Director’s Welcome

Welcome to 2019! New Year, new opportunities. We have a new newsletter editor, Willy Garcia. Many thanks to him for stepping up. We have a new ISA President and Executive Director with a lot of new ideas. (Gee… how many times can I say “new” in this write-up?) Lastly, we are always looking for new people, new thought, and new content to share with the larger ISA Construction & Design community.

My goals for this year, my last as your Division Director, are to increase our membership and find ways to generate outside revenue in order to provide more benefits to the members. While some of your membership dues go to the divisions you support like this one, most of a divisions budget is dependent on symposiums and the revenue that they generate. Our first attempt, ISA@Montreal, was a success in terms of programs offered, but I believe we fell short of our targets for participation. The two training events were cancelled for lack of signups. (I was going to attend one myself and was disappointed.) The ISA board recognizes this problem and is working with all of the divisions on ways to increase participation of not only members, but everyone in the automation world, including corporate sponsors.

With the new year comes new corporate budgets for training and events. Now is the time to start requesting some of that for your own professional development. Can’t travel but have a large automation community near you? Let us know and we can bring a symposium or other event to you and work with your local ISA chapter. Work for yourself? Take a quasi-vacation and write it off! Not sure where to start? Shoot me an email and we'll figure it out together. I want to help you get the most out of your ISA membership and this division in particular. All I need is a notion of what you all need.

Again, welcome to the new year, and welcome to the Construction & Design division. Let’s make this year a great one!

J Parsons, PE

j.parsons@jacobs.com
Newsletter Editor’s Welcome
Willy García, Flopower

Welcome to our Winter 2019 Newsletter! I have been honored to take part in this effort of delivering a new newsletter edition. Thank you very much to J Parsons and Ray Vandale for taking me on. I am confident we will have a great year.

In this issue, you will find a very interesting article about “Ageism.” It is one of the new challenges we must struggle to overcome in our projects every day. There are also some highlights of FLM/Montreal symposium, which it was our first symposium and a great experience.

Also, you will see another useful article about industrial automation projects. As they are sophisticated by nature, there are some special aspects that you need to consider if you want to achieve a successful project.

Further, there is a book recommendation to complete your bookshelf: A Guide to the Automation Body of Knowledge, third edition. This book contains field expertise and knowledge of key concepts and processes in industrial automation as well as the abilities needed to become an expert in them. I have also included two CAP exam questions to test your knowledge.

Finally, in this issue, you can find the contact information of our division leaders at the end of the newsletter. Should you want to share some ideas or ask for advice, please contact us.

Thank you for being involved with ISA. May this new year bring new goals, new achievements, and be filled with success and prosperity for you.

Willy García

Director Elect’s Welcome
Ray Vandale, SMV Consulting

Welcome, everyone, to a New Year! I would like to thank Willy Garcia for stepping up and taking over the Newsletter. Willy brings a refreshing addition to our team of volunteers and I look forward to working with him towards what promises to be a most productive year within our division. I would like to offer up an interesting topic that I’m sure you will all agree is very prevalent to our industry culture these days and I hope you find constructive incite within this article.

“Ageism”

“We are the only “ism” that everyone (who lives) will live to suffer from.”

This statement within “Dictionary.com” truly epitomizes what I believe is a growing challenge in our evolving culture. Being on the tailing years of my career, I can now look back to situations of ageism I have witnessed in the past and am still witnessing today. Today, my team leads are in their millennial years and are composed of very bright engineers on the cusp of new technologies and mythologies changing how we effectively execute projects.

As with many projects, a key component to success is still having that field experience to ascertain risk triggers that may negatively impact the project.

This is where the balance of good communication, collaboration, and ego's left at the door come into play.

Throughout my years in industry, I have attended many courses on generation stereotyping. These were attempts to help our team and leadership groups better understand that every team is comprised of individuals that all offer varying degrees of empathy, leadership, drive, and collaboration.

This article by “Nicole Gallucci” best exemplifies the challenges I am speaking to. It is not my attempt to single out anyone within the generation norms, but rather offer up some insight towards challenges we are all facing in our day to day progression.

