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From a high vantage point, you gain insights into the big picture. In the same way, EcoSys EPC delivers a strategic set of tools to gain visibility into your project portfolios, to improve capital planning, and to achieve the flexibility to adapt as long-term plans meet the world’s constant state of change. Then in the very same software, drill down to make sure your project performance has...the right stuff.

Learn more about EcoSys EPC, the industry standard for enterprise project controls software. ecosys.net/therightstuff
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.

With fantastic new maps that show interactive, visual representations of urban fragility, Robert Muggah articulates an ancient but resurging idea: cities shouldn’t just be the center of economics -- they should also be the foundation of our political lives. Looking around the world, from Syria to Singapore to Seoul and beyond, Muggah submits six principles for how we can build more resilient cities. “Cities are where the future happens first. They’re open, creative, dynamic, democratic, cosmopolitan, sexy,” Muggah says. “They’re the perfect antidote to reactionary nationalism.”

Source: www.ted.com

CLICK to watch Robert Muggah talk about “The biggest risks facing cities — and some solutions” presented by TED.
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The Top 10 Reasons To Join AACE International

Ready to advance your career and begin enjoying the advantages that our members enjoy? Whether you are an experienced cost engineer or a student, we have a membership ready for you.

1. 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!

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

3. 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.

4. 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.

5. 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 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.

6. Technical Development
   Increase your knowledge and expertise by joining one of AACE International’s many technical subcommittees, subcommittees, and Special Interest Groups (SIGs) 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.

7. Networking
   By attending a local section or our Annual Conference & Expo 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.

8. 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.

9. Discounts
   On products and services ranging from AACE International Conference & Expo registration fees, archived webinars and presentations, certification examination registrations, and more!

10. You!
    We are your professional partner bringing you information and support you can trust. Join and become part of a unique network of individuals who are dedicated to improving the cost and management profession.

JOIN TODAY! web.aacei.org
The continuing interest in and global growth of AACE International’s (AACE) membership is very exciting. There is much energy coming from the international communities, with our newest Section in Bolivia, South America, recently being chartered. There is also much activity in Eastern Europe, Africa, and Central and East Asia with promise for new Sections. At our fall 2017 Board of Directors meeting, the Board recognized the need for further improvements in our governance structure to better respond to AACE’s members in two areas – Membership and Marketing. To that end, and through a strenuous strategic planning exercise, the Board set out to establish two new Associate Boards to provide additional agility and the opportunity for continuing innovation in support of our members. These two new Associate Boards are the Marketing Associate Board and the Membership Associate Board.

The Marketing Associate Board will steward AACE’s brand and image, assure the Association maintains a proactive, focused marketing effort both short-term and long-term for AACE’s portfolio of products and services including, but not limited to, membership, events, certification, technical products, and education, with programs that are consistent and have clearly defined objectives to enhance the reputation and recognition of AACE.

The Membership Associate Board, comprising the existing Regional Directors and Vice Presidents for North American and International Regions, will be focused on grass roots membership development and includes the fostering of new Sections and Regions. The ability of this group to operate more closely with membership at the regional and Section levels will provide improved agility and responsiveness. The function of the Membership Associate Board will promote the growth of global membership in the Association. The Membership Board shall develop strategies for membership acquisition and retention at the section, region, and international levels. The Membership Board is responsible for overseeing section health and section compliance with standards. Additionally, the Membership Board will seek to increase membership and engagement with various groups including students, young professionals, government, corporations, and owners.

To affect these exciting changes requires that we modify the Constitution and Bylaws of AACE International. This type of modification to our governance approach...
requires the participation of our Members through a vote during the annual election process to amend the Constitution and Bylaws to establish the two new Associate Boards and make the other adjustments necessary to the size the Board of Directors and Executive Committee, and to provide the accompanying agility and opportunities to continue to innovate how we interface with our members.

I encourage all to review and consider these important changes, and to vote in favor of these actions directed toward sustaining AACEC International as the premier professional association for Total Cost Management.

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.

I encourage all to review and consider these important changes, and to vote in favor of these actions directed toward sustaining AACEC International as the premier professional association for Total Cost Management.
AACE International Conference & Expo is a live creative event jam-packed with technical sessions, an exhibition, networking, and opportunities to interact and meet the experts in the total cost management community. With 9 specialized tracks each day and over 120 workshops and sessions, regardless of your skill level, we have the right answer for you. #2018AACE will be held in the Grand Manchester Hyatt from June 24-27 and we guarantee this is the most fun you’ll have learning. But don’t take our word for it...

It was great to visit with our members that have applied their expertise and provided awesome technical papers, articles, and other publications as well as providing educational programs and inspiration to other members and potential members.

This is the best professional conference I have ever attended!
(I’ve been to about 20 throughout my career).

I had a great time and met some amazing people. Keep it up!
This was my first time and certainly not my last!

What You’ll Do at #2018AACE

Sessions & Workshops
120+ hours
We have 9 tracks - in areas like claims & dispute resolution, risk, planning & scheduling, IT, total cost management, estimating, and more - for you to pick and choose from.

Exhibition & Showcase
45+ exhibiting firms
Get answers and solutions to your most intense project controls-related questions direct from the cutting-edge leading solution and training providers in the field.

Networking & Special Events
We know that if you’re having fun, you’ll learn more, connect more, and get more out of your time at #2018AACE; which is why we have so many opportunities for you to socialize and meet new people.
Arabian Gulf Section Hosts AACE Vice President-Technical, Larry Dysert, CCP CEP DRMP

AACE International Vice President Technical, Larry R. Dysert, CCP CEP DRMP FAACE Hon. Life, visited the Arabian Gulf Section (AGS) on December 3-6, 2017.

During his visit, he met the Arabian Gulf Section President and Section members. He also conducted a presentation to students at the Imam Abdulrahman Bin Faisal University. He also met with Dr. Othman Al-Shamrani, the Dean of the Engineering College at the university Potential collaboration between the university and AACE International is being discussed.

Furthermore, Mr. Dysert also gave a presentation to SABIC Management and met the Saudi Aramco General Manager for Upstream Projects, Mr. Fahad Al-Ammari. The two discussed total cost management and opportunities to increase the membership of ACCE in Saudi Aramco.

In addition, some courtesy visits were made to the King Fahad University for Petroleum and Minerals (KFUPM). Mr. Dysert met with Environmental Design College Dean Adel Al-Dossary. Opportunities for conducting technical seminars for the students of construction engineering was discussed. Agreements were made with the Dean to allow the Arabian Gulf Section to present seminars to the students during the 2018 semesters.

All in all, the visit demonstrated the AGS management capabilities and caliber, which will also potentially increase the number of AACE members.

Finally, Mr. Dysert participated in the International Engineering Conference and Exhibition, organized by the Saudi Council of Engineers in Riyadh. Larry’s presentation titled, “Effective Control of Capital Projects – It Shouldn’t Be That Difficult,” was well received by the more than 140 conference attendees.
The Power of Praise

BY PENNY WHOOLERY Manager, Certification and Membership

The digital age has changed the way we interact with each other. Unlike our Game of Thrones friends (can you believe that ending!?), we no longer have to wait for carrier pigeons to deliver important messages.

The evolution of technology affords us the convenience of disseminating messages through the click or touch of a button – to one person, or to multitudes of people – instantly.

The Internet’s ability to easily connect people, despite distance or time constraints is remarkable. The world is now accessible to all of us; thanks to a bunch of cables and wires the world seems much smaller through the lens of the internet. With 24-hour a day, 7-days-a-week access, we can assume someone is always searching for something, browsing results, subscribing to networks, purchasing items, sharing content, and providing feedback.

Businesses of the 21st century must have an online presence to remain competitive, serve current customers and to reach would-be customers. While there may be numerous cases of gaining a new customer serendipitously, businesses are more likely to gain new customers through other satisfied customers.

In other words, word-of-mouth advertising is still king. This important facet is regularly presented in the form of customer reviews or feedback in today’s digital world (admit it, how many times did you proceed to make a reluctant purchase on Amazon because it has 5 stars from a bazillion reviewers?). As P.T. Barnum once said, “Nothing draws a crowd like a crowd,” – and luckily for us, today a crowd can include the world.

Our best efforts to create an advertising campaign or marketing strategy could never match the testimonials (feedback) from you – our certificants. If we want AACE to grow a new generation of certified cost management professionals and technicians, planners and schedulers, cost estimators, etc., share a few thoughts about why you pursued AACE certification, or how certification impacted your career, or how certification has helped your personal development and growth, or just share any positive anecdote about your personal certification experience? Read on, if your answer is yes.

From now until midnight, March 15, 2018, each testimonial received will be entered into a drawing for a chance to win both the 2017 and 2018 Full Annual Conference Session Recordings (a $1,700.00 value). The winner will be drawn at the March 17, 2018 Certification Board Meeting.

The collections are the recordings of the presentations given at the conferences, exactly as presented, with audio overlay of the slides as shown to the audience. Each collection typically contains about 70-100 hours’ worth of material on various topics. Each one of the presentations viewed will earn you 0.1 CEUs. The 2017 collection will be available immediately; the 2018 collection will be available later in the year, after the conference has concluded and the recordings have been formatted for distribution.

Click here to submit your certification testimonial.

Businesses are more likely to gain new customers through other satisfied customers. In other words, word-of-mouth is still king.
Veronica Tafich was born and raised in Saltillo, the capital city of the northeastern Mexican state of Coahuila, located about 258 kilometers west of the Texas border. Veronica obtained her bachelor’s degree in accounting with honors from the Monterrey Institute of Technology and Higher Education. Veronica’s mother, also a professional accountant, influenced her career’s choice. Veronica’s father, a chemical engineer, taught her the importance of education.

Veronica’s first project controls experience was working with environmental projects. She worked for a non-profit organization along with a team of biologists tracking grants and preparing accurate financial reports for the sponsors.

After immigrating to Canada as a professional skilled worker, and landing with big dreams, Veronica was hired by AltaLink, Alberta’s leader in the energy industry. She supported the team as a cost control professional for the construction of transmission and distribution major projects.

At that time, Veronica joined AACE International and as a member she has had access to great resources that helped her to refresh and improve her professional capabilities. Veronica says that the online library, which includes industry best practices as well as the magazines, have both been wonderful resources to have.

Veronica says that AACE International community is friendly and welcoming, is always willing to give a word of advice, and is passionate to talk about project controls. She has been attending the technical dinners at her local section in Calgary and this allows her to connect with colleagues and share great presentations and experiences.

To get an AACE International certification was an important goal for Veronica, this experience allowed her to confirm that she has the skills and knowledge to be successful. Additional to gaining certification, Veronica also gained lots of confidence.

Veronica believes now is her opportunity to give back, therefore, she is currently volunteering as part of the section board with the Chinook Calgary Section in supporting the section activities. Her initiative is to partner up with recruiting organizations in Calgary, inviting them to meet and network with the local members. This initiative has been well accepted. Veronica is executing this initiative and hopes that it is not only successful for the local section, but can also act as a bridge between professionals and companies in the challenging Calgary market.

At present, Veronica is working as a project cost controller at TransCanada and supporting the safe and reliable operation of oil and liquids pipelines. These pipelines supply and deliver North American crude oil into Canada and the U.S.

