celebrate our past, as we did then with a fabulous “costume party” at the Annual Meeting, and look forward to the future that holds great possibilities and great challenges. Perhaps the most significant opportunity before us is the redefinition of our public image and name that will allow us to develop a more vibrant face for our educational offerings on the world-wide web and to tap into the vast number of professionals all over the globe who can benefit from our state of the art technical expertise. Our work as cost engineers, estimators, project control specialists, risk managers, schedulers, and claims experts has never been more needed. That need is self-evident in developing infrastructure in a sensible and realistic manner. We, by necessity, are on the cutting edge of all this work. AACE is equipped to assist you to move forward.

My goal as President is to help you do your job better through your engagement with AACE. Our primary implementation tools are our three Associate Boards, each of which is led by a hard-working dedicated group of volunteers and staff. Our Technical Board is relentless in developing and maintaining our world class technical content – our recent Annual Meeting in Toronto was built around that content. Our best-in-class certification programs, developed and maintained by our Certification Board, is in the business of assuring that our certificate holders are recognized as having the highest levels of professional expertise. And all of this great knowledge that is developed by the Technical Board and tested by the Certification Board is available for education and training through the programs developed and maintained by the Education Board.

AACE’s Strategic Plan (which is available for review on our website) is the cornerstone of our plans for the future. As our past AACE presidents have stated frequently in this column, our Strategic Plan is essential for our near-term and long-term future. The Strategic Plan is a living document that is overhauled every few years and adjusted yearly as required.

We need this plan for the future because we have significant challenges in the present. One of those challenges is that AACE is not as well recognized as it needs to be. Many potential professionals and potential members know little about us because they have not heard of us or misperceive the range and depth of our offerings. AACE has expanded beyond a membership of cost estimators and cost control analysts into a full suite of related professions, including project control experts, managers, schedulers and planners, risk analysts and claims consultants, as well as significantly more sophisticated cost estimating and cost control professionals. The challenge of developing a plan for AACE to respond to this expanded group of professions has been assigned to the Vision 20/20 Task force, created from a Strategic Plan objective. This task force group has conducted internal and external
workshops (there were several at the Annual Meeting) and issued a detailed survey (we got a great response) that reflected significant pluralism in our objectives and expectations. They are now finalizing a set of recommendations that the Board of Directors and you, the membership, will review and approve. We need this in-depth review of ourselves so that the AACE can stay relevant to our current and future members.

Another important initiative AACE leadership will focus on is a continuation of efforts started several years ago that bore tangible fruit this year. Under the direction of the Education Board, we have developed the first of an eventual entire curriculum of on-line educational offerings. Our intent is no less than developing a set of modules that will cover a significant portion of our intellectual property and make it more available to our members, prospective members, and the industry. The first of these modules is in testing now and is expected to be available to the public toward the end of the year. This is challenging for many reasons, but the biggest challenge is the revolution occurring in educational delivery brought about by the internet and changes in how the Millennial Generation prefers to learn. In the next few years we will continue to roll out state-of-the-art online education and training modules that will allow our members to take AACE courses when and where they choose, using a variety of delivery platforms.

Another essential element of the Strategic Plan is the recognition that our public face – www.aacei.org, needs to be significantly upgraded to improve the users’ experience, whether the users wants to join AACE, take a course, find a technical paper, or pay their dues. The new website will be available this year – and we can’t wait.

These initiatives, and others; including changes to our internal management software, the role of newer members in our organization, the appropriateness for language translation of our core products as we expand internationally, and our relationship to regional AACE symposiums, will all have a profound impact on your AACE. All these projects and others will continue this year with the over-arching understanding that AACE International is a world-wide organization that must embrace different cultures, languages, and patterns of professional development. With over 8,500 members, our membership has grown by nearly 50 percent since 2006. We must continue to grow both broader and deeper.

Over the course of our past six decades, this organization has faced great challenges and survived them well. However, we cannot rest on our laurels. We live in a world in which information and communication technologies are constantly evolving and creating new kinds of interaction and new behaviors. Now, as it was at our founding, our members continue to be the center of what drives us to pursue innovations that will impact our business models, enhance service platforms, and develop new content delivery mechanisms. We want to be an indispensable resource to our members, not just relevant, but essential.

Our Board of Directors, associate boards, committees, section leaders, and staff are all working together to make the AACE what it can and should be. However, we cannot do it alone. Volunteer involvement in strategy, projects, and activities is critical to our standard of quality. There are many ways to get involved as a volunteer. For those of you concerned about time commitment, our micro-volunteering program allows for virtual, easy, and low commitment activities. Some activities can be performed on your schedule and where you would like to undertake them.

We still have many opportunities as an organization. I look forward to those opportunities and commit to leading this organization to the best of my ability. I invite you to work with me. Together we can preserve our AACE heritage and, at the same time, guide the next generation of our profession. Our world is changing, and if we work together, we can contribute to its technical achievement.

If you would like to contact our current president with questions or comments about The President’s Message please address your e-mail to president@aacei.org. To engage in other discussions, check out AACE International’s Online Forums at www.aacei.org/forums.
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Submit your paper by January 31, 2017
Submit your presentation slides by March 31, 2017

www.aacei.org
Christopher P. Caddell, PE CCP DRMP, Director-Region 5, likes everything about AACE International. In 1998, his manager suggested they write a technical paper together, related to the project Caddell was working on. The manager suggested that AACE would be the perfect place to submit the paper to and hopefully have an opportunity to present it at the AACE Annual Meeting. Caddell says he became a member of AACE in 1999, the same year he presented his first technical paper at an AACE Annual Meeting.

Upon becoming an AACE member, he started learning about AACE certification. He says, “For my Certified Cost Professional (CCP) certification, I knew of no other certification that truly represented what we do as cost engineers and held the prestige I was looking for.” More recently, AACE added a Decision and Risk Management Professional (DRMP) certification. This one holds a special place with Chris. He explains, “For my DRMP, I was fortunate enough to be asked to be a part of the task force to help define the certification program. I felt so honored to work with such great people in developing it. That certification to me represents the effort we put into that program.”

As noted, Caddell appreciates all things AACE. Commenting on promoting the association, he says, “I really appreciate the products and the people. AACE offers some of the best products to help define all facets of cost engineering. AACE members represent both the tops in this field and its future. I just enjoy spending time with them, both networking and debating our practice.”

Asked to name a couple specific AACE products or services that stands out to him, he says, “AACE’s TCM Framework represents a comprehensive best practice for our industry. I recommend it often to people interested in understanding more about what we do. At the same time, AACE provides one of the best annual conferences I have ever attended. They always do such a professional job in organizing everything and ensuring great presentations.”

Caddell is a senior vice president at Turner & Townsend, a global project management consulting firm. “I am responsible for its Houston Energy cost center, supporting approximately 110 staff,” explains Caddell. He adds, “At the same time, I do a number of consulting commissions, with risk analysis reviews being the most common. I love consulting because it appeals to my short-attention span brain. I get to do different things all the time.”

Addressing his education background, Caddell says he received a BS of Civil Engineering from Rice University and an MBA from the University of Texas in Austin. He adds, “I am a registered professional engineer in Texas.” Next, he says, “I believe that those combined degrees help me understand how to evaluate a situation, break it into its components, and analyze how to make improvements. I say that the engineering degree did not tell me the answer, it taught me how to find the answer.”

Explaining what he sees as one of the most rewarding aspects of his job, he says, “I really enjoy being able to help people, be it either staff that I support or clients I support. Helping someone learn a new skill or develop their career is always gratifying. At the same time, helping clients understand their projects better or helping them improve their probability for success is very fulfilling.”

A critical problem Caddell sees for the cost engineering profession is that, “Cost engineering providers always seem to suffer from an image
problem. It seems we constantly have to justify and demonstrate the value we provide.” He believes a solution would be for AACE to take on an initiative, maybe through its technical subcommittees, to start collecting both hard and soft data to help cost engineers demonstrate how they improve a project’s and an organization’s performance.

Addressing his personal life, he says, “I have been happily married for over 27 years to my wife, Patti. We have two wonderful boys, 19 and 16. The oldest boy, Matthew, is attending the University of Illinois, studying computer science. Our youngest, Andrew, is a junior in high school and still defining what he wants to do in life. He loves choir and achieved top marks at the state level competition for choir solo performance.” Caddell adds, “Patti and I have always been very involved in our kids activities from a young age to this day, including swimming, band, and choir. We have loved spending time with all the kids and getting to know the parents.” He concludes, “I can’t say I do a good job at a work/life balance. I am fortunate to have Patti to take care of the boys, the house, our finances, and basically everything else.”

A career in cost engineering is basically in his blood. He explains, “Working in projects is sort of in my blood. My father worked for a construction company, Blount, for many years before leaving to start his own company when I was in college. He has been extremely successful and helped me to appreciate the joys of construction. So I feel like I have always been moving in this direction. I knew shortly after starting college that although I was going to study engineering, I wanted to go into consulting.

What advice does Caddell have for anyone who might be thinking of cost engineering as a career path. He says, “With regards to advising others that may aspire to consulting in this field, I really think you have to “live” a project or two from beginning to end to understand how to develop a project and how to execute it and ultimately close it out. By doing so, you get to learn how decisions made early in the project play out as the project progresses.”

Again, he supports all things AACE and says, “I am just really grateful for the opportunity to serve on the board and give back to the industry that has supported me. I am also happy to be able to work with the really great people that work for AACE and those that serve on the board. Everyone is truly focused on making AACE the best it can be for its members. Thank you.”

◆

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MANAGING PROJECT CHANGE ORDERS

Jeffery Borowicz, AIC CPC CCP PSP CPE CEP CCP CCA
Technical Board Member

Project change order management is defined by AACE as: “CHANGE MANAGEMENT – The formal process through which changes to the project plan are identified, assessed, reviewed, approved and introduced.”

Fair Contract Language is the key to any effective change order (CO) management system.

The Identified Change can be issued by all parties during a project; usually: owner, engineer, architect, third party consultants, contractor, or subcontractor(s).

Proposal Development by the Contractors usually includes solicited cost proposals from their specialty subcontractors, as well as, development of their own self-performed work proposals. Once gathered, the prime contractor summarizes the overall proposal and includes their mark-up fee to proposal. The detailed proposal is then sent to the owner for review.

The contractor’s proposal submittal of their value for the work should include cost and schedule changes that identify impacts due to this change in scope.

Proposal Assessment of the contractor’s initial proposal should be received by owner and placed in the change order tracking log. CO should be delivered in the contractual agreed upon format, and in a timely manner, so a quick turn-a-round review of the change order, by the owner, can be conducted.

The owner will conduct their own due diligence in reviewing the change (or through their Engineer or third party consultant) and decide the merits of the change order. After the change is reviewed, four (4) decisions can be determined:

- A decision to accept the proposal value
- A decision to negotiate a value of the change
- A decision to deny or reject the change
- Decision to enter into a disputed claim

Once Change Order is approved, contractor can begin the CO work in the field, Owners and contractors must understand the consequences for the change order process in relationship to conducting the work. When issuing a notice to proceed on a CO, the contractor is obligated to construct the CO, while the main contract work is still under way. When the contractor proceeds with the CO work, expedient payment for the work should follow within the next business payment cycle, unless change is a multi-month, progress payment.

Getting Paid - Getting change orders physically processed, in an orderly fashion, while keeping the (sub) contractor(s) cash-flow viable is crucial to success of the project.

Owners point of view: The owner should look at the changes in a fair and equitable manner and realize changes during construction hap-
pen and they should budget dollars that allow for contingency or management reserves to be used for processing change order work.