Ray Vandale
Ageism is becoming a major issue for corporations

LEADERSHIP LAB
NICOLE GALLUCCI
SPECIAL TO THE GLOBE AND MAIL
PUBLISHED MAY 1, 2018
UPDATED MAY 2, 2018

Partner, FUSE Marketing Group Inc.

In an era of inclusivity and diversity, ageism is growing as one of the new challenges that businesses face. Ageism is defined as "prejudice or discrimination on the basis of a person's age."

A recent study by Spherion found that roughly 25 per cent of employees make judgments about their co-workers' and supervisors' abilities to do their job based on their age alone. This rate is as high as 39 per cent among millennials, higher than any other generation. The research also identified that, in 2017, 69 per cent of younger workers lack the business and life experience required for leadership positions. As a business leader in my early 50s, I see and feel the impact of age, expectations, and management styles, and I'm regularly challenged to manage issues and differences across the age spectrum in the workplace.

While millennials often have greater tech skills, having grown up with devices in their hands and easily adapting to changing technologies, boomers and Gen Ys are technically savvy, often thanks to the teachings of the youth in their workplace. However, what more-seasoned generations bring to the boardroom table are life and business wisdom, and the resiliency to weather the unprecedented pace of change. This interesting balancing act was never more apparent than at the recent 2018 South by Southwest (SXSW) conference.

An annual event featuring content in the unique and converging interactive, film, and music industries, this year's SXSW added panels on the topic of ageism to its roster. The age range of attendees, both young and old, was broader than ever before. While there were discussions surrounding the #MeToo movement, there was a strong sentiment that we are on the precipice of the creation of an ageism hashtag that will raise awareness of the need for inclusivity and diversity at all ranges of the age spectrum. The challenge is managing both a generation that wants to race up the ladder, skipping rungs, with another that has climbed up rung-by-rung.

In both the SXSW discussions and current workplace discussions on the rise of ageism, some themes are predominant and worthy guideposts for managing leadership's challenges and opportunities.

AGEISM IS NOT AGE SPECIFIC

Ageism is being experienced across the spectrum. Both demographics at either end claim they are misunderstood.

I recently watched my team evaluate a multitude of candidates for a position. There was a concern that "older" candidates were too experienced, while "younger" candidates lacked sufficient knowledge and "been there, done that" experience to provide the necessary confidence needed in the role.

We not only have to fill gaps with candidates that can fulfill the present job, but with an uncertain future, we need to find candidates who can roll with the punches. This is less about age and more about personality.

AMBITION AND DEVELOPMENT SPRINGS ETERNAL

The desire to grow, learn, explore, and develop personally and professionally is common to every age. While quick to offer development plans for the younger generation, we are often remiss in ensuring our aging demographic remains sharp and motivated. As the population ages, development plans across all ages and stages of life and work need to be offered and implemented.

LEAVE YOUR BAGGAGE AND YOUR EGO AT THE DOOR

While this cliché rings true across a broad range of situations, it is perhaps most apparent in business, particularly with millennials and boomers. Given the two groups often experience parallel age-range challenges at home (parents versus kids), sometimes the dynamic extends to the boardroom. The kitchen table and the boardroom table are not the same. There are very different expectations and accountabilities in the boardroom, where the groups are peers and partners. With increasing, fast-paced requirements placed on businesses, it takes an egoless team of minds to keep
up, let alone grow sustainable businesses boasting a competitive advantage.

**EXPERIENCE IS KEY**

Honor the demands of the opportunity at hand and consider nimble work teams that shift as requirements shift. The selection of team members should be designed to meet the objectives and who best to deliver them. It could be argued that in understanding the adoption of new tech, a team that skews younger may provide more relevant results. However, as the opportunity commercializes, the project may need to transition to suit an older team who have likely experienced a multitude of business models.

In conclusion, there are yin/yang benefits to optimizing the age spectrum. While not everyone may see this experience spectrum as clearly, I am immersed, both physically and mentally.

At one time, I worried about a glass ceiling; I now evaluate whether a glass floor exists, run by a younger generation who – in the adrenalin rush of the new – lose sight of the value of business experience, which can help to weather the highs and lows caused by “always new” and “always on.”