Veronica is always aiming to anticipate the team needs and to contribute with her skills, experience and positive attitude. Her greatest satisfactions are to be productive and to achieve results. She feels blessed to be part of a team that shares her professional values and that promotes a healthy and inclusive working environment. The culture created by the leaders facilitates the professional growth of the entire team and allows the employees to enjoy working in harmony.

After more than 20 years of working experience, Veronica recognizes that sometimes members of a team have different points of view. Thus, sometimes it is important to pause and assess the situation. Veronica says that if you want to grow and develop skills you need to find a good fit for you. It is like hiring a camel to work in
the tundra, its skills will be limited and constrained by the environment. But, if you hire a camel to work in the desert, it will achieve better and faster results.

Veronica will always remember her first Canadian mentors, Lou for always pushing her to become a better professional; Eoin for being a great role model and believing in her; and Michelle for being generous with her time and knowledge.

Veronica’s motto is to take the time to know yourself, what you want, and define your professional goals. Repeat this exercise often, because life is changing constantly. If you know what you want, the route to get there will be shorter. Also, it is important that you identify your working values and respect them. Always trust your feelings. Life is full of opportunities, don’t wait, life is too short. Always be your fabulous self.

“If you know what you want, the route to get there will be shorter.”
— VERONICA TAFICH

PT&C Names Andrew Reape President and CEO Atlanta

Project Time & Cost, LLC (PT&C) has named Andrew Reape, CCP, as President and Chief Executive Officer, following the retirement of Joseph McGonagle, who had served in that role since 2013.

Mr. Reape joined PT&C in 1993, initially managing all projects for the firm’s western region. This included performing cost engineering, project management, cost data research, planning and scheduling, cost control, quality control training, and developing cost models. He has also performed research for the U.S. Army Corps of Engineers to upgrade equipment databases, and authored a study on the project productivity impacts of working in various levels of personal protective equipment. Since 2006, he has served as the account manager for PT&C’s prime federal contracts, and for those on which PT&C participates as a subcontractor. In this role, he has served as an unbiased client advocate and as a point of escalation for issues with project performance or communication.

Prior to joining PT&C, Mr. Reape served in active duty as a construction officer with the U.S. Army, where he managed vertical and horizontal construction projects.

Mr. Reape earned an MBA from the University of Maryland and a BS in Industrial and Management Engineering from Rensselaer Polytechnic Institute. He is a Certified Cost Professional (CCP) through AACE International and is a member of AACE International. AACE extends its congratulations to Mr. Reape.

Founded in 1982, PT&C is a global leader in program and project management, construction management, cost and schedule management, earned value management and technology solution services. Owners, contractors and insurers turn to PT&C for services and solutions that deliver success on complex projects and programs. From initial planning to post-completion claims, or in response to catastrophes or natural disasters, PT&C provides independent, expert oversight and analysis to ensure control of scope, cost, schedule, risk and quality. Engineering News-Record has repeatedly ranked PT&C among the top program management and construction management firms. For more information about PT&C, visit www.ptcinc.com.

See more at www.RonWinterConsulting.com
For several years, AACE has been expanding its presence in China—after all this country has a vibrant domestic and world-wide economy, and could use assistance with cost control issues.

As other AACE Presidents have done, I accepted the opportunity to go to the Peoples Republic of China to explain AACE, develop new relationships, and reinforce existing ones. From Wednesday October 11th through Sunday October 15th, I met with various groups of Chinese professionals interested in AACE and what AACE has to offer. All the meetings were made possible through the efforts of Feng Shen, a member of our AACE China Task Force living in Shanghai, who formerly lived in Los Angeles; Zuoming Wu, former Secretary-General of China Engineering Cost Association (CECA); and Annabelle Wu of Shanghai Construction Development Association (SCDA).

After traveling for an eternity (San Francisco is 15 hours behind China), my wife, daughter, and I arrived in Beijing. The next afternoon, I gave a three-hour lecture with Feng Shen to the Beijing Arbitration Commission (BAC). The issue of arbitration is a growing method in China to resolve disputes for the same reasons it is often chosen elsewhere in the world. The presentation was in slide format, of which Feng translated, aided by the slide deck he had previously translated. The topic was, “Forensic Schedule Analysis: SCL-DDP and AACE RP29R-03.” There were approximately 100 people in the audience and they asked questions that often related more to legal procedure that the technical aspects of the presentation. It is clear that timely performance is as much an issue in China as it is everywhere.

After the presentation, I had dinner with some members of the BAC and a local project management consulting company. Construction consulting is in its infancy in China, as many of the developers and construction companies are partially owned by the government. In fact, much of the construction management expertise resides in the developers’ organization, rather than the contractor’s. While I was meeting with these various Chinese dignitaries, my wife and daughter visited the offices of Turenscape, a 600 person internationally recognized landscape architecture firm, and saw the several historic sites including the Forbidden City and the Summer Palace. They also enjoyed the markets that sell, well, pretty much everything.

The next day, I met with the Beijing Cost Engineering Association (BECA) to explain what AACE does and discuss how our two organizations might work together. Reflecting the size of the Chinese market, BECA has approximately 10,000 certified cost engineers and 18,000 members in the Beijing area. BECA however is almost exclusively an estimating organization that produces costs guides for its members, not unlike MEANS in the United States. Later that day, I met with long-time AACE supporting organization, China Electric Council. We signed a renewed Memorandum of Understanding to continue to work together and I presented membership certificates to eight new AACE members.

On Thursday afternoon, Feng Shen and my family traveled to Shanghai by high-speed train. The view from the train was fascinating with carefully cultivated farms and greenhouses in every direction, with a high-speed train.
rise residential communities along the line that seemed to rise directly out of the cornfields. Little land was left fallow.

On Friday, my family and I were able to tour Shanghai, including a project by my principle host, the Shanghai Construction Group (SCG). The project was none other than the Shanghai Tower, the second tallest building in the world at 2073 feet. It also has the world’s fastest elevators at 67 feet per second, which causes your ears to pop. I would have preferred something slower. A beautiful and remarkable building with two concentric exterior curtain walls, separated by 20 feet; it is one of the very few Platinum LEED skyscrapers in the world.

Over the next two days, Feng and I presented a seminar to approximately 90 people in SCDG’s training facility. It appeared that many of the more senior managers attended and we had many questions, most in Chinese and a few in English. I had the easy part of the seminars explaining each slide, while Feng had to listen to my words and then translate to Chinese. Like at the BAC in Beijing, Feng had developed a slide pack in Chinese for the attendees.

Throughout my stay in China, Feng was an invaluable co-presenter and expert in all the topics I presented. Impressively, he could explain FSA (and CPM) concepts in the context of Chinese contractual construction practices, which are VERY different from US practices. Further, through Feng, Zuomin Wu of CECA, and Annabelle Wu of SCDA, my family and I had escorts and drivers for virtually our entire stay, making the trip very easy. In the five years since I had last been in China I noticed four big changes:

• First, like everywhere, cell phones are ever present necessities for everything.
• Second, credit cards seem to be no longer accepted—everyone pays through their cell phones.
• Third, Buick cars and SUVs are quite popular.
• Fourth, the tree planting mandate to mitigate the poor air quality has produced significant tree-lined highways, streets, and parks.

After Shanghai, we traveled to Xi’an, an ancient capital of China and toured for two days. It is now a modern city of eight million. Our two major sightseeing activities were visiting the historic city wall fortifications, a completely restored 14th century defensive wall that is 40 feet high, 45 feet wide, and 8.7 miles in length. We bicycled around the entire length on top of the wall. The wall encloses a near-perfect rectangular area of 5.4 square miles, with historic and modern neighborhoods within
We again had the opportunity to experience a typical Chinese shopping street, but refrained from eating the fried squid and other street food delicacies.

We also saw the spectacular terracotta warriors, dating from 210 BCE. This is one of the truly remarkable ancient artifacts that was only discovered in 1974 by local farmers digging a well. They unearthed a terracotta head that archaeologists eventually identified as part of the Tomb of Emperor Qin Shi Huang who built the extensive army with accoutrements to assist him in his assumedly military afterlife. Luckily for us, this army of approximately 650 horses and 8,000 life-size warriors with wooden or bronze swords, were placed in underground tombs roofed with logs. When the logs burnt out and collapsed several years later, the tomb was saved from plunder, even if the warriors were well smashed. The Chinese archaeologists use computers to scan the shards, which helps them reassemble the smashed parts.

The growth of AACE in China these past two years is the result of extensive groundwork done by past AACE presidents, and most importantly, by the current tremendous efforts of Feng Shen with significant support from our local partner associations and corporate members in China.

— JOHN LIVENGOOD
THE AACE® INTERNATIONAL

2018 Slate of Candidates

Included here is the slate of candidates for the 2018 AACE International Board of Directors election. Guidelines allow candidates to have posted a biography and goals/objectives for their respective offices. Annual AACE International elections are conducted electronically from Feb. 1 through 4 p.m. on March 15.

CAMPAIGNING IS PROHIBITED
The Board of Directors recognizes that the professional reputation and experience of candidates for Association office are ample testimony to their qualifications and ability to serve. Further, it is believed that these credentials do not need amplification and that campaigning for office by, or on behalf of, candidates is unnecessary, undesirable, and unprofessional.

After nomination, campaigning is defined as organized oral or written solicitation of votes or support, either by a candidate, or by an individual member or section, on behalf of a candidate. A proven violation of this policy shall be considered as prejudicial to the best interests of the Association and a breach of professional ethics. Such conduct will be subject to disciplinary action as provided for in the Association Bylaws. Further, a proven violation(s) of this policy by an aspirant to office, after due hearing in accord with the Bylaws, shall disqualify said individual from holding Association office.

The AACE International Canons of Ethics also states that, “Members will not campaign, solicit support, or otherwise coerce other cost professionals to support their candidacy or the candidacy of a colleague for elective office in a technical association.”

TO VOTE, MEMBERS MUST CAST A BALLOT ELECTRONICALLY ON OR BEFORE 4 PM. EASTERN U.S. TIME ON MARCH 15
Election of officers and directors will be by use of an electronic ballot. The official election ballot for officers will be posted and available to each member and associate member on February 1, 2018.

Members will link to the voting site from the AACE website homepage. Once at the site, members will use their member ID and password to access the ballot and vote. A security feature of the electronic voting system allows members and associate members to vote only once. A voter can print out a receipt that will include an individual verification number as proof of having voted.

For election of Directors-Region(s), these candidates will be listed as a continuing or additional page for members or associate members in the regions electing candidates during the 2018 election. Each voter shall properly signify on the ballot the voter’s choice for the director.

Any member or associate member with questions or other concerns is asked to contact Headquarters for assistance.

Voting will end as of 4 p.m. eastern US time on March 15, 2018. The electronic system will block any voter from casting a ballot after 4 p.m. on March 15, 2018.

Each voter shall properly signify on the ballot the voter’s choice for the various officers. A security feature of the electronic voting system allows members and associate members to vote only once. A voter can print out a receipt that will include an individual verification number as proof of having voted.