Contractors point of view: Contractors approach change orders as mini-sub project(s) that require supervision resources to manage labor, materials and equipment to construct the work and keep the project on schedule. The contractor should ethically produce the CO estimate that shows a true representation of the cost and schedule implications.

Subcontractor’s point of view: If the prime gets paid for change orders after a 30 day cycle, then the subcontractors usually waits another 30 days to be paid by the prime contractor. This causes potential cash flow issues for the subcontractors if their change orders are held up with disputes. Cash flow is key to success on change management cycles.

In Summary, by having fair contract documents that meet the owner and contractor needs, the change order process can be a very satisfying and rewarding experience for all parties.

PERFORMANCE ASSESSMENT REPORTING

The AACE International Total Cost Management Framework describes project performance assessment as, “the process of comparing actual project performance against planned project performance and identifying variances from planned performance.” The performance assessment reporting process feeds decision-making which is the core activity that either advances projects or stalls them. The quality of the information given to decision makers can greatly influence project outcomes. When establishing your performance reporting system you should consider the following:

Timeliness of the Information—The problem with many reporting processes is that too much time and effort is spent crunching the numbers and chasing down false reads, leaving less time for analysis and recommendations for mitigations and/or corrective measures. As stated in AACE Recommended Practice 72-12: Developing a Project Risk Management Plan, the first critical success factor is, “timely identification and assessment of risk items. The point is that performance information is only valuable if it comes in a timely manner; the information must identify risks or issues when they are actionable for corrective action and or mitigation.

Risk Significance of the Information—Identify and prioritize the key project risk drivers, putting a laser-like focus on those items. Rigorously measure and manage those significant critical risks with more frequency and focus to drive more positive project outcomes and use this knowledge in decision making. Of course, it is always advisable to measure everything at least a monthly basis to ensure nothing is off the project performance measurement radar, but it should be weekly for risk critical efforts.

Credibility of the Information—Earned value, when used properly, can provide and objective measure of progress and performance. The problem is that subjective earning rules, (such as level of effort, supervisor’s best guess, and allowing credit for working out of sequence) leave many earned value reporting systems vulnerable to variance masking. This masking often causes reporting staff to conflate or bury issues until they are no longer actionable for mitigation or corrective actions. Projects must use objective progress measurement rules of credit and then ensure that change management is rigorously applied; so budget, cost, scope and schedule are aligned and therefore project staff has a credible basis for decision making.

Analyzing the Information—Decision-makers can often become reticent to make a choice, or prone to make the wrong choice, when too many options are presented or the resolutions are unclear. Decision makers also can be deceived when they are left to make their own interpretation of the data, or when the context is not reflective of the actual situation. The task of the reporting staff is to drill down to the point where they understand the root causes of the issues, so they can then go beyond the numbers to facilitate better decision making. Staff needs to provide decision-makers the key insights into the interpretation of what the numbers are saying or not saying. Numbers do not have a voice, but analysts do! Projects usually have plenty of problem spotters, but never enough problem solvers. Strive to be a problem solver.

Good performance reporting is essential to improving project outcomes. The decisions made based on the reported performance data often determine the success or failure of a project. Decision-making is difficult. In some situations, where it is unclear what the best decision is, it is often a good idea to choose the minimum decision necessary to move things forward while keeping other options open. This minimizes the risk of rework and still continues progress on your project.
THE TOP 10 REASONS TO JOIN AACE INTERNATIONAL

TIME
Gain access to a wealth of resources that will save you time and money! You’ll stay informed about the complexities of the cost and management profession -- plus you’ll have access to discounts on educational programs, publications, and more!

INFORMATION
Locate thousands of technical papers and publications in the Virtual Library. AACE’s database is keyword searchable for quickly locating appropriate reference articles.

CAREER
Members can post resumes at no additional cost in our Career Center and keep your career on track through information sources such as our annual Salary and Demographic Survey of Project and Cost Professionals.

LEARNING
We offer numerous online learning courses on estimating and project management. The Approved Educational Provider program helps maintain high quality development courses and providers. AACE also holds many seminars throughout the year.

RESOURCES
Starting with the TCM Framework and Recommended Practices that are available for free only to members to our bi-monthly publication Cost Engineering featuring articles for cost professionals around the world. Through the mail or via the AACE International website, the Cost Engineering journal is a great current resource for members and as a member, you gain access to an archive of past issues.

TECHNICAL DEVELOPMENT
Increase your knowledge and expertise by joining one of AACE International’s many technical subcommittees, subcommittees, and Special Interest Groups (SIG’s) at no additional cost to members. Discuss industry problems with your peers or help experts develop new and improved techniques and practices for the profession.

NETWORKING
By attending a local section or our Annual Meeting for interesting speakers, informational tours, social dinners and much more. The online Membership Directory is an excellent source for a list of contact information on thousands of members. Join one of our many technical subcommittees and participate in the AACE Forums - a great way to tap into the collective wisdom and experience of our world-wide membership.

EXCELLENCE
Our certification programs are independently accredited by the Council of Engineering & Scientific Specialty Boards. AACE certifications are a recognized credible standard in the cost management field. A recent study shows that individuals with an AACE Certification earn 17.4% more than their counterpart without a certificate.

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www.aacei.org
It has been five years since the Certification Board adopted a formal anti-plagiarism policy. During this time we have noticed marked improvement from 27 cases in 2011, our first year of checking for plagiarism, to one case in 2014. With a whopping 97% decrease, we felt confident that the plagiarism plague was behind us.

However, in 2015, we ended with three cases of plagiarism. As of July 31, 2016, we have already handled five cases of plagiarism, making us concerned that the trend is on the upswing (see Figure 1).

Despite the Certification Board’s strict policy, and stringent punishment, published on our website that is also reiterated in written correspondence, and telephone counseling to examination candidates, it appears our anti-plagiarism policy is worth repeating to assist current and future examination candidates in avoiding the unethical and illegal practice of plagiarism.

What is Plagiarism?
Plagiarism is considered any wording used in the Certified Cost Professional (CCP) technical paper that is not the author’s own words, and not quoted with a bibliography entry. Plagiarism is unethical and nothing less than stealing someone else’s intellectual property. The Certification Board believes there is absolutely no excuse or tolerance for plagiarism. The CCP designation carries with it an ethical standard that cannot be tarnished with individuals stealing another person’s intellectual property.

According to Plagiarism.org, the following can be considered acts of plagiarism:

- Turning in someone else’s work as your own
- Copying words or ideas from someone else without giving credit
- Failing to put a quotation in quotation marks
- Giving incorrect information about the source of a quotation
- Changing words but copying the sentence structure of a source without giving credit
- Copying so many words or ideas from a source that it makes up the majority of your work, whether you give credit or not (What is Plagiarism?, n.d.) [1].

Figure 1 – AACE International Plagiarism Cases 2011 to 2016
How is my CCP Technical Paper Checked for Plagiarism?

AACE International has contracted with CheckForPlagiarism.net to provide plagiarism check services for all technical papers of the association. This includes technical papers submitted for the Annual Meeting, Cost Engineering Journal, and Source (under the direction of the Technical Board) and the CCP certification technical paper (under the direction of the Certification Board). This robust and well-respected software is similar to that used by universities and other professional associations to assure the integrity of their submission process.

AACE must protect the organization from any litigation that may arise from publishing work that fails to meet the standards against plagiarism. No other software will be considered. Authors may not submit their technical papers to another plagiarism checking vendor to contest the results of the software AACE has sanctioned.

What is the Plagiarism Check Process?

Once a CCP technical paper is received:
1. The word count is assessed and recorded (less than 2,500 is an automatic fail).
2. The paper is prepared and uploaded to CheckForPlagiarism.net for processing. The results are typically received within 24-hours.
3. Papers reported by the software to contain ≤ 10% plagiarism will continue to the next step in the grading process.
4. Papers reported by the software to contain > 10% plagiarism are rejected. The author is notified of imposed penalties and provided a full copy of the plagiarism report, which details the passages of plagiarism. The author is also given instructions on how to file an appeal.

It is important to note that every technical paper above the 10 percent threshold is also manually reviewed to ensure that certain anomalies are handled properly. For instance, there are common phrases and terminology to our industry that will get flagged for plagiarism. During our manual review, we detect those areas and deduct the allotted percentage.

There have also been cases when an author has used their own published, previous work, and did not feel the need to cite; it will be flagged by the software as plagiarism. Once again, the manual review is a great quality check to ensure examination candidates are not erroneously penalized for things an algorithm cannot correctly decipher.

Therefore, it is the net percentage of plagiarism of a technical paper that will determine if it is rejected, or not.

What are the Penalties for Plagiarism?

For the first offense of plagiarism the candidate is immediately suspended from the certification program for a period of not less than one year, resulting in revocation of the individual’s AACE International certification application, and revocation of any currently held AACE certifications.

If the candidate wishes to obtain any AACE International certification, upon completion of the suspension, the individual must submit a new application, fees, and fulfill all other requirements that are in place upon expiration of the suspension period. Any suspended certifications will be reinstated, with no credit given for the 12-month suspension period.

For the second offense of plagiarism the candidate is permanently expelled from participation in the AACE International certification program. After Certification Board action, all second offenses will be referred to AACE International Ethics Committee for further sanctions for violation of the AACE Canons of Ethics and its code of ethical conduct. Sanctions may include revocation of all of the individual’s AACE International certifications, as applicable.

The certification program takes plagiarism very seriously and will strictly enforce the penalties where plagiarism is found. As noted above, plagiarism is also considered a breach of our Canons of Ethics, and individuals found to be engaged in the practices may also be subject to membership sanctions from AACE International.

Is There an Appeals Process?

The Certification Board provides every candidate the opportunity to formally appeal the plagiarism report within 14 days of notice to contest the decision and provide documentation and affidavits to establish authorship. The burden of proof is upon the candidate to unequivocally show the material cited was their own intellectual property, or that there was a mistake made by the software review program.

Is There a Way to Check My Paper for Plagiarism Before Submitting to AACE?

Yes; candidates may independently submit their CCP technical paper to CheckForPlagiarism.net for a nominal fee, when using the link on our website. This effort is only to provide assurance to the candidate and to pinpoint problem areas to correct before officially submitting to AACE for examination. The candidate’s report will not be accepted as the official plagiarism check for certification examination.

What is the Cure for the Plagiarism Plague?

The cure is very simple.

First, use your own work, words, thoughts and ideas. The majority of your technical paper should represent your knowledge and communication skills, to which you are affirming on your signed technical paper affidavit.

Secondly, provide proper credit (and citation) when referencing another person’s work, words, thoughts or ideas. Resist the temptation to believe you have the right to claim authorship if you alter certain words or phrases of someone else’s work, no matter how slight or great.

Becoming a Certified Cost Professional (CCP) carries a high degree of distinction and respect in the industry. Therefore, it demands all candidates to conduct themselves in a manner worthy of the title. Plagiarism has no place in the AACE International Certification Program, and will not be tolerated.

Help us eradicate the plagiarism plague by spreading the word and adhering to our anti-plagiarism policy.

REFERENCE
Congratulations to all 2016 AACE International Award Recipients!

AACE International was honored to recognize award winners at its 2016 Annual Meeting, June 26 to June 29 in Toronto. It is through such outstanding ability, service, and dedication displayed by our members that AACE International is able to continue to be the strong organization that it is. Our thanks go to you for the hard work, long hours, heartfelt involvement, and commitment to excellence that these awards symbolize. It is our great pleasure to share these awards with you and to acknowledge everything you have given to AACE International. Congratulations!

