



State of the Industry

Observations, trends and information for the construction industry

May 2018

Volume 6 Issue 1

Please let us know what you think by sending us a quick email. Read past State of The Industry Reports , [Click HERE.](#)

Another perspective on the “Winds of Change”:

What is the ROI for Capital Investments to Externalizing Work®?:

There is an evolutionary cycle of innovation and disruption: technology advances, innovation occurs, processes adapt, perceptions shift. Innovation is not limited; it is truly boundless. A new tool or material can only improve the outcome or system performance to the extent that the system allows. Innovation creates a new path, leads to new processes and ultimately drives the Winds of Change. (NRC, 2009, Page 20)

It is being forecast that the global construction industry will be investing increasing amounts of money, training, and resources on technology, hardware and software; as well as the training to utilize it. What Computer Aided Drafting (CAD) and Computer Numerically Controlled (CNC) systems have done for manufacturing, Building Information Modeling (BIM), CNC and robotics are now doing for construction (Step 4 in Industrialization of Construction®, Modeling and Simulation. Book One: The Here and Now – How to Be Competitive. 2015 MCA Inc., Daneshgari, Moore)

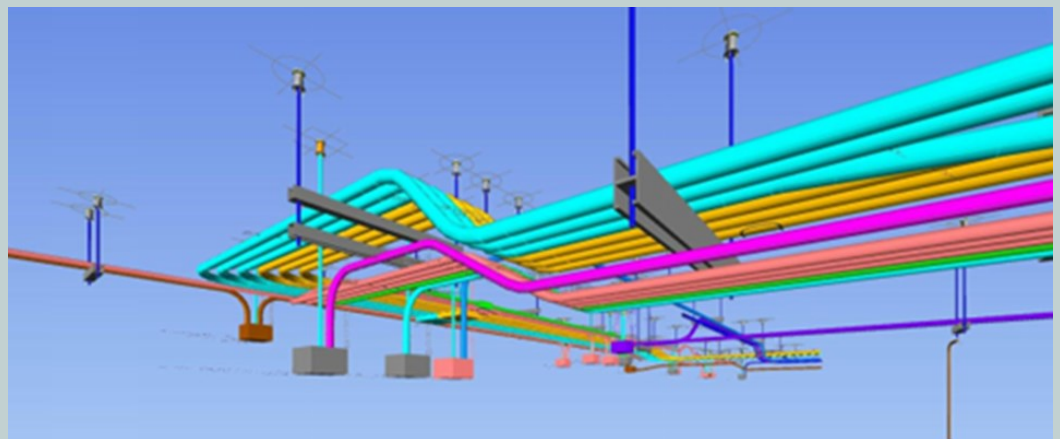


Figure 1

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2018 Calendar

- June 13th & 14th, 2018 – Agile Construction® Class 101 – Chicago, Illinois
- May 22nd, 2018 Agile Construction® 101 Boston, NECA
- June 15th, 2018—CEO Forum —Chicago, Illinois
- July 13th & 14th, 2018—Industrialization Of Construction® - Northern Illinois NECA
- July 16th & 17th, 2018—Agile Distribution® - Madison, WI
- August 22nd & 23rd, 2018 –Agile Construction® 101—New Jersey
- November 1st & 2nd, 2018 – Agile Construction® 101 – IEC Chesapeake, Laurel, Maryland

For more information or to register

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What is the ROI for Capital Investments to Externalizing Work®? Cont.:

For more than a decade now, contractors have been implementing prefabrication facilities in their shops and fabrication sites on larger jobs. The trends now are shifting. Having BIM models (Fig 1) available to give more insight into the layout and installation of the components, specifically the conduit runs, far in advance of shipping material to the job site has opened new doors for proactive and progressive contractors aiming to reduce cost, risk and significantly improve the capacity of their business beyond the constraints of labor availability. With BIM layout and installation drawings available earlier new tools are beginning to emerge that have been designed to take advantage of this earlier and more complete information. Specifically, with conduit, we are seeing a slow but steady rise in both interest and follow through to acquire and install large scale automated conduit bending, cutting and threading equipment to support Externalized Work® from the job site.