As I reflect on our own organization, I wonder if the generations within our company are as aware and respectful of the need for and benefits of age diversity. On one end of the experience spectrum, my team is predominantly composed of 20-to-30 year-olds who share the latest app, technology or new haunt on a daily basis. On the other end, a 76-year-old mentor, who still comes to work every day and methodically evaluates the firm’s long-term business plans, oversees corporate governance and always adds a new idea or approach to any business or client challenge we share.

As the number of years we spend in the workplace evolves, it will be interesting to note – and participate in – in how different generations respect, leverage and learn from each other’s talent. It is the dawning of the age of experience, and both ends of the spectrum have much to offer.

**Ray’s Do’s and Don’ts**

When hiring new employees or picking team’s, **DO** consider all aspects of their experience and training to ensure that this individual is the right fit for the position and will offer the best solution.

**DON’T** be plagued by ageism and deny yourself the most righteous solution and contribution towards your team.

Ray Vandale

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**Highlights of FLM / Montreal 2018 Symposium**

J Parsons / Ray Vandale

Hello CONDES,

I’d like to start with a huge thank you to Naidu and everyone else involved with the symposium. In my view as both a speaker and as an attendee, I think it was a great event. Our tracks were well attended, and all the speakers were glad to be invited. Before the symposium, we had the Division Awards Luncheon and Honors and Awards Gala. At the luncheon, the CONDES division received the Industries & Sciences’ Communication award. This is a nice acknowledgement of the work we’ve done on our newsletter and in the communication efforts between ourselves and our members. While we did not win the Division of the Year award, the nomination alone speaks to the efforts everyone has put in this year, and I was honored to stand with the other honorees on stage on behalf of you all.

We kicked off the leaders meeting with a talk from our incoming ISA President on the importance of succession planning and recruitment. I’m happy to say that we have a Director-Elect-Elect lined up for 2022, but we need to start thinking about other positions. Many of you, like me, have been slammed with projects and may not be able to continue in your current role, and that is ok, but I need your help finding others to take up the reigns.

Maybe you have a junior person in your group who is just starting and needs some opportunities to show their stuff. Get them involved!

Thanks,

J
Discussion Groups and Networking.

The Construction and Design Division (CONDES) is shaped by professionals, technicians, and students in careers related to automation systems and instrumentation, involved in design, construction, and commissioning activities in all types of industries and facilities.

The members of this division share a common objective: improve knowledge and skills in this exciting area. Therefore, it’s important to stay in touch with colleagues to collaborate and learn from each other.

Keeping in touch with colleagues in the area is useful, and very important for increasing your knowledge and improving your skills. Remember that alone, you are faster but working in a team, you will go farther!

For this purpose, Condes Division has a LinkedIn group. If you are a member, find it within the following link:

https://www.linkedin.com/groups/12011693/

Visit us online!
CONDES Website
www.isa.org/condes/

If you are not already a member of our section, please upgrade your membership and join us.

The LinkedIn group is used for many activities: share experiences, ask for advice to solve a problem at work, talk about a new solution implemented, case studies, give advice about technical material, share and comment on some technical articles in the area, etc.

Remember, it can’t hurt to ask.

“\You know, I could use a little help on...”\n
Do you already volunteer a lot in our Section? Would you like a little help? Just ask!

When you’re talking to another Member, why not ask for a bit of help? Or make a few phone calls? Our Section has plenty of jobs—and plenty of Members. Maybe some Members just need a little nudge to get started.

Ask for help today!
The seven special aspects of automation projects for project managers

Considerations for success

By Dzhamshid Safin, PhD, PMP
Source: InTech magazine (Nov-Dec 2016)

Introduction

Industrial automation projects are sophisticated and have special aspects that should be considered for the execution to succeed.

This article analyzes and shares some of the following points:

- Industrial automation projects as a combination of construction and programming
- The multidisciplinary nature of automation projects
- Lack of time reserves
- Commissioning as a significant and particular part of an automation project
- Importance of team member qualifications
- Scope definition
- Peculiarities of the start up phase

Figure 1. Aspects of automation projects
Source: InTech magazine (Nov-Dec 2016).
These peculiarities may be obvious to some people, but for others they may not be so easy to identify. This is especially true for project managers who are not familiar with industrial automation. Moreover, this is definitely not a complete list of specific aspects of automation projects, but rather insight into some of them.