Outstanding Regional Director

Christopher P. Caddell, PE CCP DRMP – Chris joined AACE in 2001 and became a Certified Cost Professional (CCP) in 2010 and earned his Decision & Risk Management Professional (DRMP) in 2013 as a result of his work on the task force that developed the certification. Chris has also been a member of the Decision & Risk Management Technical Subcommittee since 2003. He has more than 20 years of project experience and is currently a Senior Vice President at Turner & Townsend. Chris was elected to the Board of Directors as Director-Region 5 for the 2015-2017 term. Chris was previously recognized by AACE with the Technical Excellence Award (2012) and Outstanding Subcommittee Chair Award (2013; 2014).

Outstanding Young Professional Award

Sandra Mejia Villegas – Sandra joined AACE in 2012. She is the co-chair of the Women in Project Controls Committee (2015-present). Sandra is a member of the Vision 20/20 Task Force (2015-present). She has participated in training workshops with the Chinook-Calgary Section since 2011. She participates in AACE’s Mentoring Program. Sandra is a Cost Analyst at ConocoPhillips.

Outstanding Woman in Project Controls

Pamela DeGraaf – Pam joined AACE in 2009. She is active in the Aurora-Edmonton section having previously served as vice president/treasurer, Pam is getting ready to take the reins of the role of president for the section. Pam is a Project Controls Manager with Stantec Consulting where she is the leader for a company-wide process improvement project.

Brian D. Dunfield
Educational Service Award

Dr. Osama El Moselhi, P. Eng. FAACE – Osama joined AACE in 1986. He has been active with the Montreal Section since joining AACE. He served the Montreal Section (1989-1991). Over the years, Osama has organized workshops and seminars on total cost management and has encouraged university students to actively participate in all section functions.
Osama is the Professor and Chair of Engineering at Concordia University. He is a frequent author and presenter at AACE’s Annual Meetings. He has also been widely published in a number of global technical publications. Osama has previously been recognized by AACE as a Fellow (2003).

Anthony J. Werderitsch, PE CCP CFCC FAACE Hon. Life – Tony has been an active member of AACE since 1971, and currently involved in the Great Lakes Section. With over 40 years of experience in major engineering and construction projects, he has assisted in the educated of thousands of corporate, government, institutional, and associations’ representatives. He is currently the Executive Vice President of Administrative Controls Management Inc., is a registered Professional Engineer (PE), and holds the AACE designations of Certified Cost Professional (CCP) and Certified Forensic Claims Consultant (CFCC). Anthony has also co-authored ACM’s Project Management Planning & Scheduling, Fundamentals of Cost Estimating. He has written and presented numerous papers to professional groups and industries about Total Cost Management (TCM), serving as an expert in regards to construction delay claims. Tony has previously been recognized by AACE as a Fellow (1987), Honorary Life Membership (1995), O.T. Zimmerman Founder’s Award (2004), and the Award of Merit (2015).

Outstanding SIG Chair Award

Anthony M. Woodrich, CCP – Tony joined AACE in 1996 where he has also been a member of the Great Lakes Section. He became a Certified Cost Professional (CCP) in 1997. He has been the Co-Chair of the Utilities/Energy SIG since 2014. He has been a frequent technical paper author and presenter at AACE Annual Meetings. He has served as an instructor and trainer in a variety of courses for his company. He is President of the Microsoft Project User’s Group – Detroit Chapter. Tony is a Vice President at Administrative Controls Management, Inc. (ACM).

Technical Excellence

Charlie Jackson, PSP – Charlie joined AACE in 2010. He earned the Planning & Scheduling Professional (PSP) certification designation in (2010). He has authored and presented multiple technical papers at the AACE International Annual Meetings and in Cost Engineering journal. He has implemented procedures for both scheduling and document control systems for clients across the U.S. Charlie is a Senior Consultant with Project Life Span.

Hannah E. Schumacher PSP – Hannah joined AACE in 2006 and became certified as a Planning & Scheduling Professional (PSP) in 2009. She has served AACE International as a member of the Certification Board (2011-present). She is a frequent author and presenter of technical papers at AACE Annual Meetings. Hannah is a Managing Consultant for Hill International, Inc. She has served the Arizona Section in a variety of leadership roles including president (2010--2012). She has served as the Planning & Scheduling Subcommittee’s Co-Chair since 2015 and previously served as secretary. Hannah has previously been recognized by AACE with the Outstanding Woman in Project Controls Award (2011).

Charles V. Keane Distinguished Service Award

David Williams, CEP – Dave joined AACE in 1993. He obtained the Certified Estimating Professional (CEP) designation in 2008 after successfully passing the beta examination being developed by the CEP Task Force. He volunteers for the Certification Board as a CEP memo grader (2014-present). Dave has been active in sections wherever he has lived and worked. Most notably, Dave served as a charter member and president of the Tri-Cities Section (TN) (1996-1997) before becoming the president of the Chinook-Calgary Section (2002-2003). He continued to serve as the Chinook-Calgary Section’s seminar director (2007-2012). He has served as a lecturer on project controls and estimating at the University of Calgary. Dave has mentored and engaged new and prospective members in a variety of section activities.

O.T. Zimmerman Founder’s Award

Stephen L. Cabano – Steve joined AACE in 1995. He has been a frequent author and presenter of technical papers at AACE Annual Meetings and a variety of other conferences. He has also been an instructor of various continuing education courses for AACE Annual Meetings. He is a member of a number of professional associations including the Engineering and Construction Contracting (ECC) where he served as past Chairman. Steve is the President/COO at Pathfinder, LLC. Along with his team at Pathfinder, Steve organized and led the design and implementation of the special industry track of presentations on energy at the 2014 Annual Meeting.

TCM Excellence Award

H. Lance Stephenson, CCP FAACE – Lance joined AACE in 1999 and became a Certified Cost Professional (CCP) in 2003. He has been an active member of the Technical Board since 2007. Lance is the architect behind the Visual TCM Framework, the inter-active web enabled TCM Framework; and, he was the ed-
itor of the TCM Framework: An Integrated Approach to Portfolio, Program, and Project Management, 2nd Ed. Lance is a Skills & Knowledge Trainer for the Aurora Edmonton Section. He has published numerous papers and articles on cost engineering topics and has been a presenter in Canada, Malaysia, The Netherlands, and the United States. Lance has authored and contributed to many of AACE’s Recommended Practices. He is a Senior Manager, Project Controls at Enbridge Pipelines. Previously, Lance was recognized by the Association with the Technical Excellence Award (2011) and was named a Fellow (2014).

AACE International Fellows

Peter R. Bredehoeft, CEP FAACE – Pete joined AACE International in 1989. He obtained the certification designation of Certified Estimating Professional (CEP) in 2008. Bredehoeft was a member of the CEP Task Force that developed the CEP Certification. Pete is the author of one Recommended Practice (RP): 56R-08, Cost Estimating Classification System – As Applied for Building and General Construction Industries. He has further been a contributor for 13 RPs. Pete is active with a number of AACE Technical Subcommittees: Building Information Modeling; Cost Estimating; Government & Public Works; and Planning & Scheduling. Pete has worked on behalf of AACE to collaborate with members of ASPE and RICS to develop information exchange requirements and an information delivery manual for submission to the National BIM Standards group. Pete is the Chief Estimator and Estimating Technology Leader for CH2M Hill. He was previously recognized by AACE with the TCM Excellence Award (2009).

Madhu P. Pillai, CCP FAACE – Madhu became a member of AACE International in 2004 and earned his Certified Cost Professional (CCP) designation the same year. He has been a frequent presenter at conferences around the globe. Madhu has been extremely active with a number of AACE Technical Subcommittees: Building Information Modeling; Cost Estimating; Government & Public Works; and Planning & Scheduling. Pete has worked on behalf of AACE to collaborate with members of ASPE and RICS to develop information exchange requirements and an information delivery manual for submission to the National BIM Standards group. Pete is the Chief Estimator and Estimating Technology Leader for CH2M Hill. He was previously recognized by AACE with the TCM Excellence Award (2009).

John J. Ciccarelli, PE CCP PSP FAACE – John joined AACE International in 2001 and earned the certification designations Certified Cost Professional (CCP) in 2003 and Planning & Scheduling Professional (PSP) in 2006. He has been a frequent author and presenter at AACE Annual Meetings. John served two terms as President of the New Jersey Section as well as holding other positions of leadership on the section board. He was a contributing author to the Recommended Practice (RP) 29R-03: Forensic Schedule Analysis. He has been a regular contributor to the Claims & Dispute Resolution Technical Subcommittee since 2006. John has been elected to and served on AACE’s Board of Directors as Director-Region 2 (2008-2010); Vice President Finance (2010-2012); President Elect (2012-2013); President (2013-2014); and Past President (2014-2015). He has previously been recognized by the Association with the Outstanding Regional Director Award (2009). He holds a BCE from the University of Delaware and an MBA from Rutgers University. John is a Senior Vice President at Marsh Risk Consulting.

F. Sam Griggs, CCP FAACE – Sam joined AACE International in 1980 and earned the certification designation of Certified Cost Professional (CCP) in 1981. He has presented a number of papers at AACE Annual Meetings – the first one was published in 1978. Sam has served on the North Florida Section board (2000-2003) and was a member of the Local Arrangements Planning Committee for the 2003 Annual Meeting. Sam has been a member of AACE’s Certification Board (2006-Present). He also serves as AACE’s representative to ICEC on the accreditation committee. In 2014, he was named as an ICEC Distinguished International Fellow.

Marc Glasser, PSP FAACE – Marc joined AACE International in 2004 and obtained the certification designation of Planning & Scheduling Professional (PSP) in 2005. He served as a member of the Certification Board (2007-2012) where he was PSP Certification Coordinator (2007-2011). Marc served two terms as president of the Southern California Section and one term as vice president. He has been an instructor of the Project Controls – Planning & Scheduling course at the University of Southern California (2003-2015). Marc has previously been recognized by AACE with the Charles V. Keane Distinguished Service Award (2013).

Sagar B. Khadka, CCP DRMP PSP FAACE – Sagar joined AACE International in 2004. He obtained the certification designations of Certified Cost Professional (CCP) in 2009, Decision & Risk Management Professional (DRMP) in 2013, and Planning & Scheduling Professional (PSP) in 2006. Sagar was a member of the DRMP Task Force that developed the DRMP Certification. He was an author/contributor to the first edition of the TCM Framework for sections that were developed by the DRMP Task Force. He has been active with the National Capital Section through training programs. Sagar has served as a member of the Certification Board (2010-present). Originally from Nepal, Sagar earned his BS in Civil Engineering from Mangalore University (1986) before moving to the United States where he obtained his MS in Civil Engineering from Virginia Polytechnic Institute and State University (1993). He is the Director, Project Risk Management Services at McDonough Bolyard Peck.