For election of Directors-Region(s), these candidates will be listed as a continuing or additional page for members or associate members in the regions electing candidates during the 2018 election. Each voter shall properly signify on the ballot the voter’s choice for the director.

Any member or associate member with questions or other concerns is asked to contact Headquarters for assistance.

Voting will end as of 4 p.m. eastern US time on March 15, 2018. The electronic system will block any voter from casting a ballot after 4 p.m. on March 15, 2018.
As President of AACE International, I would:

• Actively support, strengthen and promote our Technical, Education and Certification Boards. Our technical and education products along with our certification programs are the life blood of our members and help build up the require cost engineering toolboxes that we bring to our employers, clients and project teams.

• Support, strengthen and promote our mentoring programs. I believe that it is the Association's duty to provide a mechanism that shares the depth of knowledge of our senior members with our newest members.

• Continue to provide support and resources to our Sections to allow them to best understand the AACE International technical products and certification programs and share this information with the members at the Section level.

• Continue and expand our presence internationally. As the world economy continues to expand, the need for our Association members to bring Total Cost Management principles to owners, clients, employers, and project teams worldwide, is expanding exponentially and AACE International must be in the forefront.

• I bring a commitment to support and provide the amazing AACE International headquarters staff with the tools necessary to deliver the levels of service that we have come to expect from them.

and project consulting both from the prospective of the owner, engineering, construction industries and public sector. Since becoming a member of AACE International in 1993, Doug has become active in AACE International related activities. He has held elected office at the association level, been active in standing AACE committees, taught AACE sponsored courses, written papers and presented at Annual Meetings, been an active member of AACE taskforces, edited PPGs, contributed to RPs and been highly involved at the section level. Doug is certified as a Certified Cost Professional, AACE Intl. (1998), Certified Estimating Professional, AACE Intl (2008), and Fellow, AACE Intl. (2011). Doug has been awarded the AACE Intl. Honorary Life Membership 2016, AACE Intl. Outstanding Technical Subcommittee Chair 2015, and AACE Intl. Brian D. Dunfield Educational Service Award. 2015. He is the Chair of the Estimating Committee (since 2000), Chair of the Constitution and Bylaws Committee (since 2004), Member of the Ethics Committee (2017), was a member of the Certified Estimating Professional Task Force (2006-2008), elected Director of Region 2 (2003, 2004) and a three time elected Genesee Valley Section President. Doug is currently a member of the Kansas City Section.

GOALS AND OBJECTIVES:

As President of AACE International, I would:

• Actively support, strengthen and promote our Technical, Education and Certification Boards. Our technical and education products along with our certification programs are the life blood of our members and help build up the require cost engineering toolboxes that we bring to our employers, clients and project teams.

• Support, strengthen and promote our mentoring programs. I believe that it is the Association's duty to provide a mechanism that shares the depth of knowledge of our senior members with our newest members.

• Continue to provide support and resources to our Sections to allow them to best understand the AACE International technical products and certification programs and share this information with the members at the Section level.

• Continue and expand our presence internationally. As the world economy continues to expand, the need for our Association members to bring Total Cost Management principles to owners, clients, employers, and project teams worldwide, is expanding exponentially and AACE International must be in the forefront.

• I bring a commitment to support and provide the amazing AACE International headquarters staff with the tools necessary to deliver the levels of service that we have come to expect from them.

Mr. Regan has a proven record of excellence in achieving goals for project teams and clients in in the Middle East, North Africa, Eastern Europe, and the former Soviet Union. Mr. Regan is also experienced in implementing PM and construction control systems for facilities, telecommunications, power, infrastructure, nuclear, and petrochemical projects. Mr. Regan has experience with DTRA/DCMA/FAR, IMF, World Bank, EBRD, and Asian Bank polices and tendering in support of projects. He also is an active member, author and presenter for AACE, PMI, ACostE, ICEC, ACCE, and the Project Controls Guild. Mr. Regan has presented to over 5,000 people on 5 continents and over 50 countries on project controls, international TCM, and skills and knowledge. An active member of the international communities and supportive of programs working with the US, UK, and Canadian governments, and the European Union. Including courses on CCP, CEP, EVP, PSp, CST, CCT, DRMP at introduction to expert level.

GOALS AND OBJECTIVES:

My overall goal and objective is that AACE needs to continue even more aggressively on the international market on the spreading of the greatest secret in the industry – AACE. This will come from cooperation with international associations and an increased international branding and translation strategy. This will be accomplished by:

• Strengthening the international recognition and appearance of the Association.

• Working directly with RD and local sections to strengthen the membership and financial solvency of the sections.

• Meet with maximum amount of sections and support regional conferences.

• Maximize the potential of the volunteer groups by streamlining redundancy.

• Establish reasonable metrics which will increase growth based upon geographical conditions, not just numbers.

• Increase team building and diversity among membership.

• Work with key associations that support AACE or can be supported in a joint venture position.

• Review of best international practices and align AACE future visions in accordance to these.

• Review that the associate boards practices and standards are in accordance to the future visions, such as new certifications, online practices, training and technology.

• Acceleration of translation by working in strengthening programs such as COMP, AEP and government entities inclusive of grants and donations.
PATRICK M. KELLY, PE PSP
Patrick Kelly is a Director in Navigant’s Global Construction Practice, and has more than 20 years’ construction-related experience, including construction management, contracting, project controls, CPM scheduling, Earned Value Analysis, Forensic Schedule Analysis for Delay and Disruption, and Claims & Disputes Resolution. He is a Professional Engineer, and is certified as a Planning and Scheduling Professional by AACE. In his career, Mr. Kelly has been a US Navy Surface Warfare Officer, a Navy Civil Engineer Corps Officer, a contract & construction manager, a scheduler & project controls manager, a construction claims analyst, and a testifying expert on Critical Path Method scheduling and Forensic Delay Analysis. He has also written and published many articles on scheduling and Forensic Schedule Analysis, and provided training on both software and CPM methodology to schedulers, analysts, and construction professionals. During his career in construction, Mr. Kelly has relied on the superior papers and Recommended Practices developed by AACE, and as a result he joined in 2007, and earned his certification as a Planning and Scheduling Professional in 2008. Since then, he has been actively involved in AACE, by submitting papers for publication in Cost Engineering journal and presentation at the Annual Meetings. Additionally, Mr. Kelly has held the Chair of the Claims and Disputes Resolution Technical Subcommittee for three years and is currently serving on the Board of Directors as Director, Region 2. His deep respect for AACE’s mission and superior technical content drives him to continue to seek ways to serve the organization and further its goals.

GOALS AND OBJECTIVES:
If elected, Mr. Kelly intends to facilitate growth and professional development among cost engineering professionals by:

- Building upon the momentum created by my predecessor in ensuring the continued financial success of AACE.
- Providing effective support for the conduct, control, and reporting of financial transactions in accordance with generally accepted accounting practices (as provided by Headquarters).
- Coordinating closely with Manager – Accounting and Administration and the Executive Director on financial matters.
- Providing timely, clear and concise communications to all stakeholders with regards to income, expenditures, forecast and balances for the prior reporting period.
- In coordination with all relevant parties, preparing annual budgets that further the goals of AACE in the coming years.
- Maintaining awareness, and monitoring when appropriate, operations to ensure that AACE achieves its organizational goals and fulfills its vision of becoming the gathering place and source of thought leadership for professionals who drive successful project and program delivery.

CALVIN J. SPEIGHT JR., CCP
Since joining the AACE International in 2008, Calvin has had an active role in the National Capital Section as an exam proctor, Treasurer, Vice President, and President. He most recently served as Region 2 Director, 2014–2016. At present, Calvin is the Government Liaison Committee Chair. He has also been published in Cost Engineering. He earned a B.A. in Business Administration from Rutgers University, 1985, and an M.B.A. from the University of Pittsburgh, 1990. Certificates held include Project Management from UC Irvine, 2006, and Advanced Project Management from Stanford University, 2012. He is a CCP, PMP, and MRICS. Calvin is the owner of Project Executive Outcomes LLC, a consulting firm that is focused on cost-schedule risk integration of major projects with the vision and leadership that successfully integrates and optimizes: business case, technology, sustainability goals, resiliency, and asset management. In the energy vertical of a leading consulting firm, his expertise impacted public policy decisions concerning military health, defense renewable energy, cost restructuring of civil agencies, and risk assessment for NASA. Prior to consulting, leadership roles held included Business Planning Manager at Pacific Gas & Electric and Senior Cost Engineer for Southern California Edison Nuclear Organization. Top line revenue experience was gained as the CFO of a start-up construction firm that focused on public school capital improvement programs. In short, he can bridge the gap between engineering and management.

GOALS AND OBJECTIVES:
To drive my role as VP-Finance, I foresee these objectives as critical:

- Build upon the momentum created by my predecessor.
- Parlay my financial training to drive revenue that will assure funding of our vital programs, and enhanced marketing.
- Use methods such as activity-based costing, process improvement, and forecasting to drive decision-making.
- Create goodwill for AACE by promoting the association membership, certification, COMP, and other revenue levers to industry, government, and academia.
Les McMullan, FAACE

Les has been an AACE member and advocate throughout his career with more than 35 years’ experience in estimating, project controls and project management on capital projects. In 2012, he was named an AACE Fellow by his peers. He has served as President of the Montreal Section for many years where he continues to provide assistance to the board. In the last two years, he has served on the AACE Board of Directors as Director of Region 1 and President of AACE Canada. He is a graduate of McGill University and is invited frequently as a guest lecturer at Montreal universities on topics such as earned value and cost/schedule integration. Les has authored and co-authored technical papers on estimating, cost control, cost forecasting, change management and project controls management. His most recent paper in 2017 was entitled, “Proactive Trend and Change Management: Avoiding the Iceberg Effect”. Les attributes the knowledge attained from AACE as a key factor for a successful career. He has worked in various industries including oil and gas, mining and metals, pulp and paper, energy and held senior project controls roles on international projects, as well as corporate management positions in project controls and risk management for consulting organizations as well as owner organizations. This has provided a project lifecycle view, including strategic asset management as well as project control. In his role as Global Director, Project Controls at Hatch, Les is responsible for worldwide oversight of project controls and has extensive experience interfacing and providing leadership to global regional groups. He is dedicated to promoting skills and knowledge to develop the current and next generation of estimating and cost/schedule professionals.

Harrison W. Staley

Harrison has been a construction management professional for over 22 years and has used project controls in the management of numerous projects that span private and public sectors and includes schools, banks, community centers, police stations, public works, transportation and airport projects.

At Ardmore Roderick, Harrison worked for large international consulting firms and public agencies. Harrison has been a member of AACE International since 2013 and is currently the Region 4 Director on the International Board of Directors (2016‐2018) and the Vice President of the Chicago‐Midwest Section (2016 – 2018). He previously served in roles as the Secretary, Scholarship Chair and Membership Chair for the section. He is currently preparing for the PSP exam and hopes to earn the certification in 2018.

As Region 4 Director, he conducted a number of conference calls with the Section Presidents to discuss the state of the association, share ideas gathered at the Annual Meeting and generally offer support to all of the sections. Additionally he has fostered communication among the sections in particular between sections that have been more active and those that have struggled with membership and participation.