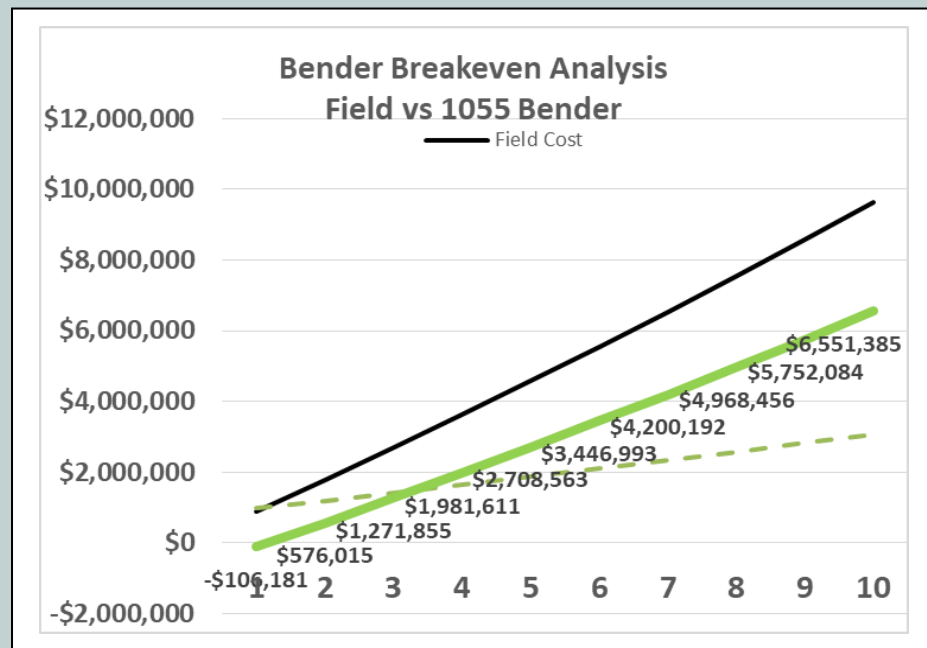


Figure 2

Through the use of BIM, positioning systems, and automatic or semi-automatic conduit bending equipment, we now see these converging technologies are supporting the Industrialization of Construction® in conduit manipulation. This innovation will encourage processes to adapt and achieve significant savings in at least the following areas:

- Reduced material waste
- Improved labor effectiveness



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What is the ROI for Capital Investments to Externalizing Work®? Cont.:

- Reduced material handling costs
- Improved accuracy
- Better design and planning
- Fewer pieces of equipment to manage and maintain
- Reduced labor costs
- Improved safety
- Better labor balancing

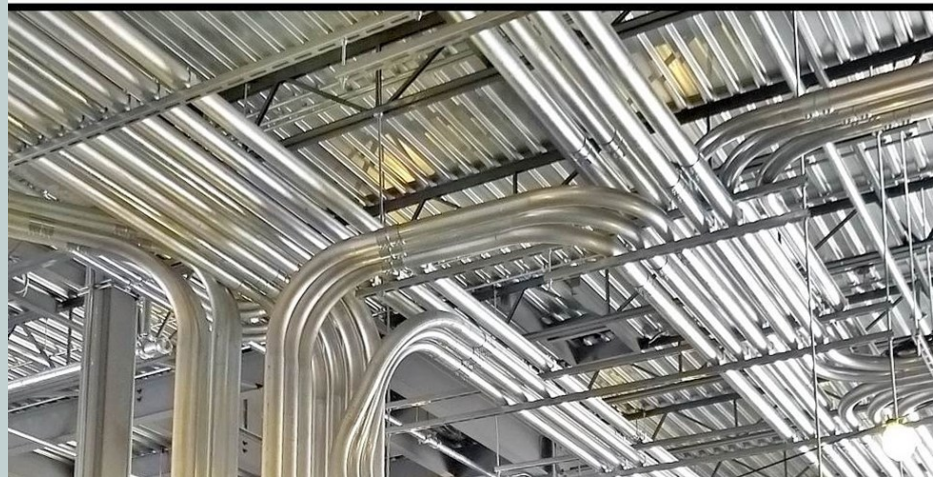


Figure 3

Despite the seemingly insurmountable cost of full scale, high end conduit benders, cutters and threaders we are seeing increasingly consistent results that indicate a mid- to large-sized Electrical contractor can see ROI in less than two years, and savings in the millions each year thereafter (Fig 2).