Marc Glasser, PSP FAACE – Marc joined AACE International in 2004 and obtained the certification designation of Planning & Scheduling Professional (PSP) in 2005. He served as a member of the Certification Board (2007-2012) where he was PSP Certification Coordinator (2007-2011). Marc served two terms as president of the Southern California Section and one term as vice president. He has been an instructor of the Project Controls – Planning & Scheduling course at the University of Southern California (2003-2015). Marc has previously been recognized by AACE with the Charles V. Keane Distinguished Service Award (2013).
active with the India Regional Section where he held the office of President (2006-2008) and the Arabian Gulf Section where he held the offices of Certification Director (2005-2006), President (2007-2008), and Steering Committee (2010-2013). He currently serves as the Region 1 Deputy Director (2014-2016) for the International Cost Engineering Council. Madhu is currently associated with Kentz Engineering International Company Limited (Member of SNC-Lavalin Group) as Projects Director in Saudi Arabia. Madhu has worked tirelessly to serve AACE members, especially outside of North America. He was the chair of AACE’s first International TCM Conference Planning Committee (2012). Madhu has been elected to and served in a leadership role on AACE’s Board of Directors as the first Director-Region 7 (2008-2010) and as the first Vice President Regions - International (2014-2015). In addition to being recognized as a fellow of the Institute of Chartered Surveyors (2014) and the Institution of Engineers (India) (2014), Madhu has previously been recognized by AACE International with the O.T. Zimmerman Founder's Award (2008).

HONORARY LIFE MEMBERSHIP

Douglas W. Leo, CCP CEP FAACE Hon. Life – Doug joined AACE in 1994 and became a Certified Cost Professional (CCP) in 1998 and was grandfathered as a Certified Estimating Professional (CEP) in 2008 following his work on the CEP Certification Task Force. He has been active with the Genesee Valley Section serving as an officer since 1994 including four terms as President. He was elected to AACE leadership as a member of AACE’s Board of Directors as Director-Region 2 (2002-2004). He has served as the co-chair of the Estimating Technical Sub-Committee since 2000 and as the chair of AACE’s Constitution & Bylaws Committee since 2004. He is a frequent author and presenter at AACE’s Annual Meetings. Doug is a Management Consultant at DWL Project Solutions, Inc. Doug has previously been recognized by AACE as a Fellow (2012), Brian D. Dunfield Educational Service Award (2015), and Outstanding Technical Subcommittee Chair Award (2015).

Kul B. Uppal, PE CEP DRMP FAACE Hon. Life – Kul has been a member of the Association since 1988 and a member of the Association’s Technical Board since 1998 where he serves as Director – Technical Committees Divisions. Kul served on the Certified Estimating Professional (CEP) Task Force where he was admitted as a CEP in 2008 as well as the Decision & Risk Management (DRMP) Task Force where he was admitted as a DRMP in 2013. He has served as a member of the Cost Engineering Committee since 2002. He is a frequent author and presenter at AACE Annual Meetings. He has contributed to multiple Recommended Practices (RPs) and as editor of multiple Professional Practice Guides (PPGs). He is a Senior Consultant with Conquest Consulting Group. Kul has previously been recognized by the Association with the Total Cost Management Award (2002) and was named a Fellow (2010).

Award of Merit


Industrial Appreciation Award

Independent Project Analysis (IPA)– Founded in 1987, Independent Project Analysis (IPA), Inc. is the preeminent consultancy in project evaluation and project system benchmarking, and has become the industry leader in quantitative analysis of project management systems. The largest oil companies, chemical producers, pharmaceutical companies, minerals and mining companies, and consumer products manufacturers improve their capital project delivery systems using IPA’s consulting and project management training services. IPA’s value proposition relies on the quantitative research base of the consulting analysis and services the company provides. IPA possesses a large, unique database that contains detailed information for over 16,000 capital projects executed worldwide in numerous capital intensive industries.
**Lifetime Achievement Award**

**Donald F. McDonald, Jr. PE CCP PSP FAACE Hon. Life**  — Donald has served AACE as a member of the Education Board (1986-2016). He previously served as the Education Board Chair (1989-1992). He has worked with the Education Board in the development of the Competitive Scholarship Program where AACE over the years has made available hundreds of thousands of dollars to college scholarship funds to young professionals. He has also served on AACE’s Board of Directors as a Technical Director (1995-1996) and Vice President T/E/C (2013-2014). Donald joined the Association in 1985, became a Certified Cost Professional (CCP) in 1996, and served as a member of the task force which created the Planning & Scheduling Professional (PSP) certification program to which he was grandfathered as a PSP in 2004. Donald was a co-author of AACE’s Recommended Practice 25R-03 “Estimating Lost Labor Productivity in Construction Claims” and continues to participate in various RP development efforts. He is a frequent presenter at AACE’s Annual Meetings, served as an instructor in continuing education courses, authored technical articles, and he has contributed to other AACE publications. Donald has previously been recognized by AACE as a recipient of the O.T. Zimmerman Founder’s Award (2001), AACE Fellow (2005), the TCM Excellence Award (2008), Honorary Life Membership (2010), and the Award of Merit (2013).

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**AACE INTERNATIONAL SECTION RECOGNITION AWARDS**

Each year AACE Sections have the opportunity to be recognized through the Section Recognition Awards Program by submitting required information on their activities during the past year. The following sections have been recognized for their achievement during the 2015-2016 year as follows:

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<th>Bronze Award (400-699 points)</th>
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Mariapilar Gonzalez Fuenmayor was born in Maracaibo, Venezuela. She obtained her degree in industrial engineering at the Universidad del Zulia. She began her career at Consultores Occidentales S.A., an engineering company in the region, developing major projects for the national oil industry. She completed her studies in cost estimating, including the calculation of unit prices for work, which led to her first steps as a cost estimating engineer.

Over the years Mariapilar worked in several consulting companies as a project cost estimator for the oil and gas industry in Venezuela, where she was involved in projects such as Petrozuata, which pioneered the development of the Orinoco oil basin, where heavy oils are treated. She worked for some years at Lufkin de Venezuela, a well-known metal mechanic company, where she estimated the costs for manufacturing pressure vessels and other work related to the oil industry. In 2003, she began working for construction contracting companies, doing cost estimates for tenders or bids. Here she learned the art of costing in a competitive environment. This was a challenge to estimate the costs to win the bid.

In 2010, Mariapilar was sought out by Ecopetrol and offered a job, and because of political problems in her country, she moved to Colombia in March 2011. She now works for the largest refinery in Colombia as a cost professional. She and her daughter left her country, full of dreams and desires, to go to a place where they value people and respect her skills. In December 2011, she was promoted to the cost manager in Ecopetrol’s vice-presidency of refining and petrochemical products project management.

In June 2014, Ecopetrol sent her as a representative to AACE International’s Annual Meeting in New Orleans, Louisiana. She was able to

The opportunities that AACE International provides are incredible, and have resulted in my being recognized as a leader in cost estimating. This is a result both of the skills and knowledge I have acquired, and the opportunity to meet and share experiences with other cost professionals throughout the world.
acquire a lot of knowledge from qualified people and discover the advantages of belonging to AACE International. In November 2014, she passed the exam and received her certification as a Certified Cost Professional (CCP), with full support from Ecopetrol, after one year of hard study. She has shared her knowledge with her Chilean and Colombian colleagues, and consolidated the knowledge she has gained over the years as a cost engineer.

Currently, Mariapilar has been able to leverage some initiatives within her work, using the knowledge learned during her certification study. She is leading efforts to implement best practices in her company, including concepts such as Work Breakdown Structure (WBS), parametric estimating, database usage, quality improvements, and detailed presentation of cost estimates for projects in all of their maturity stages have been consolidated. Additionally, she has been given the role as an in-house instructor and provides courses to other departments in the company.

Reflecting on all this, Mariapilar states that, "the opportunities that AACE International provides are incredible, and have resulted in my being recognized as a leader in cost estimating. This is a result both of the skills and knowledge I have acquired, and the opportunity to meet and share experiences with other cost professionals throughout the world." In summing up her philosophy, Mariapilar emphasizes the, "importance of wanting to achieve a goal and never abandoning it, not for a second, and being focused until reaching it!"
Yemi currently works as a project controls professional and independent contractor/consultant in Houston, Texas. He has six plus years' of experience providing information systems and data management solutions through data analysis, data mapping, and data modeling support to technical and non-technical multifunctional project teams. Yemi is considered a dependable team member and he is well known for his ability to significantly raise team wide productivity through his decision support and process improvement initiatives. He is a proactive member of the Houston Gulf Coast Section and has been actively involved in his local section since 2012. He currently serves on the section’s board of directors, as secretary and is actively involved in other volunteer and community engagement activities in the greater Houston area. Recently, Yemi spearheaded the re-launch of the HGCS website which has been highly recognized among the broader AACE community. His contributions have proven invaluable on several other strategic initiatives for HGCS’s Board of Directors.

Yemi says many project controls professionals in the HGCS section are impacted by the recent downturn in oil and gas prices and thus the Houston jobs market is quite fragile. Announcements of layoffs and delayed capital project spending are common. These challenges have made the search for a job all the more difficult. Yemi is using the opportunity to pursue AACE certifications and training while leveraging the networking opportunities with plans to secure an awesome project controls role.

AACE provides exceptional opportunities for networking, information and idea sharing, career development, and leadership that translates into upward mobility in one’s career.

Yemi got into project controls while conducting a project audit for the demolition of an old building that had exceeded its useful life. During the project audit, Yemi developed a keen interest in understanding the intricacies needed to successfully complete a project. He worked to simplify and present information needed for the work breakdown structure and schedule as necessary to manage both cost and risk to facilitate management decisions. Yemi started in building construction and is seeking a transition to project controls in the oil and gas industry, where the “Great Crew Change” will create numerous opportunities for younger project controls practitioners.

Yemi’s says, an interest in planning, scheduling, risk management, and cost control, which are factors of a project’s success, attracted him to project controls. His father is a construction
manager and his love for construction rubbed off. He was mentored and nurtured by his uncle Henry who is an IT professional. Yemi also says, “the AACE’s Houston Gulf Coast Section Board of Directors leadership, engagement, and professionalism, consistently inspires and encourages his profound interest in project controls.”

Yemi enjoys technical benefits offered through AACE International. He particularly likes the Total Cost Management Framework, Recommended Practices, and webinars. He says, “AACE products provide solutions and best practices that can be leveraged to resolve some of the current and long standing issues.” He also says, “AACE provides access to impressive project controls professionals in different industries where different perspectives are shared to benefit the professional community.”

Yemi credits AACE as extremely beneficial to his professional development. He discovered that there is an incredible sharing of information that helps to stay abreast of trends and best practices. The trainings and seminar opportunities have been invaluable in enriching Yemi’s mastery of project controls.

Yemi encourages other young professionals to, “take advantage of limitless opportunities for professional growth and impact offered by attending monthly and annual meetings, seminars, webinars, mentorship, and outreach programs.” He says, “AACE provides exceptional opportunities for networking, information and idea sharing, career development, and leadership that translates into upward mobility in one’s career.” He believes the Houston Gulf Coast Section Board of Directors has successfully expanded outreach and actively promotes new project controls professionals.

Yemi offers the following advice for other young professionals, “Project success depends largely on project controls.” He strongly encourages others to, “use their participation, development, and mastery of project controls to advance the profession and fuel the next generation of project controls professionals worldwide.”

John F. Gravel Joins FTI Consulting

FTI Consulting announces that John F. Gravel has joined the firm to lead its construction solutions practice in Vancouver, Canada. Mr. Gravel joins FTI Consulting from Turner & Townsend, where he served as Director of Natural Resources, North America, in charge of the mining practice.

For the last 20 years, Mr. Gravel has worked in international mining during which time he successfully managed client engagements on numerous large projects. Gravel served as Mining Track Lead at the 2015 AACE Annual Meeting in Las Vegas.

Mr. Gravel brings to the Vancouver team a wealth of experience gained in the Americas, Middle East, Europe, Australia and South East Asia. He has extensive commercial experience in developing and executing contracting strategies for clients including airports, highways, rail systems, power generation projects, open pit and underground mines, processing plants, and various civil engineering schemes.