GOALS AND OBJECTIVES:

- Use my experience and insight working at the Section and on the Regional Director level to work closely with the Regional Directors to build for the future and promote AACE.
- Facilitate sharing and communication between the Regional Directors of North America to build on regional success and new initiatives such as regional workshops, symposiums and virtual meetings.
- Provide guidance to the RDs for update of the Section scorecards for Section awards and recognition program.
- Promote certification and coordination of training materials with the Regions, HQ, as well as AEPs.
- Encourage regional presence and speakers at the Annual Meeting, as well as for regional meetings.
- A community page for the Regional Directors on the AACE website, as well as regular RD teleconference calls and prepare a metric dashboard for reporting.
- Sponsor Section and Region brainstorming sessions at the Annual Meeting to discuss recruitment, growth, education, student membership and sponsorship opportunities.
- Collaborate with Regions on ideas to reinvigorate less active sections and discuss succession plans to maintain robust activity in all regions and provide section board guidelines for successful meetings.
- Participate in marketing strategy for future growth.
BINDU AMIN, 
CCP EVP

Bindu Amin, MSc., MBA, CCP, EVP, PMP, is a seasoned Project Controls/Project Management leader with over 20 years Canadian and international experience in areas of project management, coordination and project controls in upstream and downstream projects in construction, oil sands and pipeline industry. She currently works for Husky Energy in Calgary, as Project Controls Lead and is responsible for capital projects in Oil Sands Business Unit. Her role involves managing a team of professional who are responsible for managing cost, planning and scheduling, progress management, change management for a number of projects going through different phases. Bindu has enjoyed being member of AACE International for over 14 years participating and contributing in a number of different ways. She has been an active member of Chinook Calgary Section serving the board as certification director for number of year before becoming Vice President and ultimately President for 2016-2017 term. She attributes her success to her open-minded attitude toward acquiring knowledge in which AACE has been a big contributor. As a new immigrant in Canada 2002, she credits AACE community whole heartedly for welcoming her with open arms and enriching her life both professionally and personally. She truly believes that joining AACE was the best decision she made several years ago and recommends it to anyone who asks for her advice. With her long association with AACE, she has inherent knowledge on the working on local sections as well as organization as a whole and she would use this knowledge to develop integrated strategy to advance the association in a wholesome manner to by connecting local sections better and using each other's strengths to progress Region 1 collectively. With her collaborative leadership style, she will focus on learning new and improved ways to engage, connect and disperse these best practices to all the sections across Canada to implement.

GOALS AND OBJECTIVES:

• Promote dialogue and interaction between various Canadian sections to gain synergy in terms of sharing best practices, technical resources, presenters and job opportunities to strengthen and progress Region 1.
• Encourage women who work in project controls to take a larger role in leadership positions in administration of AACE local sections, as well as the International organization.
• Publicize the value of AACE membership and its advantages in terms of acquiring skills and knowledge not only from well-developed technical repository but also through getting connected to other members who can help and mentor through their practical experience.
• Advocate the value of acquiring various AACE International certifications to the project control community.
• Help AACE organization adapt and change to a new world where technology is going to play an important role in breaking barriers and connecting with future generation to advance the association in coming years.

PRANAB KUMAR DEB, 
PENG. PSP

Pranab Deb, P.Eng PSP PMP, a member of AACE for over a decade, has been volunteering for the past 8 years, having started as a Section Board member proctoring exams and making arrangement for Section dinner meetings. He has served the UAE Section as VP Membership and Marketing and as a member of the marketing team for the International TCM Conference in 2012 in Dubai, UAE. He is a project management/controls professional possessing over 15+ years of experience in engineering, procurement and construction project management including oil and gas, energy, commercial and heavy civil. In 2013, he moved to Edmonton, Canada, to work on a major refinery project as a Senior Project Controls Specialist. He started as a member at large. In 2015-2016, Pranab was elected as the President of the Edmonton Aurora Section. He started a webinar series for section members who cannot attend dinner meetings in person, certification training workshops at very subsidized fees and coordinated with other Associations in the Edmonton region to organize joint events. He also setup outreach events to the University of Alberta to initiate students into the project controls profession. He is also part of the Mentoring Success Advisory Committee and joined the Decision and Risk Management Subcommittee. Pranab is a Civil Engineer registered with the Association for Professional Engineers Alberta. He also holds the PSP from AACE and PMP from PMI. He is employed with Stantec in Edmonton, Alberta.

GOALS AND OBJECTIVES:

I would support all the grassroots efforts of the Sections that eventually contribute to the overall growth of the AACE.

• Improve communications between the AACE leadership and Sections/ Region.
• Support efforts of the Sections in arranging joint meeting opportunities with other professional associations/societies like PMI, ASQ, CSCE etc.
• Organize and arrange a few webinars for the region from Annual Meeting presentations.
• Create a pool of Subject Matter Experts in project controls, planning, scheduling, estimating, cost control etc., who can be contacted with specific queries. The SMEs would be listed in either a region based portal or section portal.
• Solicit section volunteers for AACE committee and boards and encourage Annual Meeting attendance. Nominate members for various AACE awards and scholarships.
• Assist struggling sections with support and advice from well performing sections in the region.
• Increase awareness of AACE certifications through advertisement, networking with recruiters, and presentations to technical colleges and universities in the area.
• Use social media to enhance member communication, and advertisement of AACE events.
W. REGIS FOX, PSP
Regis Fox is a Planning and Scheduling Professional who has spent his entire career in scheduling and project controls for commercial construction, working for subcontractors, contractors, and owners, providing services from preconstruction through litigation. His portfolio of experience includes manufacturing facilities, secure government locations, museums, aviation, academic, entertainment, transportation, and mixed used development projects, valued at over $10 billion. As Director of Enterprise Scheduling for Clark Construction Group, he oversees the corporate Planning & Scheduling Department and works with project teams to implement best practices and effectively use technology to improve performance. Previously, he was Director of Project Controls for McKissack & McKissack, where he organized their project controls staff into a business unit providing standalone consulting services for existing and new clients. He is the Section President of the National Capital Section, he has a Civil Engineering degree from the University of Maryland, and he currently lives in Baltimore, MD, with his wife Kelly.

GOALS AND OBJECTIVES:
My goal is to be a voice for the sections on the Board and to connect our section leaders with one another to share best practices in section management, so that they can provide the best resources for our membership. I hope to bring a fresh perspective to the board from the generation that will be using AACE and its content for the next 60 years.

OMONIYI O. LADIPPO, CCP EVP
Niyi has been an active member of AACE since 2005. She achieved Certified Cost Professional in 2007, and Earned Value Professional in 2010. Niyi has successfully recertified in both CCP and EVP. Ms. Ladipo has actively participated in the following positions of responsibility with the National Capital Section: Secretary, President; Past President; Board Director; Chair for Education and Scholarship Committee. From 2015 to 2017, Niyi participated with the EVM Subcommittee, reviewing and evaluating technical submissions. Niyi is a member of the Marketing Advisory Committee at the International level. Ms. Ladipo was recognized by AACE as an Outstanding Woman in Project Controls in 2010. Niyi was instrumental in the organization of a group of DC Metro area middle school and high school Science, Technology, Engineering, and Math (STEM) students and their teachers, who were invited to attend a full day of events at the 2013 Annual Meeting. Niyi is a Program Manager for MBP, a multi-disciplined consulting firm. She has more than 30 years of experience in providing construction and project management, and is a leader in contracts administration and management, cost estimating, cost management and control, and earned value management. Currently, she is actively involved in two high profile projects, the Dulles Corridor Metrorail's Silver Line extension of the rail transit system and the Architect of the Capitol's Cannon House Office Building Renewal, both in the Washington, DC region. Niyi has co-authored papers to include (Earned Value Analysis and CPM Schedule Review in Construction), presented at an AACE Annual Meeting, and presented other topics at two AACE Region 2 Symposia. Ms. Ladipo co-authored Chapter 2 in the 2013 Construction Law Update and presented at other professional association conferences on topics related to EVM and construction schedule reviews. Niyi earned her Bachelor’s degree in Civil Engineering from the University of Maryland, College Park, and her Master’s in Construction Management and Economics from the University of Greenwich, London.

GOALS AND OBJECTIVES:
As Region 2 Director, I will work closely with the VP Regions and others on the Board to implement the goals and objectives of AACE and support the Strategic Plan initiatives.

- Review goals for Region 2 with my predecessor and enhance/align these with the Strategic Plan.
- Improve current outreach to future AACE membership through expansion of collaboration between AACE Sections and local public and private companies, and universities and colleges; through professional development, networking events, and student scholarship opportunities.
- Support all Region 2 Sections in promoting increased membership participation and growth. Encourage Sections to seek innovative approaches to increase membership’s participation in local and national events.
MAGED EL-HAWARY, CCP EVP PSP

Maged El Hawary, CCP EVP PSP, is a certified Project Management Consultant with almost 20 years experience.

He has served as:
• President – UAE Section (2014-2016).
• Project Controls Director ASGC.
• Guest speaker and dissertation supervisor Heriot Watt University.
• Held several managerial positions in key international companies.
• BSc. Civil Engineering, P.G. Dip. Construction Mgmt., MSc. Construction Mgmt.
• Certified CCP, EVP, PSP and is a PMP with PMI.
• Professional speaker and panelist in many international conferences.
• Received the following international awards:
  • Charles Kean Distinguished Service Award – AACE International 2014;
  • Team Leader of the Year – 1st UAE PM Conference – SOE -2015.

GOALS AND OBJECTIVES:
• Promote AACE International’s name and activities among the region.
• Strengthen Region-07 existing sections.
• Improve the link between Region 07 sections.
• Frequent visits to different sections.
• Organize a yearly international event in the region lead by different sections leaders.
• Support rising stars in different sections.
• Increase membership numbers.
• Improve the interaction between AACE international and industry professionals.
• Open new links between AACE international and other professional communities/universities.
• Promote AACE International’s different certifications.
• Activate and support new sections (Jordan, Egypt…).
Adam T. Althoff, PSP

Adam T. Althoff, PSP, has been an active member in the organization since receiving his PSP in 2012. He sees his largest contribution to date as the initiation of a local section in Omaha, Nebraska, in 2016. Adam has had the privilege of working for one of North America’s largest and most respected contracting and engineering firms, the Kiewit Corporation, for 10 years. All of which have been spent in the project controls field, currently serving as the Director of Planning and Scheduling.

GOALS AND OBJECTIVES:

• Currently leading the planning of what we are calling the “Midwest Regional Symposium” for April 2018. Geared at bringing together members who are not able to attend Annual Meeting but still have an interest in sharing knowledge and networking with their peers from Region 4.
• Continuing to reach out and attempt to grow the Omaha Section in my current role as Section President, with an emphasis on bringing young professionals to the group and educate them on the career long benefits of AACE.
• Foster the relationships built through this organization, as well as encourage continued additions and refinement to the greater AACE body of technical knowledge. Making every attempt possible to spread the word about the fabulous technical products and papers available to our peers.