Full comprehension of these processes makes a project manager’s life a little bit easier.

1. Combining construction and programming

Automation projects include various types of activities in different areas, but the interdependence of construction and software development deserves to be highlighted.

Both are important, but there is usually a lack of mutual understanding between the construction specialists (supervisors and installation engineers) and the programmers. It is clearly not an easy task to be proficient in both areas, but definitely valuable for a project manager.

Neither construction nor programming should be neglected, or the project could be in danger. For instance, all benefits of a sophisticated and advanced proportional, integral, derivative control could be devalued by an electromagnetic noise in the measurement circuit due to the wrong cable installation.

Another example is a control loop with an accurate sensor and precise valve actuator that is completely useless because a programmer reduced the accuracy by using the wrong variable type.

Therefore, it is very useful for a project manager to develop his or her own expertise in these areas or at the very least have one member on the project team who is experienced in both areas.

![Figure 2. Automation project as a combination of construction and programming](Source: InTech magazine (Nov-Dec 2016).)
2. The multidisciplinary project

Automation and control projects are almost always supposed to be done with intensive cooperation from a large number of disciplines, such as instrumentation, electrics, fire and gas, process, and information technology. An automation engineer should be proficient enough in areas like the instrument range, type of signals, accuracy of sensors, and loop calibration methods. Furthermore, almost all the equipment (e.g., valves, motors) are energized by electrical panels that often have their own logic, automatic protections, parameters, and set points.

The members of an automation team have to know all the important details of the electrical part of the project to avoid future problems.

For similar reasons, the automation project team members should not only be in charge of the automation, but it is also necessary for them to scrutinize all other parts of the overall project. To be able to do that, they must be proficient in other disciplines that are closely related to the overall process of an automation project. Otherwise, a misunderstanding between various discipline specialists and inevitable discrepancies between different parts of the project (electrical, instrumentation, fire and gas, process and automation) could endanger the automation project.

Figure 3. Multidisciplinary nature of automation projects
Source: InTech magazine (Nov-Dec 2016).
3. Automation projects lack time reserves

The vast majority of automation projects are included into bigger projects (construction/revamping), and the most significant parts of the work are performed at the very final stage of the overall project. Consequently, time scheduling and time management for automation projects are extremely critical, since the costs of delay are very high.

The closer to the startup time of the project, the more pressure there is for team members. In normal practice, the person who initiates and funds the project is referred to as the “client” even for an in-house project. Unfortunately, due to human nature, clients tend to blame all delays on the most recently involved party, which is the automation team in this case. A project manager, as well as the team members, should be ready for these stressful conditions and follow these tips:

- Define the scope of work as accurately as possible
- Define all the prerequisites for other mandatory systems and disciplines (e.g., completeness of civil and piping works and the electrical power supply)
- All blocking points from third parties (e.g., construction readiness, delays in deliveries, lack of the required client personnel) should be recorded and highlighted to a client (as officially and formally as possible)
- Identify the responsible people, who preferably would accept the project’s deliverables and who would agree upon all of the acceptance procedures
- Think how to keep the team members at a good performance level in such a stressful environment.
- Define overtime conditions and benefits.

Of course, it is better to avoid delays if possible, but it is the responsibility of the project manager to be ready to protect the team from unreasonable accusations of failing to meet construction deadlines. Moreover, a project manager should be ready to show and explain to a client very clearly all of the reasons for delays that are not part of the automation team’s responsibility.

Figure 4. Automation projects are usually a final part of construction projects and lack time reserves.

Source: inTech magazine (Nov-Dec 2016)
4. Commissioning phase

This is the most significant and probably the most important part of the overall project. During this stage, almost all of the problems (mistakes in design, engineering, procurement, and installation) are discovered.

The automation project team members almost always become the most important part of the process at this stage. They are usually involved in troubleshooting with the other disciplines, and hence they have to share their time between their scope of work and solving some of the unexpected problems in other disciplines. It is important for a project manager to try to either avoid such distractions of the team members or at least get approval of an appropriate schedule with additional time available for the team members.