He has given testimony as a procurement expert witness in Canadian arbitrations. He also has experience of procurement, contract administration and litigation proceedings.

Mr. Gravel is a Managing Director in the FTI Consulting Forensic and Litigation Consulting practice and is based in Vancouver, Canada. His experience has embraced a number of complex projects, including airports, highways, rail systems, power generation projects, open pit and underground mines, processing plants, and various civil engineering schemes. He has worked on projects in a variety of countries including the Americas, Middle East, Europe, Australia and South East Asia.

FTI Consulting, Inc. is a global business advisory firm dedicated to helping organizations protect and enhance enterprise value in an increasingly complex legal, regulatory and economic environment. With more than 4,400 employees located in 26 countries, FTI Consulting professionals work closely with clients to anticipate, illuminate and overcome complex business challenges in areas such as investigations, litigation, mergers and acquisitions, regulatory issues, reputation management, strategic communications and restructuring. The Company generated $1.76 billion in revenues during fiscal year 2014. For more information, visit www.fticonsulting.com and connect with us on Twitter (@FTIConsulting), Facebook and LinkedIn.
Determining the Measured Mile for Lost Productivity Claims

Dr. Tong Zhao, PE PSP and Mark Dungan

Abstract: Proving and quantifying lost productivity is one of the most challenging areas in construction claims. Among the available approaches, the measured mile method is ranked as the most preferred method to quantify lost productivity according to AACE International. The method is preferred, in part, because it eliminates disputes over the validity of the original estimate by comparing actual productivity of similar work, with the primary difference being the impacts in question. Since the distinction between the impacted and non-impacted sections in many projects is not readily observable, researchers and professionals have developed various procedures to help identify the measured mile. In this article, the authors will review various techniques that have been developed previously and present their Improved Baseline Method.
technique to separate the productivity data into different groups. The average value for the group with the best productivity would serve as the baseline. One issue with K-means clustering technique based method is that it does not guarantee a unique solution for baseline productivity.

In order to address the shortcomings in existing procedures to determine the productivity baseline, T. Zhao and J.M. Dungan [13] in their peer reviewed work published in the *Journal of Construction Engineering and Management*, presented an Improved Baseline Method (IBM). In the IBM, productivity data is segregated into two sets by using the overall average productivity. One set is for the unimpacted/lightly impacted data, and the other is for the heavily impacted data. The data within the unimpacted/lightly impacted set is made more reliable by excluding extreme data points which are not representative of the contractor’s proven productivity levels. This new method provides a useful tool to help determine a baseline that represents the attainable and sustained labor productivity, while reducing the subjectivity in baseline selection.

Data processing, cause and effect analysis, baseline selection, measuring productivity loss and responsibility allocation are all important elements in lost productivity analysis. This article, however, only focuses on determining the productivity baseline.

**Case Study**

On a municipal sewer upgrade project, a contractor was to replace and install 15 inch vitrified clay pipe (VCP) sewer pipes. According to the baseline schedule, the installation was planned to be performed in a dry season. Because of delays experienced in preceding work, the contractor actually performed 15” VCP replacement work in a stormy season and installation was hampered by muddy site conditions. Further, unmarked utilities and conflicts were encountered in multiple locations. The contractor had to skip those areas, and mobilize back later after a resolution was provided by the engineer of record. The production data compiled from contemporaneous documentation has been summarized in Table 1, and it can be seen that the impacts were pervasive.

### Applying Zink’s Measured Mile Procedure

A systematic procedure for measured mile calculation as a method was introduced by Zink [2][3]. The procedures Zink proposed include:

- Plot the actual labor worker-hours expended versus the corresponding percentage of work completion.
- Exclude the first and last 10 percent from the analysis because the productivity during these periods may be impacted by “build-up” and “tail-out” effects.
- Identify as the measured mile a linear or near-linear portion, showing the most efficient rate of progress in the middle 80 percent of the curve.

The measured mile selected by Zink’s procedure is a continuous period of time in which the most efficient productivity is uniform or nearly uniform. Another assumption for the original measured mile method is that the measured mile has to be impact free. Since the impacts were pervasive, there were no impact free periods that can be identified. For demonstration purposes, Zink’s procedure is still applied to the 15” VCP replacement work described in the section of case study. The first 10 percent and the last 10 percent of the total labor hours are excluded from analysis. Analysis of the actual labor hours focuses on the intermediate 80 percent of the labor hours.

<table>
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<th>Calculated Productivity (hr/lf)</th>
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<td>Muddy site and utility conflict</td>
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<td>50</td>
<td>4.00</td>
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<td>Come back work</td>
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<tr>
<td>35</td>
<td>120</td>
<td>48</td>
<td>2.50</td>
<td>Come back work</td>
</tr>
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</table>

**Table 1 – Contemporaneous Production for 15” VCP Sewer**
hours. Four consecutive daily productivities, day 18 to day 21, are identified as the measured mile period and the resulting measured mile productivity is calculated to be 3.37 hr/lf, as shown in Figure 1. In practice, a measured mile period or segment with uniform or nearly uniform productivity may not exist because of pervasive disruptions in many projects, including the case study project in this article. Zink did not define how to identify from the chart the linear portion that would represent the most efficient rate of progress. Consequently, this method of identifying the measured mile is subjective, and thus different analysts may select different portions as their linear or near linear segments. Further, a perfect linear portion is rare because of the normal variability in a contractor’s productivity. That is, the same worker or crew may not maintain an identical level of productivity between periods on a project even in the absence of disruptions assignable to other parties.

Applying Thomas’s Baseline Method

In order to improve on the weaknesses in the original measured mile method, which requires that the measured mile must be continuous and impact free, Thomas [11] defined a baseline period as a period of time in which the best productivity is achieved. However, the baseline procedure he proposed captures the reporting periods with highest production as the baseline. The baseline period is not required to be a continuous, non-impacted time frame, while the measured mile period has to be a consecutive set of time periods. The steps to determine a baseline proposed by Thomas and his collaborators can be summarized as follows:

1. Determine the total number of reporting periods;
2. The size of the baseline subset is selected as 10 percent of the total number of reporting periods and should not be less than 5;
3. The contents of the baseline subset are the reporting periods that have the highest production or output;
4. The baseline is the median or average of productivity value per period or the productivity average in the baseline subset.

Thomas and his collaborators did not offer a consistent criteria for use of average productivity or median productivity for the baseline set, and either of them has been presented in different publications [4][5][6][7][8][9][10]. Thomas’s baseline procedure is applied to the 15” VCP replacement work described in the case study. By Thomas’s procedure, the appropriate size of the baseline subset is five, the maximum of 10 percent of 35 days and 5. Five reporting periods with the highest production or output are selected as the baseline set, as shown in Table 2, which both the average and median productivity as calculated to be 3.23 hr/lf and 3.33 hr/lf. One weakness of Thomas’s procedure is that it could include heavily impacted reporting periods in the baseline set. In the baseline set selected using Thomas’s procedure, Day 7 appears more heavily impacted compared to most others, because the productivity of Day 7 is worse than the overall average. Because it uses production instead of productivity to identify the baseline, Thomas’s approach makes sense when the input in each reporting period is uniform or almost uniform because then the reporting periods with the highest productivity would be among the ones with the best production. When the input in each reporting period is not uniform, and the reporting periods with high production happen to be heavily impacted, Thomas’s approach could either fail to determine a viable baseline,
or it selects a baseline that includes significant productivity loss, which could be unfavorable and unfair to the claimant.

**Applying Gulezian and Samelian’s Control Chart Based Method**

Gulezian and Samelian proposed a statistical approach, based on a process control chart for establishing a productivity baseline, that reflects a contractor’s normal operating performance [11]. A control chart consists of:

- Points representing a statistic of measurement in samples taken from the process at different times.
- The mean of this statistic using all samples is calculated.
- A center line (CL) is drawn at the value of the mean of the statistic.
- The standard deviation of the statistic is also calculated using all samples.
- Upper Control Limit (UCL) and Lower Control Limit (LCL) that are drawn typically at three standard deviations from the center line.

To use the control chart to determine a productivity baseline, the metric on the vertical axis is productivity value, and the metric on the horizontal axis is time. The individual productivity values in corresponding reporting periods are plotted on the chart to create a time-series plot of productivity values for corresponding reporting periods. Since a portion of the data points may fall out of the control limits, they are eliminated; and the control chart is reapplied with a recalculated center line and control limits. The process repeats until no points fall out of the control limits. Then the mean productivity of the points falling within the control limits after the last iteration is used to define the baseline productivity level.

This method would return a meaningless baseline close to the mean, and no productivity loss can be reported. In this case, it is counterintuitive. A control chart is plotted for the 15” VCP installation data in the case study, as shown in Figure 2. It can be seen that no points fall out of the control limits, and Gulezian and Samelian’s method cannot even find a baseline for this case study.

**Applying Ibbs and Liu’s K-Means Clustering Technique Based Procedure**

In an attempt to address issues in Thomas’s procedure, Ibbs and Liu proposed a K-means clustering based method to separate the productivity data into different groups [2]. K-means clustering is a method of cluster analysis, which aims to partition observations into K clusters in which each observation belongs to the cluster with the nearest mean. Although Ibbs and Liu did not clearly specify how to determine the value for K, they appeared to allude to K equaling 2 for their procedure. Ibbs and Liu’s procedure can be summarized as follows:

1. The two cluster centers are first set to the highest and lowest productivity among all the reporting periods.
2. The distances to the two cluster centers are calculated for each reporting period, and the reporting period is assigned to the cluster to which it is closer.
3. Calculate the mean for each of the two clusters. If it is different from the cluster center, the cluster center is updated by it, and go to 2; otherwise, go to 4.
4. The cluster with higher productivity is then the baseline set, and its cluster center is determined to be the baseline productivity.

Using the K-means clustering technique, the productivity data can be divided into two clusters, good and bad. The good productivity cluster, which may not be continuous in time, is the baseline subset determined by Ibbs and Liu’s method and the mean of the baseline subset is then selected as the baseline productivity. This method will always include the best reported productivity in the baseline subset, whether or not it is attainable and sustained.

Another flaw in using the means clustering based method to identify a productivity baseline is the presence of multiple solutions even with the same K value [13]. Different solutions sometimes can be reached from different initial conditions, which may create hurdles to resolve a productivity loss claim, especially when different commercial software packages are employed to perform the K-means clustering.
clustering calculation by the opposing parties.

The application of Ibbs and Liu’s K means clustering procedure to the 15” VCP installation case study is demonstrated in Figure 3. First, the maximum and minimum productivity values are chosen as the initial cluster centers. The initial cluster centers are 2.50 hr/lf of Day 35, and 9.09 hr/lf of Day 30. Starting from Day 1, the distances to the two cluster centers are calculated for each day, and it is assigned to the cluster the center of which it is closer to. After this step, all the workdays with a productivity value no less than 5.56 hr/lf have been assigned to the upper cluster, and the others are in the lower cluster. The cluster centers, calculated as the mean productivity of the cluster, are 3.78 hr/lf and 7.48 hr/lf, respectively. Then the step of distance calculation and assignment for each workday repeats, until the cluster centers between two iterations remain the same. In this case, the calculation stops at the second iteration, with the final cluster centers being 3.78 hr/lf, the baseline productivity, and 7.48 hr/lf.