Danilo Arba

Danilo Arba, has been an active member of AACE International since 2014, with over 15 years of project experience in the fields of Cost Control, Planning & Scheduling and Project Control on projects such as hydropower, high speed railways, FIFA World Cup Stadiums and other major infrastructure projects around the world. He is currently serving as President for the Italian Section of AACE International and Senior Planning Manager for Westfield Corporation. He is also the founder of DAV Consulting providing consulting to the construction industry and specialized software implementation.

He promoted the creation of the Italian Section of AACE International during which he organized the first certification courses for CCP and organizing the first Italian Congress to be held in Milan on the 21 April 2018, all of which will be available in live streaming and the certification courses will be also available on demand.

He has lived and worked all around the world from South and North America to Africa, Middle East, South East Asia and Europe. He has also participated as a speaker in various AACE International events, including Peru’, Russia, Dubai and Brazil.

He holds a Bachelor degree from the University of Lugano, Switzerland, and finished a full year course on Total Cost Management from the Italian Association of Cost Engineering.

GOALS AND OBJECTIVES:

I have been actively involved in AACE International since 2014. I have experienced firsthand the benefits AACE can bring to your professional development and career.

My main goals are:

• Collaborate with universities, public sector and companies from all sectors that are not fully aware of the benefits of TCM and AACE International, and make them understand the benefits that this can have on their organization, both in small or large organizations.
• Continue the growth of Sections in Region 9 and the collaboration between them so that available resources can be better used for a greater benefit to all members of Region 9.
• Increase members of Region 9 both collaborating with complementary associations existing and present in various countries.
• Promote a coordinated program for all the activities of Region 9 and initiate a marketing/communication campaign to reach as many potential colleagues as possible.
Data-Driven Management for Digital Capital Projects

BY MARGARET LUCEY; JESSE LUND; AVI SCHWARTZ; AND SAMARTH SHAH

ABSTRACT
Construction projects and budgets are under scrutiny—requiring an increase in transparency, accountability, and accessibility to information. Combined with an influx of data from emerging technologies, the challenge for executives is to transform this information into insight, promoting data-driven decisions as they balance increased demands with limited resources. The typical implementation of project management solutions within capital programs often leads to redundant tracking from multiple systems and decreased data quality from disconnected systems. The various data sources hinder managers from prioritizing, understanding, and reporting project performance. Analytical and data visualization solutions tailored to the construction industry can help summarize performance, provide deeper insights, and highlight previously unknown risks — critical in managing complex construction portfolios. Maintaining access to construction analytics based on readily available data sets provides owners with rapid and reliable snapshots of project performance along with predictive indicators. This allows business owners to more effectively monitor their projects and more easily identify risks.

INTRODUCTION
Leading large, complex capital projects to a successful conclusion can often feel like a high-wire act. Each project is unique with multi-dimensional challenges, often under significant pressures relating to value, cost, time, and public scrutiny. Minor schedule delays or cost increases may materially impact project performance and the business case originally used to justify the project. In the United States, where more than $1 trillion is spent on construction annually, such delays and cost increases can result in major spending which could otherwise be avoided or used for additional projects [13, p.1].

The construction industry is known for delivering certain projects late, over budget, or even with poor quality. According to a recent Project Management Institute (PMI) survey that looked at all projects, not just construction, only 53 percent of projects are completed within their original budget, and only 49 percent are completed on time [9, p.5]. The lack of successful delivery results in wasted money: Approximately $122 million is wasted for every $1 billion invested as a result of poor project performance [9, p.5]. Specifically, in the construction industry,
nine out of 10 transportation infrastructure projects incur cost overruns [3, p.5]. These trends raise an important question: How can the construction industry deliver projects more efficiently?

In recent years there has been a greater push to incorporate new technologies into the construction industry to increase productivity. However, the industry has been reluctant to make a significant investment to improve IT systems. Construction is last in IT spending compared to other industries [5, p.17]. A recent survey found that 70 percent of the construction industry is spending one percent or less of its annual sales volume on IT [6, p.14]. This trickles down to the project management level, where approximately 67 percent of professionals are still tracking and reporting performance via manual processes or spreadsheets [7, p.51].

Given current trends toward increased transparency and decreased funding, capital project owners need to understand, manage, and mitigate risks throughout the lifecycle of these highly complex projects and portfolios. Data from sources, such as drones, RFID, and 3D modelling, can help to manage projects successfully and provide transparency. However, this influx of data and the ability to process and make decisions using it is still new to the industry [4, p52]. The ability to access an efficient and reliable management system that moves an organization from retroactive to proactive management allows leadership to anticipate and respond to risks even before they emerge. In turn, this can help them successfully deliver their capital projects on-time and within budget.

**PROJECT DELIVERY CHALLENGES**

Throughout the project life cycle, capital project owners use a combination of systems to perform various technical functions, but the systems often operate independently and lack the business intelligence for truly effective management. Some 58 percent of construction professionals use at least three or more software applications to conduct their business, yet 27 percent of those applications do not integrate [8, p.34]. As a result, businesses face challenges that shift resources away from project delivery and instead focus on basic data management (recovery, analysis, interpretation, reporting). This often leads to wasted time, unreliable results, and misinformed decision making. In our experience there are several common challenges, including:

**DATA ISSUES**
- Multiple data systems: Attempting to combine data or reconcile data issues across many users who use different systems.
- Lack of system connectivity: Unconnected systems prevent users or leadership from seeing a complete picture, requiring multiple applications or reports to be open at once to understand the outputs.
- Manual compilation: Unconnected systems, lack of business intelligence, or data reconciliation often require users to manually compile and transform data to fit present needs or leadership requests.
- Un-prioritized and unorganized: Compounded by the size and complexity of a project, finding the right information is akin to finding a proverbial needle in a haystack.
- Largely paper-based: Data management remains a very time-consuming exercise with high potential for errors.
- Increased transparency demands: Whether the board of directors or Congress, owners want results – and they want them now.
- Limited traceability: An inability to aggregate data across the portfolio limits capital owners and audit teams from quickly understanding the big picture. Additionally, tracing to root cause issues or drilling into the appropriate details remains a very time-consuming exercise with high potential for errors.
- Digestible Results: Complex projects lead to complex reports, often hundreds of pages for monthly updates. For time-strapped executives, these are impossible to manage – especially across a national or global portfolio. Timely decisions cannot be made effectively or with the confidence necessary to manage such an undertaking.

Construction owners are usually unable to leverage portfolio data in a connected and consolidated environment and cannot easily develop deep insights to inform business strategies. They are left with already limited resources to manage the competing demands of mitigating short-term project risks and planning long-term business strategy.

Technological advances generally are implemented to help improve project delivery. However, an unintended consequence is the significant increase in the volume of available structured and unstructured data from technologies, such as drones, smart buildings, BIM modeling, and even cameras on tower cranes [10, p.1]. As a result, leveraging technology in today’s construction industry is a strategic imperative for capital projects to succeed, in light of increasing accountability and transparency demands.

**CONSTRUCTION ANALYTICS**

Related to the AACE International Total Cost Management Framework, construction analytics promotes a systematic approach incorporating the latest technologies to enable effective management and control cost, schedule, quality, and risks [1, p.1].

Use of analytics in construction connects data from disparate systems, unstructured data, and paper-based records to provide insights and predictive sensing. This helps leaders identify risks across their full portfolio of projects, even before they occur. As it pertains to this paper, analytics refers to the analysis of data and use of statistics to identify meaningful patterns or trends.

As the volume of available project data increases, capital project owners should leverage construction analytics to consolidate and simplify the burden of document and information management. This helps reduce the number of moving parts typical in construction projects. Further, this helps enable capital project owners to hone in on the optimal combination and amount of integrated project data. Ultimately, this lessens the resource efforts in collecting this information and maximizes the impact on project delivery and the actual return to owners.

The use of construction analytics can be as simple or as advanced as organizations decide. The maturity model, shown in Figure 1, Error! Reference source not found. demonstrates that data collected can be used to move project management from hindsight to insight to foresight. Depending on the metrics calculated, construction analytics can be descriptive but also predictive and prescriptive.

**DESCRIPTIVE CONSTRUCTION ANALYTICS**

Descriptive construction analytics can provide the overall status of a project based
on data collected from the field. Project management and leadership can use descriptive construction analytics to quickly view the health of a project, dig deeper into issues, and plan corrective actions if necessary.

Careful planning and execution of data management lays the groundwork for descriptive construction analytics. Once that groundwork is set, businesses can work with the data to establish ideal reporting capabilities, program and project views, rules for alerts, and key performance indicators.

**ENTERPRISE DATA MANAGEMENT**

The effectiveness of construction analytics depends on the quality, accuracy, and completeness of the supporting data. Some common factors that have historically reduced an organization’s ability to monitor its data at the portfolio level include:

- Project data are retained in multiple systems, making it difficult to aggregate and compile data into program-level reporting.
- Data input is inconsistent in various systems and does not present a complete picture of contract performance.
- Project managers receive multiple time-consuming data calls rather than a single data entry process.

Data extraction, population, reporting, and maintenance can address each of these factors and can be implemented in a way that does not impact the ability to manage projects or portfolios.

It is important to understand the key business systems, identify authoritative data sources, and assess data accuracy. No matter how many source systems exist, the data should be collected in a single logical repository or database. This repository is vital to the implementation and operation of construction analytics. It serves as the central location for integrating data from multiple disparate sources and disseminating this information to run the analytics.

Consolidation of data from multiple sources will highlight data quality and security challenges. Proper management and maintenance of data promotes standardization, and helps to identify areas in need of data quality improvement. Aggregation of data in a single logical repository creates the need to understand user roles and establish levels of authorization to manage access to valuable information about the business.

The collected data should all funnel into software that provides visual representations of the analyzed data. Several tools on the market can assist with visualization, such as Tableau and Qlikview, which have data visualization capabilities that are designed to connect to databases.

**MANAGEMENT REPORTING**

A particularly useful output of construction analytics is the ability to quickly generate reports at the executive, management, and field levels. These reports provide a meaningful view of the organization’s construction data for every level, and help project staff and leadership make tactical and strategic management decisions. The most effective way to achieve this type of reporting is to solicit user requirements for reporting and data display at each level of the organization.

The reports should provide a clear and visual representation of valuable performance indicators around key focus areas, such as safety, operations, financials, schedules, quality, customer satisfaction, and earned value. Reports should take the audience’s role into account. For example, the owner of a construction company wants to see how his portfolio of construction projects is faring, rather than the details of one specific project. Figure 2 provides an example of possible levels of reporting along with the details that would be provided with each level.
ROBUST FILTERS AND DRILL-DOWN FEATURES

Similar to the importance of reporting levels, the visualizations of construction analytics should interactively transition from specific details about a project to a summary of an entire portfolio. Successful implementation of construction analytics will present data clearly and concisely, and provide features and functionality that allow the user to easily navigate the information. The following examples demonstrate some functionalities that provide multiple levels of data:

- Varying Levels of Granularity—Assess key performance indicators through different lenses to view them at the portfolio or project level. This feature allows users to drill down from high-level information to the finer detail and support to better understand where issues exist.
- Geographic Analysis — The ability to determine if local or regional factors impact project performance and view the portfolio as a whole, identifying and isolating issues by location, size, costs, etc. Figure 3 provides an example of a geographical presentation of a portfolio of projects.