Figure 5. Communications of automation team during the commissioning stage
Source: inTech magazine (Nov-Dec 2016)
Some other features of commissioning are:

- Automation team members have to maintain a large amount of communication.
- Estimating the duration and the human resources required is not so easy, due to the high level of uncertainty, especially at the beginning of the project.
- It is very hard to reduce the duration of this phase simply by increasing the number of specialists.
- Team members who will be involved in the commissioning should be admitted and included in the project as early as possible (ideally at the design stage).

Considering these peculiarities helps to avoid typical problems like overloading team members with information and communication, lacking human resources at the final stage of the project, and underestimating time limits.

5. Team member qualifications

The cost of programmer mistakes is very high due to the time constraints of an automation project. There is simply not enough time during these projects to fix and repair the mistakes of unqualified engineers and programmers. The importance of the qualifications of the team should not be underestimated. It is better to spend money on preventing mistakes, which unqualified specialists could and most likely would cause in the later stages of the project, than spend it fixing them.

Besides all the required technical skills—such as knowledge of the specific control systems, expertise in related disciplines, and experience in the particular industry—a potential team member should be able to work under pressure and have basic knowledge of project management (e.g., ability to create and follow schedules, ability to communicate properly).

An automation team usually does not consist of a large number of members. Hence, a project manager should take a chance to establish a trustful and deep relationship with each member. This improves the team’s efficiency and motivation immensely. If the project manager pays attention to the proper qualification and motivation of team members, he or she will avoid difficulties such as losing time for intensive software debugging, scope creep creating additions to the project, and lack of communication between all involved parties.

**Figure 6.** Optimal and real automation project execution

*Source: inTech magazine (Nov-Dec 2016)*
6. No project scope definition

Unfortunately, the scope definition for automation projects is often passed over as an outline. The technical specifications for the control systems often contain a lot of standard sentences and phrases (e.g., “in the most effective way,” “user-friendly interface,” “function should be automatic”) without any clear explanations of the meaning of these words.

This creates an opportunity for various interpretations, and subsequently leads to misunderstandings, as well as troubles during the work submission and acceptance.

Therefore, it could be very useful to define and to approve the technical specifications for systems, the scope of work, and especially procedures for acceptance as early and clearly as possible.

Otherwise, a project team could face a situation where the client demands the work to be done regardless of the specifications, but no one knows what exactly it would mean, including the person that initiated and funded the project.

7. First the startup

Very often at the latest stages of the whole project, the only goal the client has is to start up, to push the “magic button.” Therefore other aspects of the project, such as safety, reliability, reporting, and the human-machine interface, are neglected or overlooked.

The most important drawback of this situation is that after a successful startup a client is usually not motivated to finish all of the remaining work quickly.

Moreover, in this case the client has much more free time to study all the issues in detail, and as a result, there are many requests for modifications. The situation for a contractor is the polar opposite.

He or she is looking forward to finishing the project as soon as possible. Therefore, if there is too much work remaining after a startup, it is most likely that the contractor will get stuck on the project. This is particularly true when the scope is not clearly defined, and a client generates more and more requests for modifications.

On the other hand, one of the possible benefits of this situation is that before a startup a client is much more flexible. The main objective at this phase is to finish the commissioning and startup, and not dive too deeply into the details of every specific issue. Therefore, it is a good opportunity to close as many issues as possible with as little effort as possible.

Generally speaking, it is better to avoid such situations, but if one has already occurred, then it is better to be ready and use its advantages.

Success journey

Automation projects have many more particularities than the ones mentioned here. Obviously, it is quite difficult for project managers to remember all of the points, but being aware of at least some of them could help them avoid disastrous pitfalls and mistakes. A wise, precise, and conscious approach to managing automation projects—with a clear understanding of specific features—makes the execution of the project smooth and predictable.

About the Author

Dzhamshid Safin, PhD, PMP, is a senior control and automation engineer at Tecnimont. He has more than nine years of engineering, commissioning, and project management experience in the petrochemical, oil and gas, energy, utilities, and building automation industries.

Safin holds a PhD in engineering and PMP certification from the Project Management Inst

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www.isa.org/certify • info@isa.org
Recommended ISA book:

Adapted from News and Press Releases, 9 May 2018.

The International Society of Automation (ISA) announced the third edition release of “A Guide to the Automation Body of Knowledge”, a comprehensive, yet practical overview of the essential concepts and processes in industrial automation and the skills required to master them.