**Applying Zhao and Dungan’s Improved Baseline Method**

In order to address the weaknesses in the above methods, Zhao and Dungan proposed the IBM, published in the Journal of Construction Engineering and Management [13]. In the IBM, the baseline subset is defined as the periods or sections where the productivity reflects the contractor’s normal operating performance, or the productivity that is attainable and sustained. The baseline subset does not have to be continuous in time. There are two basic steps to determine the baseline productivity:

- Step 1, use the overall average productivity to divide the data into two groups, the good productivity group (GPG) and the bad productivity group (BPG) In lost productivity claims, the establishment of the cause and effect relationship is one of the most important steps. The causal relationship between disruption and productivity governs the extent that lost productivity can be proven. It is generally accepted that with other conditions kept the same, the more heavily the construction is impacted, the worse the productivity would be. Good productivity is normally experienced where there are either no disruptions or light disruptions. Therefore, it is a reasonable assumption that the productivity experienced in the periods/sections without any assignable disruptions or with light disruptions is generally
better than the overall average productivity.

- Step 2, refine the baseline subset from the good productivity group using statistical techniques. Zhao and Dungan [13] used a revised control chart technique by adopting the average productivity as the center line instead of the arithmetic mean of the individual productivity values from different reporting periods/sections, which can address the production differences among reporting periods/sections. Contemporaneous project information is useful to refine the selection of productivity baseline.

The IBM is applied to the example. The overall average productivity for this example is 4.09 hr/lf. All the work days on which the productivity is less than 4.09 hr/lf are assigned to the GPG, which is summarized in Table 2, and the remainder is then assigned to the BPG. Then the revised control chart technique applied to the GPG. The average productivity and standard deviation for the initial control chart data set are calculated to be 3.41 hr/lf and 0.48 hr/lf respectively. Correspondingly, the LCL is 1.96 hr/lf while the UCL is 4.86 hr/lf. As demonstrated in Figure 4, the calculation stops because no extreme points need to be eliminated. Therefore, the baseline subset contains 21 data points (reporting periods), the same as the GPG, and the baseline productivity is 3.41 hr/lf.

In the IBM, the first step significantly narrows down the range for the data set that contains the baseline subset. Even without the second step, the first step would provide a reasonable approximation for the baseline productivity. The second step is for fine-tuning purpose to eliminate extreme data points, which do not represent the contractor’s normal productivity from the GPG. Some of the extreme data points may be caused by clerical errors, data update delays, or the inclusion of dissimilar work and/or assignable disruptions on some data points.

**Considerations for the Build-Up and Tail-Out Effects**

Productivity is commonly impacted by the effects of build-up and tail-out during construction. In Zink’s procedure, the first and last 10 percent of the reporting periods are deleted as a result of the effects of build-up and tail-out. There is, however, no evidence that 10 percent is a reasonable percentage. In some instances, the productivity decline at the end of construction may be because of the come-back work attributable to the owner, and thus it may not be reasonable to impose an arbitrary tail out period. In this article, the following rules are proposed to eliminate the use of the arbitrary figure of 10 percent for the cases without any other assignable causes at the beginning and end of construction:

- If some of the first 10 percent reporting periods are members of the GPG, the build-up effect should end before the earliest of them. In other words, once the productivity reaches the normal level, the build-up effect is deemed to have been overcome.
- If some of the last 10 percent reporting periods are members of the GPG, then the tail-out effect should not start until after the latest of them.

The explanation is that if a reporting period is in the GPG, it and its successors should not be in the build-up period; similarly, it and its predecessors should not be in the tail-out period, because the productivity reaches a level near the normal operating process and the effects of build-up and tail-out can be neglected.

Although it is not uncommon that build-up and tail-out effects are encountered during construction, the rule of thumb to use 10 percent should not be considered as a general rule, as those effects vary from project to project. The duration and impact of those effects for a project should be determined based on the cause and effect analysis specifically for that project.

For the case study, the data points of day one and day 35 are in the GPG. According to the proposed rules to identify the build-up and tail-out periods, the build-up and tail-out effects can be ignored in this case study because the productivity of days one and 35 are within a range of normal operating performance.

**Conclusions**

This article has compared various methods to perform the measured mile/baseline calculation through a case study, in which the advantages and weaknesses with the existing methods are demonstrated:

Zink’s method was the first systematic procedure to determine the measured mile. It requires the measured mile to be impact free and continuous in
time, which may not be applicable in many projects. The 10% build-up and tail-out periods are arbitrary and the details for selecting the linear or near linear portion that represent the most efficient rate of progress have yet to be refined to reduce subjectivity.

Thomas made great contributions to the improvement of the measured mile methodology by introducing the baseline concept, which overcomes the restrictions of impact free and continuously measured mile. But Thomas’s procedure selects baseline using production instead of productivity, and includes the arbitrary 10 percent requirement for the baseline sample size.

Gulezian and Samelian’s method is a useful tool to identify extreme data points. When the productivity value of a reporting period falls out of the control limits, it can be viewed as unusual compared to all others that are within the control limits. However, when the majority of the reporting periods experienced disruptions, it is not surprising to expect that no data points would be beyond the control limits, like the case study in this paper. Therefore, Gulezian and Samelian’s method may not work well for the cases with pervasive disruptions throughout the reporting periods.

Ibbs and Liu’s method uses the K-means clustering technique to divide productivity data into two groups, “unimpacted” and “impacted.” As reported in the literature [13], there could exist multiple competing productivity baselines using K-means clustering technique. This certainly would undermine an objective analysis. Ibbs and Liu’s method did not evaluate whether the data in the baseline set falls in contractor’s normal productivity range.

Zhao and Dungan’s IBM not only combines the advantages of the above methods, but also avoids their weaknesses. It does not require a continuous, unimpacted period for the baseline subset which is similar to Thomas’s and Ibbs and Liu’s methods. But the definition of the baseline set is revised to be the periods in which the productivities reflect the contractor’s unimpacted or least impacted normal operating performance to eliminate the inconsistency between baseline definition and method implementation in Thomas’s method.

Since a unique baseline subset is determined using impartial, basic statistical techniques, the IBM is more objective than other methods. The productivity data are first divided into two groups, the GPG (which could be used as a reasonable quick approximation for the baseline) and BPG, according to the overall average productivity value, and then the GPG is refined to be the baseline subset by eliminating the extreme data points.

In the IBM, the sample size of the baseline subset is not decided by an arbitrary percentage; it relies, instead, on the characteristics of the productivity data itself. This is similar to Ibbs and Liu’s method, but the IBM’s solution on the baseline productivity is unique which is different from Ibbs and Liu’s method. Further, the IBM eliminates extreme data points that do not represent the normal operating performance, while Ibbs and Liu’s method does not.

As presented above, this article discussed various methods to help determine the measured mile for productivity analysis, especially on projects where the measured mile is not readily observable. Each of the methods has its underlying premises and assumptions. Applying these procedures without considering the underlying premises and assumptions may lead to erroneous measured mile calculation. Further, a cause and effect analysis is still needed to establish the causal link between the disruption and declined productivity, and verify that the measured mile determined by those methods is reasonable. ◆

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The Six Principles of Successful Workplace Negotiation

Dr. Robert Cialdini

No matter what your job title, chances are you engage in workplace negotiations every day. Being able to successfully negotiate with others is essential for success. Researchers have identified six fundamental principles of persuasion that do not involve the merits of the proposal but rather the way in which you communicate them. When you understand and use these principles ethically, you, too, can become a more effective negotiator.

- **The Principle of Reciprocity**—People tend to give back to others what has been given to them. For example, when participating in a conversation or discussion, by providing others with attention, information, concessions, and respect, you will likely receive the same from them in return. In order to maximize the Principle of Reciprocity in a negotiation, you should be the first to “give,” and be sure what you give is personalized and unexpected.

- **The Principle of Scarcity**—In a workplace negotiation situation, it’s important to describe the unique, or otherwise unattainable advantages of any recommendation or offer you make. However, research shows that in situations marked with uncertainty, people are more apt to take action when they know what they stand to lose, rather than what they could possibly gain. Therefore, when negotiating, it’s important to not only tell people the benefits they’ll gain, but also what they could lose if they don’t move in your recommended direction.

- **The Principle of Authority**—Research shows that people typically follow the lead of those they perceive as credible and knowledgeable experts. Unfortunately, many experts mistakenly assume that others will naturally recognize their expertise. For maximum impact, arrange to have a third party communicate your expertise. Another option is, before you ever start negotiating, to provide the person you want to influence with articles about your expertise.

- **The Principle of Consistency**—When someone makes a commitment actively, it’s even more likely that they’ll follow through with that commitment. When negotiating, you can activate the Consistency Principle by recognizing a prior commitment and linking it to your current request. If possible, take it a step further by getting the commitment in writing, because people tend to live up to what they write.

- **The Principle of Liking**—Science tells us there are three important factors that contribute to likeability: 1) we like people who like us (and tell us so); 2) we like people who are similar to us; and 3) we like people who cooperate with us toward mutual goals. Therefore, when negotiating, take the time necessary to locate genuine shared interests and points of agreement before delving into your idea, proposal, or recommendation.

- **The Principle of Social Proof**—People often rely heavily on others for cues on how to think, feel, and act. This tendency to look to and follow the lead of similar others is strongest in situations with uncertainty. To use Social Proof effectively in a negotiation situation, rather than trying to demonstrate it yourself, it’s important first to present testimonials from others that are similar to your fellow negotiator. The more similar the testimonial providers are, the stronger your case will be perceived.

INFLUENCE AT WORK (IAW®) was founded by Robert Cialdini, Ph.D, Professor Emeritus of Psychology and Marketing and author of the New York Times bestseller, Influence. ◆
The year 2016 marks the 40th anniversary of the establishment of the International Cost Engineering Council (ICEC). This milestone will be celebrated at the 10th ICEC World Congress being held in Rio de Janeiro, Brazil from 9-12 October 2016 (http://www.icec2016.com). The Congress will be preceded by the biennial ICEC Council Meeting on 8-9 October.

ICEC was founded in 1976 and is a not for profit organization that promotes cooperation between national and multinational cost engineering, project controls, quantity surveying, and project management associations around the globe. It is an umbrella organization that brings these associations together from around the world to network, share information and bodies of knowledge, raise professional standards, and provide a unified identity for the profession. ICEC’s membership currently comprises 42 professional associations spread throughout the world, collectively representing project cost management professionals located in over 100 nations. These individual professionals are all members of ICEC participant and affiliate associations, providing a tremendous international network of people, owner organizations, companies, and institutions.

The past 40 years has seen a tremendous growth in the development and recognition of the profession around the world. ICEC started out with four founding member associations and has now grown to over 40 member associations. AACE International was one of the four founding members, along with the UK Association of Cost Engineers (ACostE), the Dutch Association of Cost Engineers (DACE), and the Mexican Society of Engineering Economics, Financing & Costs (SMIEFC).

The story of the development of ICEC started in 1971, at AACE’s 15th Annual Meeting in Montreal, Canada. This was not the first time AACE had shown interest in international activity, although it was the first AACE annual meeting to be held outside the United States. In 1958, only two years after its formation, AACE established a Section in the United Kingdom. In turn, this Section transformed itself in 1961 into the UK Association of Cost Engineers (ACostE). By 1971, there were two other established cost engineering societies - the Dutch association (DACE), founded in 1953, and the Mexican Society (SMIEFC), founded in 1965 as a Section of AACE. AACE took the opportunity to promote cost engineering internationally and declared the 1971 AACE Annual Meeting, because of its location in Canada, the 1st International Cost Engineering Symposium. They invited the three other societies to submit papers and to be responsible for one complete track of the meeting. The conference in Montreal was the first truly international cost engineering congress. At that time, Chris Walker, then the President of ACostE, and Ken Humphreys, then the AACE Executive Director, discussed the possibility of forming an international organization. Subsequently, international congresses were held by SMIEFC in 1972 and by ACostE in 1974. These first three congresses were unofficial international events but, in each case, the four organizations which were at the first congress participated to varying degrees and the idea of forming an international organization gained momentum.