The ability to sort, drill down, or filter the results of analytics will help simplify how users pinpoint the specific information they seek. Some methods for organizing data allow staff and leaders to:

- Use portals to organize a collection of performance indicators
- View performance based upon aggregation by time period, e.g., daily, monthly, quarterly etc.
- Employ contextual formatting and adjustable triggers and thresholds that signal health relative to the performance indicator
- Cut and paste construction analytics tool visuals into presentations, reports, and briefings
- Configure the tool to a preferred level of view

PERFORMANCE METRICS

A robust set of performance indicators is critical for providing business owners insights into the various contracts and projects in their portfolio. Key performance indicators (KPIs) should be simple, practical, and relevant [11, p.1]. Using relevant performance indicators, owners can effectively quantify, monitor and control their performance, and make intelligent adjustments to their projects and contracts. Performance indicators also allow companies to benchmark their construction projects against similar organizations in the construction industry.

Table 1 provides examples of traditional cost, schedule, and risk industry performance indicators, as well as more qualitative indicators that could impact performance. These indicators highlight overall project health and performance trends, providing predictive insights to help mitigate issues before they become critical.

THRESHOLDS, EXCEPTIONS, AND ALERTS

The significance of well-defined performance metrics is realized once thresholds, exceptions, and corresponding alerts are applied. These provide the necessary business rules, which determine how metrics are evaluated, prioritized, and escalated holistically across the portfolio. Thresholds will vary by industry and project type, but can also vary internally (within individual projects or companies), depending on the desired outcomes, differences in

---

**TABLE 1. Sample KPIs**

<table>
<thead>
<tr>
<th>Cost</th>
<th>Budget Variance</th>
<th>Change Order Approval and Escalation</th>
<th>Withheld Payments</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Cost Performance Index Estimate At Completion</td>
<td>Growth Payments vs. Progress vs. Budget Line Item Variance</td>
<td>Soft Cost Breakdown and Baselines Contingency Usage</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Schedule</th>
<th>Total/Negative Float</th>
<th>Labor Productivity</th>
<th>Multiple Critical Paths</th>
<th>Resource Leveling Month-over-Month Change Key Milestone Progress</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Schedule Performance Index Baseline Variance</td>
<td>To Complete Performance Index</td>
<td></td>
<td></td>
</tr>
</tbody>
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</table>

<table>
<thead>
<tr>
<th>Quality</th>
<th>Checklist Monitoring &amp; Scoring Inspection Conformance Trends</th>
<th>Claims Processing and Growth RFI/Submittal Processing Time Punchlist: Trending Duplicative RFIs</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Claims Processing and Growth RFI/Submittal Processing Time</td>
<td>Punchlist: Trending Duplicative RFIs</td>
</tr>
</tbody>
</table>

| Safety       | DART rate Lost Worker Hours Severity Index Injury Cost Impact Composition and Distribution Non-incident Days |
|--------------|------------------------------------------------------|--------------------------------------------------|
|              | DART rate Lost Worker Hours Severity Index Injury Cost Impact Composition and Distribution Non-incident Days |

**FIGURE 3. Sample Geographic Representation**
delivery, etc. Contingency by project size or delivery method must be factored into the performance metric evaluation to create an equivalent comparison of individual projects within a portfolio.

Once thresholds are established, identifying potential exceptions becomes the next necessary step. Though ideally these are limited in scope, the reality is that situations may occur which fall outside the established performance metrics and thresholds, yet still be acceptable based on extenuating circumstances. These could be short-term changes in strategy, known and unavoidable circumstances, or changes in market conditions. Ultimately, the goal is to reduce the frequency of “false positives,” which trigger the performance thresholds and generate alerts for non-compliance results when not warranted.

With both of these conditions (thresholds and exceptions) selected, the final step involves creating alerts and notifications to highlight the risks that need to be addressed. Alerts should roll-up into the executive report dashboard. This concept follows the Pareto principle, which provides a pre-filtered and prioritization listing of the key actions for management.

ADVANCED FORECASTING

PREDICTIVE AND PRESCRIPTIVE CONSTRUCTION ANALYTICS

After creating the structure necessary for descriptive construction analytics, businesses may naturally migrate toward more advanced analytics. Predictive and prescriptive analytics can uncover hidden relationships and patterns within the data. In turn, this can help businesses to proactively address potential delays or cost overruns — possibly even before they occur. Algorithms and machine learning lead to a continuous improvement loop, whereby future performance predictions improve as more data is collected. The results improve upon themselves as more data is collected and used to predict future performance. These results provide clear feedback to management on what risks exist and where efforts should be focused.

QUANTITATIVE ANALYSES

At the onset of a capital projects lifecycle during the feasibility and planning stage, the availability of reliable data can be scarce. Yet this is the time when significant sums of money may be committed to a project and eventually require defensible justification for the decisions made.

Although businesses may benchmark costs or schedule against similarly completed projects or industry standards, there are often qualitative attributes that need to be addressed when defining project success. Either to eliminate subjectivity or establish value measure, quantitative analysis can be used to test a hypothesis — whether it be to fund the project or not, stress-test the sensitivity of results, or examine multiple outcomes with various scenarios. Outlining the possible outcomes can help capital project owners make more effective decisions upfront, despite any limitations.

ANALYZING UNSTRUCTURED DATA

Predictive techniques may be applied to unstructured/text data to monitor inconsistencies and potential risks in vendor contracts and other relevant project documentation. These techniques combine patterns identified in the trend analysis, while incorporating advanced text analytics algorithms to extract meaning from large volumes of free-form text (e.g., daily logs, RFIs, and risk trackers). This allows the user to predict project risks before they are fully manifested and earlier than they would otherwise be identified through traditional construction industry reporting mechanisms.

SIMULATION AND MODELING

Similar to quantitative analysis, simulations and modeling take the results a step further by not only identifying issues and potential risks, but also testing them against real-world scenarios. Using the wealth of data that should be collected using descriptive construction analytics, businesses can run simulations and models to understand the range of potential outcomes, their likelihood, and their risks and benefits. One of the more well-known and used simulations within the construction industry is Monte Carlo. As mentioned in AACE Recommended Practice 57R-09, this type of simulation has several valuable outputs, such as determining the amount of contingency to provide, identifying risks that are most important to project success, and developing a probabilistic cash flow that is impacted by uncertainties [2, p.3].

OPTIMIZATION ALGORITHMS

Portfolio optimization is an objective assessment of investments to help decide which projects to fund or defer/reject to enhance value. Using metrics, such as return on investment, benefits, budgets, risk, and priorities, businesses can use predictive analytics develop visualizations that improve the ability to standardize the investment decision process and perform trade-off analysis to improve resource allocation.

Indirectly, many capital project owners use optimization throughout a project’s lifecycle — value engineering during design, resource planning during construction, and repair selection during maintenance. With known objectives (i.e., reduce costs, increase productivity, resolve the most repair tickets), optimization algorithms can run many permutations of available data in a short amount of time and provide the best possible outcome. This type of analytics can provide capital project owners with the confidence to stand by decisions, as these algorithms can exhaust the evaluation of options under consideration.

DEVELOPING CONSTRUCTION ANALYTICS CAPABILITIES

GETTING THE BASICS RIGHT

Organizations should take immediate steps to realize data management efficiencies through construction analytics:

- Invest time in analyzing current data to improve existing operations and maximize potential business value opportunities.
- Begin to build the capability to analyze data at fundamental levels, either through staff training or “plug-and-play” technology.
- Orient future decisions around insights from data analytics for process improvements.
- Create a data management strategy to balance field use and management reporting.
- Build an overarching roadmap to address the future of technology adaptation.

Visualizations based on construction analytics provide a powerful method to understand the performance of a portfolio or even individual projects. Figure 4 describes the inputs and outputs necessary to effectively use construction analytics in project management. Successful implementation should generate the right analytics and visualizations, using existing data, which is often of varying quality and contained in multiple databases, systems, and spreadsheets. The outcomes from implementation construction analytics include:
• A unified database with standardized data compiled from multiple data sources.
• Automated, flexible extract, transform, and load (ETLs) procedures that move data from source systems to the central repository, apply quality controls, and perform checks for data integrity.
• Configured views for different users and business processes, which can be updated without extensive development efforts.

IMPLEMENTATION OF CONSTRUCTION ANALYTICS
Most businesses in the construction industry already collect data; it is just a matter of setting up the framework to run construction analytics and incorporate it into the decision-making process. The following six steps can help businesses successfully implement construction analytics, encourage its use at all levels, and extend its value as the industry evolves.

DEFINE
Decide which business problems construction analytics is intended to solve and determine the Key Performance Indicators (KPI) that could effectively track success. Ask the right questions:

- What business problems need to be solved?
- Is the focus construction, planning, design, operations and maintenance, etc.?
- How is success measured?
- What is the existing infrastructure, and how is data reported now?
- Who will be using/viewing the construction analytics tool, and for what purposes?
- What level of reporting do they plan to achieve with the information?
- What is the cadence the owner seeks to update the data?

DATA GATHERING PHASE
Identify necessary data and sources to feed the KPI calculations. The data is then collected in a central database using the following steps for ease of use:

- Extract, Transform, and Load Data – Collect and manipulate the source data manually entered from the field team to create a final standardized dataset.
- Design and Develop a Database – Create a centralized database with a data structure that minimizes redundancy and maximizes performance efficiency.
- Import to Data Repository – Once the data and database are ready, populate the database.
- Run Construction Analytics – Finally, export the data variables used to create the KPI data objects.

DESIGN PHASE
Plan out the analytics presentation by involving all levels of users and stakeholders in the design process. The following exercises can help organizations understand user needs and make analytics visualizations more relevant:

- Personas – Personas are fictional representations of key user types that represent various stakeholder needs. Personas can help summarize the major needs, wants, and uses of different user groups.
- User Journey Maps (UJMs) – UJMs plan the user’s journeys through the course of an experience. In this case, the journey maps help organizations understand users’ thoughts as they review the results of construction analytics.
- Visioning Sessions – Visioning sessions translate the personas and journey maps into realistic product concepts and, ultimately, a summary of targeted functionality and enhancements. They help determine the demand and value of features, such as visualization types, navigating between visualizations, and interacting with the visualizations (drill-downs, filtering, etc.).
- User Flows and Task Analysis – User flows describe and plan how users will move through a site. For example, a flow might be represented by a map of the US, which helps users view all projects and then drill down to the states to see individual project dashboard views.
- Wireframing – Wireframes establish page structure, navigational elements, and interaction patterns. They should include sample content and realistic field values. Wireframes also serve as the blueprint for developers to build out the construction analytics platform.

During this phase, KPIs should also be revalidated for purpose and impact to help develop a better understanding of the available data.

BUILD PHASE
Use the outcomes of the design phase to iteratively build a prototype. The platform should be updated based on user

FIGURE 4. Typical Solution Graphic
feedback during this phase. As a result of customization, the Plan-Do-Check-Act (PDCA) cycle (or an AGILE software development approach) becomes easier to implement and more relevant to users – making it inherent to project management. Similar to the AACE TCM Framework, this process embodies “continuous improvement.” This drives change in data management and reporting, while optimizing the results and, ultimately, the decisions based on this information [12, p.295].