This new release has been updated to reflect the continuing evolution of digital technologies and their impact on automation processes as well as new automation standards in such areas as alarm management, HMI design, and operational technology cybersecurity.

The book’s co-editors-Nicholas P. Sands, PE, CAP®, Senior Manufacturing Technology Fellow at DuPont and Ian Verhappen, P.Eng., CAP®, Senior Project Manager at CIMA+-are ISA Fellows who bring decades of collective expertise and experience in automation standards development, automation competency, safety instrumented systems, alarm management, process safety, and industrial communications networks.

“Though much of the content of this guide covers the fundamentals of the automation profession, automation is a dynamic field of practice that continues to change through new technologies and practices. That’s why it was important to introduce this new edition,” says Verhappen. "The value of the book remains the same, however, as it serves as a highly applicable, condensed reference guide to established automation principles and practices."

Given its easy-to-follow, plainly written format and approach, Sands says the book is particularly valuable to automation professionals early in their careers as well as to other practitioners in the field needing a “refresher” on certain topics.

The guide is also consistent with the Automation Competency Model which defines the core skills and knowledge needed to succeed as an automation professional-and relied upon as a study guide for those seeking to gain ISA Certified Automation Professional® (CAP®) certification.
CAP QUESTIONS

Are you ready for taking the CAP Certification?

Let’s review these questions:

1. “Slip” in an AC induction motor is defined as:
A. synchronous speed minus no load speed
B. difference between speed of stator field and rotor speed
C. rated speed plus synchronous speed
D. speed at which motor develops torque

CAP Answer
The correct answer is B, "difference between speed of stator field and rotor speed." Slip is usually expressed as a percentage, and varies by motor, from nominally 0.5 percent for very large motors to about 5 percent for small, specialized motors. If \( n_s \) is the stator electrical speed and \( n_r \) is the rotor’s mechanical speed, the slip, \( S \), is defined by:

\[
S = \frac{(n_s - n_r)}{n_s}
\]

Motor rotation is developed in an AC induction motor through the effects of a moving magnetic field. As the speed of the rotor drops below the stator speed, or synchronous speed, the rotation rate of the magnetic field in the rotor increases, inducing more current in the rotor’s windings and creating more torque.

Slip is required to produce torque. Under load, the rotor speed drops, and the slip increases enough to create sufficient additional torque to turn the load. A very efficient way to control slip is to use a variable frequency drive.


2. How are the maintainability and maintenance of automation systems related?
A. Maintainability is a front-end, design outcome; maintenance is related to ongoing system availability.
B. Maintainability is related to system availability; maintenance is related to traceability and warranties.
C. Maintainability is a front-end engineering function; maintenance is an ongoing engineering function.
D. Maintainability is related to malfunctions; maintenance is related to service quality.

CAP Answer
The correct answer is A, "Maintainability is a front-end, design outcome; maintenance is related to ongoing system availability."

Maintainability is the probability that a device will be restored to an operating condition within a specified period when maintenance is done with prescribed resources and procedures. It can also refer to the inherent characteristic of a design or installation that determines the ease, economy, safety, and accuracy with which maintenance actions can be performed on it.

As such, maintainability should be addressed during the front-end engineering and design phase of a project, so these characteristics are built in to the process. This includes addressing items like accessibility for removing pumps, piping, and instruments; complete documentation and procedures; availability of spare parts; personnel training and qualification; and suitability for purpose.

Maintenance is what is performed on a system to ensure that it remains in good working condition, but also, if a failure should occur, maintenance is the mechanism used to return the system to the previous working condition.

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About ISA Construction & Design Division

The Construction and Design Division (CONDES) serves practitioners in all areas of automation, bringing together professionals involved in design, construction, and commissioning activities related to all types of facilities. CONDES supports development of applicable standards, recommended practices, and technical papers. Within the construction and design arenas, Division Members are involved in all facets of facility design and construction, building automation, safety and security, construction management, and commissioning of facilities and process systems.

After being dormant for several years, we are pleased to announce that our Construction and Design Technical Division is now active again! We have a new group of enthusiastic volunteer leaders, and great plans for 2019.