The idea took five years of planning and culminated in 1976 with the adoption of the ICEC Constitution and By-Laws and the formal creation of ICEC at the AACE Annual Meeting in Boston. There was finally an international organization for the sharing of technical knowledge and experience for the benefit of the profession worldwide. Chris Walker was elected as the first...
ICEC Chair and Ken Humphreys was elected as the first Secretary-General, a position he held for 30 years until the 2006 ICEC Congress in Ljubljana, Slovenia, when he stepped down and Peter Smith from Australia was elected to take on his role (a position he still holds).

Fast-tracking to 2016, AACE International continues its strong involvement in ICEC activities. Alexia Nalewaiik, AACE International member, is the current chair for the 2014-16 term. Previous AACE International members who have held the ICEC Chair position are: Henry Thorne (1984-86), Jamie Bent (1992-94), Allen Hamilton (1998-2000), and Ginette Basak (2006-08).

The key mission of ICEC is to help provide a global identity for the profession and improve professional standards across the globe by bringing cost management associations together to network, share information and knowledge, and collaborate on professional initiatives for mutual benefit. ICEC does not compete with anyone or any association; instead, ICEC focuses on supporting associations and bringing them together for the good of the profession. ICEC does not have individual membership but rather provides a global platform to promote and raise awareness of its member associations and member associations’ initiatives, which may encourage professionals to consider joining one or more of these associations. ICEC also promotes congresses, seminars, and other events being held by its member associations and raises awareness of the various publications, forums, certification programs, and other services that its member associations provide. For example, ICEC promotes the AACE International Annual Meeting, certification programs, forums, professional resources and technical materials such as the Total Cost Management (TCM) Framework to its global audience; these are held in high regard in the international community. ICEC maintains a calendar of local, regional, and global congresses, meetings, forums, and seminars, and reports on such events through the International Roundup newsletter. ICEC’s technical journal provides visibility of top technical papers from conferences around the world, with an affiliated awards program for student and practitioner papers.

Collaboration, shared language, unity, and visibility of the project cost management profession and their representative associations are the key for the global development of the profession. In addition to over 100 national organizations, there are now a number of global/regional professional associations that represent the interests of project cost management professionals and cooperate with ICEC, such as the Royal Institution of Chartered Surveyors (RICS), the International Federation of Surveyors (FIG), the African Association Of Quantity Surveyors (AAQS), the Pacific Association of Quantity Surveyors (PAQS), and the European Council of Construction Economists (CEEC). Other key organizations cooperating with ICEC include the International Project Management Association (IPMA), and the World Federation of Engineering Organizations (WFEO).

ICEC excels at amplifying the initiatives of member associations, providing critical mass and momentum by including participation by other member and affiliated organizations. Examples of recent initiatives include:

- The International Construction Measurement Standards (ICMS) coalition (https://icms-coalition.org/), which has brought project cost management associations together from around the world to develop a global measurement standard.
- Efforts to secure official recognition of the Quantity Surveyor/Cost Engineer in the Central Product Classification (CPC) scheme of the World Trade Organization (WTO)/Economic and Social Council (ECOSOC) of the United Nations.
- Development of common global standards, common bodies of knowledge and standard definitions/terminology.
- Development of AACE International Recommended Practices (public comment).
- Efforts to develop an ISO standard for project controls.

The profession lacks a truly global identity which is, in part, due to the variety of descriptors used for the profession such as cost engineer, quantity surveyor, construction economist, cost manager, project cost manager, project controls or the like. The lack of common standards, common bodies of knowledge and standard definitions/terminology further restricts the profession. Large global entities such as the United Nations, European Union, the World Bank, the International Monetary Fund and other statutory bodies typically require International Standards, International Certification, and International Accreditation. The profession is very fragmented on a global scale and needs to come together to work toward global goals and recognition.

There is also a disparity between the expertise, competency levels and cost management practices provided across the globe. Cost management services provided in some developing countries and in countries where the profession is not traditionally recognized lag behind that offered in countries where the profession is well established, such as in the United Kingdom and the United States. The absence of common global standards and certification programs and the lack of sharing of knowledge are major contributors to this problem. ICEC is creating parity for the profession, through the accreditation of member institution certification programs, establishment of a baseline expectation for practitioner expertise, benchmarking of core competencies, and mapping of bodies of knowledge.

Tremendous achievements in the development of the profession are being realized around the world. The emergence of the cost engineering profession in China provides the most striking change in the global profession in recent times. The profession was formally established by the Chinese government in the late 1990s, and formal registration programs were introduced in 2000. The total number of people working in the cost engineering field in China is now estimated to be approximately 1.5 million, with over 800,000 professionals having achieved certification/recognition in the cost engineering field. This rapid development of the profession in the world’s most populous country in such a short space of time is quite remarkable.

The Africa Association of Quantity Surveyors (AAQS) was established in 1999 to help develop the profession in Africa and currently comprises 16 national quantity surveying associations from around Africa. They are doing a lot of collaborative work that has included the development of model documentation and an Africa Standard Method of Measurement.

The explosion of growth of the profession in South/Central America continues to build. The Brazilian Institute of Cost Engineering (IBEC) has paved a significant course for the profession through the development of their cost engineering certification program tailored to suit not only Brazil, but also the South, Central, and Latin American regions with translations in both Por-
tuguese and Spanish. Recognition of the profession has been furthered by the establishment of the annual Brazil National Cost Engineering Day by government legal statute, enabling promotion of the profession throughout the region. IBEC continue to meet and collaborate with engineering associations from throughout the region, including: Argentina, Aruba, Belize, Bolivia, Brazil, Chile, Colombia, Costa Rica, Cuba, Guatemala, Honduras, Jamaica, Mexico, Panama, Paraguay, Peru, Puerto Rico, Uruguay, Venezuela and other countries. The development of the profession in the region is also being strongly supported by AACE International, IPMA, and RICS.

The staging of the ICEC World Congress in Rio de Janeiro, Brazil this year is well timed to build on these developments. The Congress hosts, IBEC, have been working on and marketing the event since being awarded the hosting rights in 2012, so preparations are well advanced with a perfect blend of professionalism, enthusiasm, and passion. A number of high profile keynote speakers have been lined up and the event promises to be one of the best attended ICEC World Congresses on record. Delegates are also welcome to attend the ICEC Council Meeting being held prior to the congress – this meeting is held every two years and forms the main decision making forum for the organization. This provides further opportunity to meet and network with the ICEC executive officers and delegates from ICEC member associations around the world.

ICEC invites all AACE International members to attend the ICEC World Congress this October, in Rio de Janeiro (http://www.icec2016.com).

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**Hashtagging Your Way To Social Media Relevance**
*Those Seemingly Inconsequential Hashtags Are Crucial To Gaining More Exposure For Your Brand*

Jay Work

Not so many years ago, many people probably paid little attention to that pound sign on the computer keyboard. Then along came Twitter and what we have come to call the “hashtag,” and social media marketing was changed forever.

When you are on social media sites, your goal should be to become part of the conversation. The hashtag allows more people to find your contributions to that conversation. Without them, you miss out on lots of eyes that could be viewing your content.

For example, let’s say 1,000 people follow you on Twitter. Not counting re-tweets, only 1,000 people will see your posts if you don’t use a hashtag. Add the hashtag, though, and you start picking up momentum because the post has the potential of being seen by, and re-tweeted by, any number of people.

But be warned. While there are great benefits to hashtags, there also are pitfalls. Hashtags don’t come with exclusivity. Anyone can use them, so a hashtag can become a weapon that works both for you and against you. Critics of your brand, or just the usual assortment of Internet trolls, may attempt to hijack your hashtag, putting you or your business in a bad light.

March boldly into hashtagging, but as you do keep in mind these suggestions for getting the most out of your efforts.

- **Use Proprietary Hashtags**—One of the advantages to a proprietary hashtag, such as “Orange is the New Black’s” hashtag #OITNB, is that it is linked directly to your brand. These hashtags typically are not used as widely as a more generic hashtag, but the goal is to brand yourself through the hashtag with the hope it could go viral.

- **Don’t Overdo It**—A post littered with too many hashtags can be difficult to read, so your message might become obscured as your followers see what appears to be gibberish. Perhaps you saw the skit Justin Timberlake and Jimmy Fallon once performed in which they spoofed the device’s overuse by lacing their spoken conversation with seemingly endless hashtags. It was hilarious and annoying all at the same time. Twitter itself suggests using no more than two hashtags per Tweet. Certainly, three should be the very maximum on Twitter. A different etiquette exists on Instagram, though, and most Instagram followers will tolerate excess hashtags. Meanwhile, although hashtags can be used on Facebook, there’s little reason to include even one. That’s not the way people use that social media site.

- **Think Geographically**—If you are a local company that depends mainly on local clientele, a hashtag that links to your location works well. Hashtags such as #Seattle or #Bangor drop you into numerous conversations about your hometown.

Since social media has become such a vital element of any comprehensive marketing strategy, understanding all of the nuances is critical.

A hashtag may not look like much, but it’s really a powerful tool that is a double-edged sword. If used correctly it can greatly bolster your marketing reach. Used incorrectly, it can have adverse effects or unintended consequences.

With social media, your hashtag is your brand, so use it wisely.

Jay York, senior digital marketing strategist for EMSI Public Relations (www.emsincorporated.com), is an internet marketing expert with extensive experience in social media marketing dating back to the early days of MySpace and LiveJournal.
COMP is a comprehensive package of benefits designed to encourage companies to develop the skills of their total cost management employees through AACE membership.

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UPCOMING AACE ANNUAL MEETINGS

• 2017 Annual Meeting - June 11 - 14
  Hyatt Regency      Orlando, Florida, USA

• 2018 Annual Meeting - June 24 - 27
  Manchester Grand Hyatt      San Diego, California, USA

• 2019 Annual Meeting - June 16 - 19
  Sheraton      New Orleans, Louisiana, USA
**Central Texas Section**

The Central Texas Section worked closely with the Associated General Contractors (AGC) to host a joint meeting. There were 16 in attendance. The most widely used scheduling technique is the Critical Path Method (CPM) for scheduling, often referred to as critical path scheduling and this was the meeting topic. This method calculates the minimum completion time for a project along with the possible start and finish times for the project activities. Indeed, many texts and managers regard critical path scheduling as the only usable and practical scheduling procedure.

Attendees heard about the following:

- Development and requirements to make a successful CPM schedule.
- The importance of understanding what the critical path is on your project.
- Identifying what the critical path is and what it means.
- How float is generated and used to help manage a critical path.
- Understanding the mitigation constraints of near critical path activities.

**East Tennessee Section**

The East Tennessee Section conducted a lunch time section meeting on May 24, in Oak Ridge, Tennessee at the Gondolier Restaurant. The guest speaker was Mark Watson, Oak Ridge City Manager. Approximately 20 members and guests attended the luncheon.

Mr. Watson discussed several current and recently completed infrastructure improvement projects throughout the City of Oak Ridge. He worked some project management and cost and schedule anecdotes into the presentation. He also answered several questions from attendees. And, since several East Tennessee Section members live in Oak Ridge, Mark’s information garnered more than just a passing interest from start to finish.