DELIVERY PHASE
Start training users and implementing of construction analytics into the project management process. During this phase it is important to develop and finalize the reports that will be generated from the tool. During this phase, the following steps are necessary to implement construction analytics:

• Define the procedures users will perform to view the results of the analyses and to generate reports.
• Establish requirements for frequency of reporting, and format of reports.
• Host training for users to familiarize themselves with the use of construction analytics through a visualization platform.
• Set up a process for reviewing challenges and suggestions to continuously make improvements.

IMPROVE PHASE
Construction analytics is slowly embedded in the day-to-day project management process. Businesses will progress to considering what new analysis might further advance their decision making. KPIs can be constantly validated, changed, or removed. Referring to Figure 1, the improvement phase can be the point at which construction analytics moves from descriptive to predictive and prescriptive.

This phase also includes improvements to data and data management. As businesses start to understand what information is and can be useful, the processes for data entry and collection can be improved – and even moved to automation. Businesses can implement Automation at a number of points, such as export from a source system, import into a database, and import into a visualization platform.

CONCLUSION
Construction by its very nature requires and promotes a data-rich environment throughout its lifecycle. From shop drawings to material submittals, and RFIs to cost estimates and maintenance records, these components are critical in delivering impressively engineered structures. Exponential growth in modern technologies is revolutionizing the way industry works. These disruptive technologies will continue to impact how the construction industry does business – and in far a shorter timeframe than expected.

Considering the two groups of common challenges noted above, it’s easy to see how a construction analytics tool can address challenges related to data and reporting.

DATA BENEFITS
The industry faces several data management challenges: multiple data systems, a lack of system connectivity, un-prioritized and unorganized information, and largely paper-based data. Leadership often relies on multiple users compiling results from various systems. This, coupled with a largely paper-intensive process, create volumes of disparate, unstructured data. Because of this inaccurate and slow information flow, leadership may fail in making effective decisions at critical junctures.

The various stages of a construction analytics tool development process (as detailed above), address these challenges by:

• Developing a data repository that collects data from a multitude of sources to feed into the construction analytics tool. This repository will eliminate the need to “hunt” through various systems for data in support of KPIs. Additionally, the repository will increase the reliability of the data through redundancy checks.
• Connecting disparate systems to significantly reduce workloads. This will allow project teams to focus on project delivery instead of data management and allow leadership to review key project information without using multiple reports.
• Collecting data from paper documents. The tool will help businesses realize which data points are collected via paper documents and determine how to best transition that process to electronic data collection. The data repository will allow users to view project information electronically that only had been available in paper format.
• Providing the option to use ETL tools and programming languages (e.g., SAS, Python, R, SQL, and Hadoop) for organizations looking to complement, not replace, existing software networks, with robust, integrated data analytics capabilities
• Establishing clear business rules and workflow for hierarchy of information. For example, if two systems show different budget values, which one takes precedence?
• Automating data extraction from systems. This automation will reduce user workload and the “human error” component of data entry.

REPORTING BENEFITS
The industry faces several challenges related to reporting, including repetitive and inefficient reporting, increasing demand for transparency, siloed project accountability, and digestible results. Without accurate, clear, and concise reports, a business will struggle to identify problem areas and risk, ultimately causing project delays or cost overruns.

Development of a construction analytics tool can alleviate the challenges of ineffective reporting by:

• Highlighting previously unknown risks discovered by the analytics tool that were difficult to uncover “with the naked eye.” An analytics tool has the flexibility to display data in multiple formats, which allows users to interpret data and find trends that might not have been possible to see using individual data sources.
• Visualizing data that could potentially overwhelm business owners and instead help them successfully run their businesses. Through the use of images, interactive technologies and spatial, temporal, and social network displays, visualizations take advantage of how our brains are wired to help unlock data and reveal hidden patterns. Using color, shape, size, location, and direction, large amounts of data can be presented at one time.
• Generating consistently formatted reports. Leadership may have seen reports with different data in different formats for similar projects. They will now have consistently formatted reports to quickly compare similar projects and implement lessons learned. This will also make report production less intensive.
• Making the construction analytics tool readily available for leadership to view. A construction analytics tool will always be accessible and have near real-time information. This will allow leadership to view portfolio or project information without waiting for a report to be provide. This will help them make faster business decisions with confidence.
The construction industry is in the “golden age” of technology. Advancements in finance platforms, Internet-based sensor technology, unmanned vehicles, cloud-based solutions, and analytics capabilities are converging to provide an abundance of data for capital projects. This creates opportunities to develop deep insights into project performance. The use of technology is a critical enabler in collecting, structuring, and integrating information for more efficient delivery and operations in capital projects. There is an opportunity to employ technology to leverage millions of dollars in delivery and operational savings. A construction analytics tool can turn project risks into confidence and allow for proactive management to help prevent future cost overruns, schedule delays, or quality issues.

REFERENCES


SUBMITTING SECTION NEWS: We invite all sections to submit news and updates to be included in the International Bulletin section of each Source issue. Please submit any and all text as a part of the e-mail or as a Microsoft Word file attachment. Please submit any photos as individual attachments in 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). For photos to be published, they must be in focus, of print quality, and of sufficient resolution.

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. 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. 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.

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Submission Dates Publication Date
Aug. 16 - Oct. 15 February
Oct. 16 - Dec. 15 April
Dec. 16 - Feb. 15 June
Feb. 16 - April 15 August
April 16 - June 15 October
June 16 - Aug. 15 December

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.)

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ARABIAN GULF SECTION
The Arabian Gulf Section participated in a workshop on Life Cycle Costing organized by the College of Environmental Design at King Fahd University of Petroleum & Minerals, Dhahran, on Monday, Nov. 13, 2017. Dr. Madhu Pillai delivered a technical presentation on "Life Cycle Costing" and Mr. Bader Saleh delivered an introductory presentation on AACE International and the Arabian Gulf Section. His presentation discussed AACE activities, such as the certification programs, membership and its advantages, etc.

Right: Bader Saleh delivered a lecture about AACE International and about the Arabian Gulf Section at the November 2017 Arabian Gulf Section meeting.

Top right: Dr. Adel Al-Dossary, Dean of CED, at the King Fahd University of Petroleum & Minerals (KFUPM) poses with attendees at the November 2017 section meeting of the Arabian Gulf Section.

Bottom right: At the November 2017 Arabian Gulf Section meeting, Dr. Madhu Pillai, is shown presenting a lecture titled, "Life Cycle Costing."
The Arizona section board met on Sept. 14, 2017, at RLB’s office in Phoenix. Incumbent board members attending included Section President Charlene Mendoza, Director Membership Steve Vergara, and Director Academics Jim Oswell. The board welcomed incoming board members Director Programming Shana Solomon and Secretary Jesse Zunke. Topics discussed included board member roles and responsibilities, recent section scorecard changes, and the Region 5 Symposium in the fall. Additional topics included technical meetings speakers and schedules, member recruiting events, and student engagement opportunities. The 2017-2018 Arizona Section board looks forward to another successful term!

The Aurora Edmonton Section met Nov. 15, 2017 for a dinner meeting with the guest presenter being AACR President Charles E. Bolyard Jr., CFCC PSP FAACE. The 6 p.m. meeting was at the New York Board room at the Stantec Building in Alberta. Bolyard spoke on Lean Approaches to Project Design and Delivery. The foundation of the “Lean” initiative, as it relates to design and construction, is collaboration, communication, and mutual respect. Another way to look at Lean is that it places emphasis on what at all times best serves the project, as opposed to what might best serve the interests of any one or more stakeholders at any point in time. Lean focuses on maximizing value and eliminating waste. Lean is a set of tools and processes that facilitate collaboration and support success through all phases of a project. In its broadest application, Lean can be utilized on any undertaking. Lean has application that extends far beyond design and construction; it is a different way of thinking, a different cultural approach to delivering projects across any industry. Albert Einstein is quoted as saying “Try not to be a man of success but a man of value”. This philosophy is at the very heart of Lean and embodies all of the associated concepts. Join us for an interactive discussion of the underlying precepts of Lean. Mr. Bolyard became President of the Association in June 2017 and has served previously served as a Regional Director, Chair of the CFCC Certification Committee, Co-Chair of the Certification Board, and Vice President – Certification. He has been an active member since 1991, and is a two-time Past President of the National Capitol Section. Mr. Bolyard has achieved AACE’s PSP and CFCC certifications and was named a Fellow of AACE in 2010. Mr. Bolyard is a consultant to owners, contractors, and architects/engineers that are involved in the performance aspects of design and construction, and provides expert analysis/testimony in addition to litigation support.
**BRAZIL SECTION**

The 5th Annual Meeting of the Brazil Section, a two day event, was conducted in Rio de Janeiro starting on Dec. 1, 2017. Shown above from the left are: Angelo Valle - ICEC Technical Vice Chair; Filipe Alves - Brazil Section President; John Livengood – AACE International Past President; and Aldo Mattos - ICEC Reg.1 – Marketing. Aldo is also a past president of the Brazil Section. Paulo Dias (ICEC Region1 Director) was honored and acknowledged at this event.

**HOUSTON GULF COAST SECTION**

The Houston Gulf Coast Section met Dec. 12 for its final meeting of 2017. Kenda-Le Pernin, a senior consultant with Mark Kamin and Associates, delivered an excellent presentation on creating high performing cultures. She critically examined how performance is a function of culture. She went on to share highly relevant insights into how organizations that implement their methodologies create a deliberate, intentional and transformational culture that fulfills the future of the organization. Several of her flagship clients have had major successes in operations management specifically in the areas of cost reductions, team cohesion, operational efficiencies and overall performance.

On Nov. 14, 2017, at the Houston Gulf Coast Section monthly meeting, Phil Haven gave a presentation titled, “Project Controls – The Next Generation.” He led a thought provoking discussion on the responsibility of senior project controls, capital veterans, in the mentorship of the next generation of project professionals. He is experienced with owners and teams in all phases of project development/execution. He gave examples on how young engineers can quickly be involved on a project by being tasked with putting together the monthly project report, for example, to ensure they interact with all team members and understand each person’s role.

**MONTREAL SECTION**

The Montreal Section enjoyed an excellent presentation by Yvon Chabot entitled, “ICMS: The Standard Presentation of Construction Costs,” on Dec. 12, 2017. Over 30 attendees braved the snowy winter weather to enjoy this discussion at the Hydro-Quebec offices about the new International Construction Measurement Standard (ICMS). Mr. Chabot is a Professional Quantity Survey (PQS), lecturer in construction economics at École de Technologie Supérieure (ETS) and director of education for ICEC-Quebec and president of Groupe Schema. He is also author of the book entitled, “Construction Budget - Uniformat II Application Guide for Construction Budgets.”

Mr. Chabot discussed the collaboration between 45 professional and not-for-profit organizations from around the world (including AACE International) known as the International Construction Measurement Standards Coalition (ICMSC) to provide a unique international standard breakdown and methodology for construction projects. ICMS can be used as the standard for estimating, cost reporting, facilitating of the collaborative potential of technologies such as BIM and databases and enable a reliable and consistent presentation of project construction costs globally.