Submitted photo

*Oak Ridge, Tennessee City Manager, Mark Watson (at left) accepts a guest speaker gift from East Tennessee Section Secretary, Chad Miller CCP.*
Houston Gulf Coast Section

The May 10 presentation was Houston Gulf Coast Section’s final meeting of the 2015-2016 program. Vijai Singh, Manager/Principal Consultant at Rider Hunt International presented how 3D engineering models and data can be used with a unit rate approach to assist the project in accelerating the estimate development process. Transparency and accountability are the heartbeat of project controls and contract management.

Vijai included a short video on how data is entered into RHiComs™ and how earned value is calculated. RHiComs™ unit rate contracting estimating and support software is a computerized bill of quantities and schedule of rates system.

April was another busy month for the Houston Gulf Coast Section. For four consecutive weeks, HGCS board of director members volunteered to teach project controls 101 Class. The attendance was great with approximately 50 people attending each night. Jacobs Engineering graciously allowed the section to use one of their training rooms. The attendees interacted with the instructors to get full value of the class. Another HGCS success!

At the end of the class, HGCS presented Jacobs Engineering a special certificate of appreciation and a gift. Special thanks to Yemi Ibiyemi for the photos.
North Florida Section

The North Florida Section recently presented its annual “You’re a Star” Award to Marlene Hyde, CCP EVP, at the December 2015 Section meeting. Marlene has been an AACE member since 1993, and has previously served in many leadership roles on the AACE Section and international levels. She has been a North Florida Section member for several years, during which she has served as Vice President-Technical helping to find speakers, and as one of our Board Directors.

She has also more recently served on the Certification Seminar Committee, helping to plan the Section’s first PSP Certification Preparation Seminar. She has been a speaker at the Section meetings, and is an important resource on the international level.

The award winner has also contributed significantly to AACE International as a whole, thus positively impacting all Sections. Most notably, she completed her term as President of AACE International in July 2014. Prior to this, she was the International Vice President of Finance 2006-2008 and also served several years on the International Certification Board. She has been an AACE member for over 23 years, and was recently awarded an AACE Fellow designation. She has over 35 years’ experience creating and auditing schedules, costs, and earned value systems on large construction and environmental projects in US, Canada, and in the Middle East. She also does independent consulting and is supporting the Department of Homeland Security on environmental liability audits and the Department of Energy on costs for nuclear facilities, and has worked on projects ranging from $50 million to $5 billion. She has a master’s degree in Civil Engineering specializing in construction engineering and management, and is a Certified Cost Professional (CCP) and an Earned Value Professional (EVP).

AACE has benefitted greatly from her professional experience, dedication and leadership, plus her valuable and timely assistance to our programs and activities. Her active participation and enthusiasm are always welcome at our meetings and have certainly made a positive difference for our Section and for AACE as a whole. The Section was proud to present Marlene with the 2015 North Florida Section’s “You’re a Star” Award, and section members offer their sincerest congratulations.

Southern California Section

The June dinner meeting of the Southern California Section was on Thursday, June 16. The presentation was titled: The Plan - The Waterfront Redondo (CenterCal Properties). The speakers were: Steve Hanna, Senior Vice President of Construction at CenterCal Properties and John Thornton, Executive Vice President at Layton Construction.

Mr. Hanna brings more than three decades of construction experience to the CenterCal team and has worked on both the general contractor and the developer side of the development equation on some of the finest mixed-use projects in the industry.

Mr. Thornton’s Layton Construction recently ranked as the 57th largest construction company in the United States according to ENR Magazine with revenues exceeding $1.1B. Mr. Thornton is responsible for total customer satisfaction while overseeing the construction of the company’s retail, entertainment, hospitality, office and industrial projects in Southern California. His past clients include Macy’s Department Stores, St. Regis Resorts, JCPenney, Sears, Target, Bass Pro Shops, Whole Foods Market, Container Stores, Disney, Coca Cola, Universal Studios, Knott’s Berry Farm and numerous public and private institutions. The meeting was at the CenterCal Properties, 1600 E Franklin Ave, El Segundo, CA 90245.

In April, the Houston Gulf Coast Section sponsored a Project Controls 101 Class. Shown above Brian Bedingfield and Julianne Roberts, HGCS Directors, presented a session on Planning & Scheduling.
When Will Your Section News Submission Be Published?

The digital Source magazine includes all “Section News” submissions. Source has a submission deadline of two months in advance of the issue date. Please review the following production schedule. It lists the submission periods for the six bimonthly issues of Source magazine in 2016.

2016-2017 Source Section News Submission Schedule

February 2016
• Items submitted from Oct. 15 - Dec. 15, 2015

April 2016
• Items submitted from Dec. 15 - Feb. 15, 2016

June 2016
• Items submitted from Feb. 16 - April 15, 2016

August 2016
• Items submitted April 16 - June 15, 2016

October 2016
• Items submitted June 16 - Aug. 15, 2016

December 2016
• Items submitted Aug. 16 - Oct. 15, 2016

February 2017
• Items submitted from Oct. 16 - Dec. 15, 2016

April 2017
• Items submitted from Dec. 16 - Feb. 15, 2017

June 2017
• Items submitted from Feb. 17 - April 15, 2017

This production schedule is based upon production schedules at AACE headquarters, as well as our printer having two to three weeks production time to take our in-house files and convert them to the Nxtbook software for posting. Enhanced features like audio, video, website links, and more will be a part of each issue of the Source. Some technology features will require additional production time and earlier deadlines. The magazine is to be ready for posting by the first of the month.

Within 2 to 3 business days of submitting a “Section News” items, you should receive a return confirmation e-mail that your submission was received at AACE headquarters.

How to Submit Text and Photos

Please submit any and all text as a part of the e-mail or as a Microsoft Word file attachment. Please submit any photo or photos as individual attachments in tiff or jpg formats. Do not embed photos in Microsoft Word files.

For photos to be used, we require either large original files or print size photos at 300 dpi (dots per inch). We can convert large 72 dpi submissions into the required 300 dpi. This process shrinks the size of the original submission. We cannot use photos taken on cell phones. For photos to be published, they must be in focus, of print quality, and wide enough to fill the width of the column layout.

Please include the names and titles of each person shown in any photos. Please list names from left to right or refer to those shown as being above left or right. For group photos please list names from left to right, beginning with the front row and working to the back. Do not list the Section officer first unless he or she is photographed on the left with guest speakers on the right.

All submissions should be e-mailed to editor@aacei.org. Please use the official name of the Section as approved by the AACE Board when the Section’s charter was approved. Never refer to the Section as a chapter.

Contact AACE Concerning Missing Submissions

Generally, all submissions received in the above scheduled times will be published in the listed issue. Items are not held because of space restrictions. There is no waiting list and no preference is given to one Section over another. Questions about incomplete submissions or failure to follow these submission guidelines could delay publication. Text will be published without submitted photos if the photo does not meet the listed quality requirements.

If a submission is not included in the designated issue, please e-mail or call the Managing Editor to ensure that it has not been lost or misplaced. Call or e-mail if you do not receive a confirmation e-mail within 3 business days of submission.

AACE reserves the right to edit all submissions and/or to refuse to publish any submissions determined by the Managing Editor or the Art Director to not meet the standards of the journal. Any appeals of these decisions will have a final decision determined by the Executive Director.

Any Section representative with questions is advised to e-mail editor@aacei.org or call the Managing Editor during regular business hours (9 a.m. to 5 p.m. Eastern Standard Time, Monday-Friday, except holidays and special closings.]
Skills and Knowledge of Cost Engineering, 6th Edition
Dr. Makarand Hastak, PE CCP, Editor, 2015
This publication provides information on a wide range of cost engineering subjects and will prove to be a valuable resource to any individual seeking professional growth or pursuing an AACE International certification. This publication offers six sections comprising 34 chapters of content on topics such as cost estimating, project planning, value engineering, and strategic asset management, to name a few.
Digital Download - US$80.00 member/US$120.00 nonmember
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CCP Certification Study Guide, 2nd Edition
Dr. Makarand Hastak, PE CCP, Editor, 2016
The AACE International CCP Certification Study Guide, 2nd Edition is designed as a companion workbook to the Skills and Knowledge of Cost Engineering, 6th Edition (S&K 6). In conjunction with S&K 6, this study guide will assist individuals in their preparation for the CCP Certification examination and develop the general knowledge a cost engineering professional is expected to have. This study guide offers insight into the key topics found in each chapter of S&K 6 and provides practice questions and exercises to develop knowledge in individual areas.
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Peter W. Griesmyer, Editor, 2008
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EVP Certification Study Guide, 3rd Edition
Sean T. Regan, CCP CEP FAACE - Editor, 2015
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The Total Cost Management Framework, 2nd Edition
H. Lance Stephenson, CCP FAACE, Editor, 2015
The TCM Framework is a structured, annotated process map that explains each practice area of the cost engineering field in the context of its relationship to the other practice areas including allied professions. It provides a process for applying the skills and knowledge of cost engineering.
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This CD-ROM is an important reference for any project or cost professional. It includes data and procedures related to basic skills and knowledge that all cost engineers should possess, extensive material on capital and operating cost estimation, and papers in four subject areas: cost control, planning and scheduling, project management, and economic analysis and business planning.
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AACE International Recommended Practices
Cost Engineering Terminology; Cost Estimate Classification System; Estimate Preparation Costs in the Process Industries; Project Code of Accounts; Required Skills and Knowledge of a Cost Engineer; Roles and Duties of a Planning and Scheduling Engineer; Profitability Methods; plus many more.
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2016 AACE International Transactions
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- US$115.00 nonmember
For CD-ROM version please contact AACE International Headquarters

more online at www.aacei.org
**AUGUST 2016**

4  **CMAA Seminar: What Owners Want from CMs,**
The Southern California Chapter of the Construction Management Association of America (CMAA),
The LA Hotel, Los Angeles, Los Angeles, CA
Contact: www.cmaa.org

7-9  **IFRS-Based Accounting for Oil and Gas,**
Mobility Oil & Gas Limited,
Dubai, UAE
Contact: training@mobilityoilandgas.com

18  **CMAA Dinner: LA County Metro Transportation Authority Capital Program Update,**
The Southern California Chapter of the Construction Management Association of America (CMAA),
The LA Hotel, Los Angeles, Los Angeles, CA
Contact: www.cmaa.org

25-29  **Tech Expo 2016,**
The Southern California Chapter of the Construction Management Association of America (CMAA),
The Grand Event Center, Long Beach, CA
Contact: www.cmaa.org

**SEPTEMBER 2016**

1  **ACostE Council Meeting,**
The Association of Cost Engineers (ACostE),
IChemE London Office, London, UK
Contact: www.acoste.org.uk

7-9  **Construct 2016 Conference and Trade Show,**
Informa Exhibitions,
Austin Convention Center, Austin, Texas
Contact: www.constructshow.com

12-14  **IFRS-Based Accounting for Oil and Gas,**
Mobility Oil & Gas Limited,
Dubai, UAE
Contact: training@mobilityoilandgas.com

22  **CMAA Seminar: Change Orders Best Practices,**
The Southern California Chapter of the Construction Management Association of America (CMAA),
The LA Hotel, Los Angeles, Los Angeles, CA
Contact: www.cmaa.org

**JUNE 2017**

11-14  **AACE International’s 2017 Annual Meeting,**
AACE International,
Hyatt Regency Orlando, FL
Contact: phone 1-800-858-COST
fax (304) 291-5728
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www.aacei.org

Please submit items for future calendar listings at least 60 days in advance of desired publication.

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