**At top:** At the December 2017 meeting of the Houston Gulf Section, Kenda-Le Pernin, a senior consultant with Mark Kamin and Associates, delivered an excellent presentation on creating high performing cultures.

**Above:** For the sixth year in a row, the Houston Gulf Coast Section participated in a Houston Food Bank Drive in November and December that resulted in providing 2,541 meals for Houston area families. This exceeded the section’s goal of providing 2,500 meals. Special thanks to all HGCS members that participated. Shown above from the left are: Trey Seabrook, HGCS Director, and Yemi Ibiyemi, HGCS President.
The presentation included a review of the new standard coding structure. Examples were given of the level of detail and how it can be used for overall estimates and cost comparisons, feasibility studies and development assessments, planning and cost control, supply and analysis of offers, audits and dispute resolution and evaluation of assets and liabilities.

One of the most high-profile projects in Montreal is the new Champlain Bridge that is currently under construction, a 3.4 km span connecting the island of Montreal to the South Shore. It is one of the largest projects of the last 40 years in Quebec. The Champlain Bridge is also one of North America’s busiest spans. The project includes the new bridge, as well as other significant access and roadwork collectively known as the New Champlain Bridge Corridor Project. The Signature on the Saint Lawrence Group was selected to carry out design, construction, financing, operations, maintenance and rehabilitation under a public-private partnership (PPP) agreement with the government of Canada (www.newchamplain.ca). The Montreal Section was very pleased to enjoy a presentation entitled, “Earned Value Management in PPP: Case Study Champlain Project,” on the construction of this world class project on Nov. 7, 2017, at the Samuel Bronfman building of Concordia University. With 80 in attendance, it was the best attended presentation in 2017. The presentation was in two parts: the first part included a discussion by Mr. Felix Möller, civil engineer, construction management expert and planning manager for the Signature on the Saint Lawrence Construction (SSLC) group on the fabrication and construction methods for the project along with a video. The second part was on earned value measurement (EVM) and methods used to assess progress. This was presented by Mr. Izaat Moussallieh, M.Sc., PMP, with extensive experience on PPP projects, as well as EPC/EPCM projects and the project controls manager for SSLC. The presentation commenced with a fascinating look at the new Champlain bridge project scope and construction methods followed by an overview of EVM principles and its application in PPP projects, as well as baselining and forecasting methodology. There was excellent audience participation during the question and answer period. At the start of the meeting, the Montreal Section was very pleased to award local scholarships to two recipients, Mikail Shapoory Arani from Concordia and Malika Ouiriemmi from Ecole Polytechnique. Well done to both! Thanks to our distinguished speakers, our host and Section President Hagire Emrani and to Concordia University Professor Osama Moselhi and Professor Mazdak Nik-Bakht for sponsoring use of the facility.
The Norway Section hosted its 4th annual conference Nov. 2, 2017. A record-breaking 120 participants signed up for the event at Aker Solution headquarters in Oslo. The Norway Section aims to strengthen the skills and knowledge within cost estimation, cost control and planning in Norway. These annual conferences are one of the main pillars in achieving this - together with other activities like courses, certification workshops and other networking events.

This year’s theme was different aspects of risk – were the main goal was to highlight the main challenges of risk management and contingency estimating, as well as uncovering tools and simplified ways of coping with risk in projects or business life. The section was honored to have John K. Hollmann of Validation Estimating (USA) to give the keynote speech about “Methods That Work” after an introduction by section President Lars Stenberg Berg of Metier AS, Hollmann introduced “Project Risk Quantification, Challenges of Risk Quantification and Top 10 Reasons Why This Fails” – which really set the agenda for the day. Otter Nordnes of Aker Solution presented “Parametric Methods for Contingency Estimating in Aker Solutions” and risk management software provider, Safran, presented “Integrated Cost and Schedule Risk Analysis” and giving a demo of their updated product. Last but not least, Einar Hübert and co-writer of the presentation Håvard Skaldebø of Meier AS, rounded off the day with “Behind the Façade of Project Risk Management” using examples from their careers and from around the world where things have gone wrong. New of the year was also an exhibition area where participants could mingle with suppliers of risk management tools like Oracle PrimaVera, Safran Risk and Sword Active Risk Manager (ARM) during breaks. The event was a great success and shows how the Norway Section helps gather people and raises awareness of estimation and project management disciplines in Norway. Thanks to everyone who made this day a success!
Brian Criss, PSP, a Principal and VP of Business Operations with DR McNatty, presented the technical presentation for the Southern California Section’s November 2017 meeting. His topic was, “Schedule Review Techniques Using Primavera P6.”

## SOUTHERN CALIFORNIA SECTION

On Nov. 14, 2017, the Southern California Section met for a presentation titled, 'Schedule Review Techniques Using Primavera P6'. The presentation discussed techniques to help the review and evaluation of P6 schedules as submitted by contractors. It was presented by Brian Criss, PSP, Principal VP of Business Operations of DR McNatty. Brian has over 18 years of field experience in construction management and project controls. There were 32 in attendance at the event, including four students.

## ST. LOUIS SECTION

At 11 am on Nov. 16, 2017, the St. Louis Section conducted a monthly meeting at the office of Alberici Constructors. There were 13 attendees in a video teleconference with Stephen Hollstein, a Project Controls Engineer at a Monsanto in Luling, LA. He explained various features of the Acumen Risk Management Software and how it was very useful on a large project at that chemical plant. At noon on Oct. 10, 2017, seven board members of the St. Louis Section met in the office of the Project Controls Group to discuss a list of topics for monthly meetings to be conducted in 2017 and 2018. The topics for the meetings were finalized the following week and a program was sent to all the members in the section.

## TURKEY SECTION

The Turkey Section was chartered on 10 June 2017 during the AACE International Annual Meeting in Orlando. The section was established with five founding members and as of end of October 2017; the section has reached 9 active members. A majority of the Turkey Section members gathered on 24 October 2017 at Istanbul for a Risk Training Workshop organized by Palisade. During the risk workshop, section members obtained new insights on risk and decision analysis after having a good overview of @RISK and Decision Tools suites. Palisade is one of the existing Approved Education Providers of AACE International. Also some of Turkey Section members and some previous AACE members from Turkey gathered another event, reducing costs and increasing efficiency in Construction Disputes, in Istanbul on 26 October 2016 organized by the Turkish Contractors Union, CMS and HKA. The event was successful and participants obtained insights about the lifecycle of construction disputes, effective use of quantum and delay experts, resolving disputes under the new edition of FIDIC suite of contracts and International Chamber of Commerce (ICC)’s expedited arbitration proceedings. The Turkey Section has a goal to double the number of section members in 2018. In the meantime, Turkey Section members are also launching AACE certification courses in Turkey.

## DOES YOUR SECTION HAVE NEWS TO SHARE?

See page 30 for complete instructions for how to submit news and photos from your Section’s happenings to be included in the AACE® International Bulletin.
THE AACE INTERNATIONAL 2018 ELECTION

Have you cast your ballot yet?

The 2018 AACE International Board of Directors election is under way and the current board is issuing a reminder to all eligible members to beat the March 15 deadline and cast votes for the offices on this year’s ballot. The ballot was posted online on February 1, and voting will continue until 4 p.m. Eastern US time on Thursday, March 15.

CLICK HERE TO VOTE

… or log onto the AACE website at web.aacei.org and click the election icon that is posted on the homepage to view biographies of each candidate, photos, and each candidate’s goals for the office they are seeking. The online system is designed to give members the designated ballot for their region, based on whether their region is electing a Director Region candidate this election cycle. Individuals who were on the AACE membership roll as members as of Dec. 31, 2017, are eligible to vote in the current election. Anyone who joins after Jan. 1, 2018, is not eligible to be added to the voter list, or to vote in the 2018 election.

If you encounter any problems accessing a ballot or question if you have received the correct ballot, stop before completing the online voting process and contact AACE Headquarters for assistance. You will need your AACE member number and password to log in. If your member number has fewer than six numbers, add one or more zeroes in front of your member number to create a 6-digit number.
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Upcoming Events

FEBRUARY 2018

1. CMAA OWNER’S NIGHT
   The Grand Event Center
   Long Beach, CA
   www.cmaasc.org

2. WOMEN IN THE BUILT WORLD SYMPOSIUM
   University Center, 525 S. State Street
   Chicago, IL
   www.seaoi.org

6-8. 2018 INTERNATIONAL ROOFING EXPO
   New Orleans, LA
   theroofingexpo.com

15. SEAOI SEMINAR: ANCHORAGE TO CONCRETE
    University Center, 525 S. State St.
    Chicago, IL
    www.seaoi.org

MARCH

2. CHICAGO TRADE SHOW AND SYMPOSIUM
   University Club, 76 E. Monroe St.
   Chicago, IL
   www.seaoi.org

4-6. SPS INDUSTRIAL AUTOMATION FAIR
    Guangzhou, China
    www.spsinchina.com

APRIL

26. THE 15TH ANNUAL SEAOI MIDWEST BRIDGE SYMPOSIUM
    Maggiano’s Little Italy, 111 W. Grand Ave.
    Chicago, IL
    www.seaoi.org

26. CMAA SOUTHERN CALIFORNIA CHAPTER AWARDS GALA
    InterContinental LA Downtown
    Los Angeles, CA
    www.cmaasc.org

MAY

18. ETHICS FOR ENGINEERS ASSOCIATION FORUM
    10 S. Riverside Plaza #800
    Chicago, IL
    www.seaoi.org

JUNE

5-7. AEC NEXT TECHNOLOGY EXPO AND CONFERENCE
    Anaheim Convention Center
    Anaheim, CA
    www.aecst.com/conferences/june-2018-anaheim-ca

24-27. AACE INTERNATIONAL’S 2018 ANNUAL CONFERENCE AND EXPO
        Manchester Grand Hyatt
        San Diego, California, USA
        PH: 1-304-296-8444 | FAX: (304) 291-572
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        web.aacei.org

SEPTEMBER

23-26. THE 7TH IBPC INTERNATIONAL BUILDING PHYSICS CONFERENCE
        Syracuse University
        ibpc2018.org

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

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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 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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EVP CERTIFICATION STUDY GUIDE, 3RD EDITION
Sean T. Regan, CCP CEP FAACE - Editor, 2015
This study guide is intended to assist you in your study and review of the overall topics as one step toward successful Earned Value Professional certification. The outline provides a listing of the terms you should know & topics for which you should have a good understanding of how to apply the concepts to solve problems. Each chapter also contains sample exercises, which test your knowledge of that chapter’s concepts.

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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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COST ENGINEERS’ NOTEBOOK
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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COST ENGINEERING

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Turning Around Problem Projects
FIRST PRESENTED AT THE 2017 ANNUAL MEETING AS PM-2605
BY JOSEPH A. LUKAS, PE CCP

Hot Tubs and Other ADR Remedies for Disputes that Ail You
FIRST PRESENTED AT THE 2017 ANNUAL MEETING AS CDR-2608
BY KATHLEEN OLDEN-BARNES, CHRISTOPHER J. BRASCO
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