For a contractor that is purchasing 120,000 sticks of conduit for job site installation the investment of over ¾ million dollars can be offset by externalizing the roughly 54,000 bends. There should be a potential labor savings as well as the efficiency improvement. Greenlee's 1055 bender for example, is capable of bending conduit in as little as 1/3 the time of a manual bend, utilizing a single operator earning 70% of the hourly rate of a qualified journeymen. Altogether this brings the ROI to less than 2 years for a contractor doing roughly \$100 million annually, or a distributor that wants to set up shop in a market that supports this same level of conduit installation.

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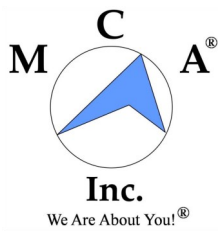
- Transformation
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Articles Volume II
Dr. Perry Daneshgari
Dr. Heather Moore
& Contributors

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What is the ROI for Capital Investments to Externalizing Work®? Cont.:

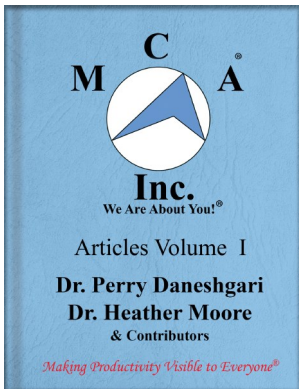
What's Around the Bend is Beyond the Bend

The question will be: How well will your internal processes adapt to support innovation? Can you effectively implement processes and procedures that enable results on this level? Whether you are a small and growing electrical contractor, a multi-national giant or just a visionary support services provider to the industry this modern technology and these new tools warrant a very thorough investigation.

MCA has been working closely with manufacturers, distributors and contractors to ensure that the acquisition and implementation of larger prefabrication equipment is properly planned and worked into the business model. Only in this way can the investment be justified, with very short ROI.

We have investigated replacing the labor used to bend pipe with an automated machine that can make the same bend, faster and more consistently. But, this is only the beginning. After the bend is complete is when the installation begins, and the installation labor is far more impactful to job profitability than the fabrication labor. In the simplest sense it may take only a matter of minutes for an Electrician to make the bend, but it could take as much as 15 or 20 minutes (or more) to install that same piece of conduit, and hours handling it to get it to the point of installation. These large-scale benders are only effective if your business has both the facility and the operating processes to effectively plan, manage, handle and install prefabricated conduit runs at the jobsite.

The BIM Bender and its effective implementation are an extension of an Agile Construction® business model. Utilizing the Bender and realizing the true potential savings of this technology begins with understanding the work, the WBS®. Knowing that conduit runs will be designed, fabricated and handled external to the jobsite, away from the point of installation, it is necessary not only to complete the drawings, and bend the pipe, but also to efficiently schedule the production, logistics and installation of not only components, but complete sub-systems. Given a good WBS, large scale BIM benders are set to do as much in the advancement of Agile Construction® through expansion of Externalized Work®, as JPAC® and SIS® have

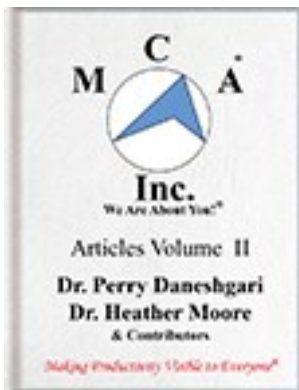


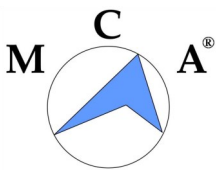
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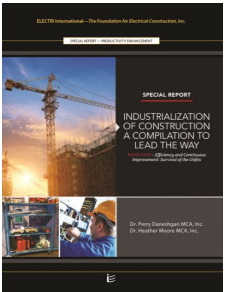
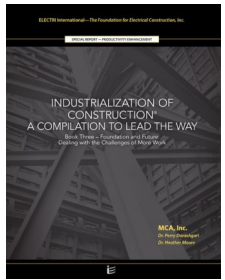
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ELECTRI International has released all four books in a series of four books on Industrialization of Construction.

All four books are written by Dr. Perry Daneshgari and Dr. Heather Moore, of MCA for ELECTRI International

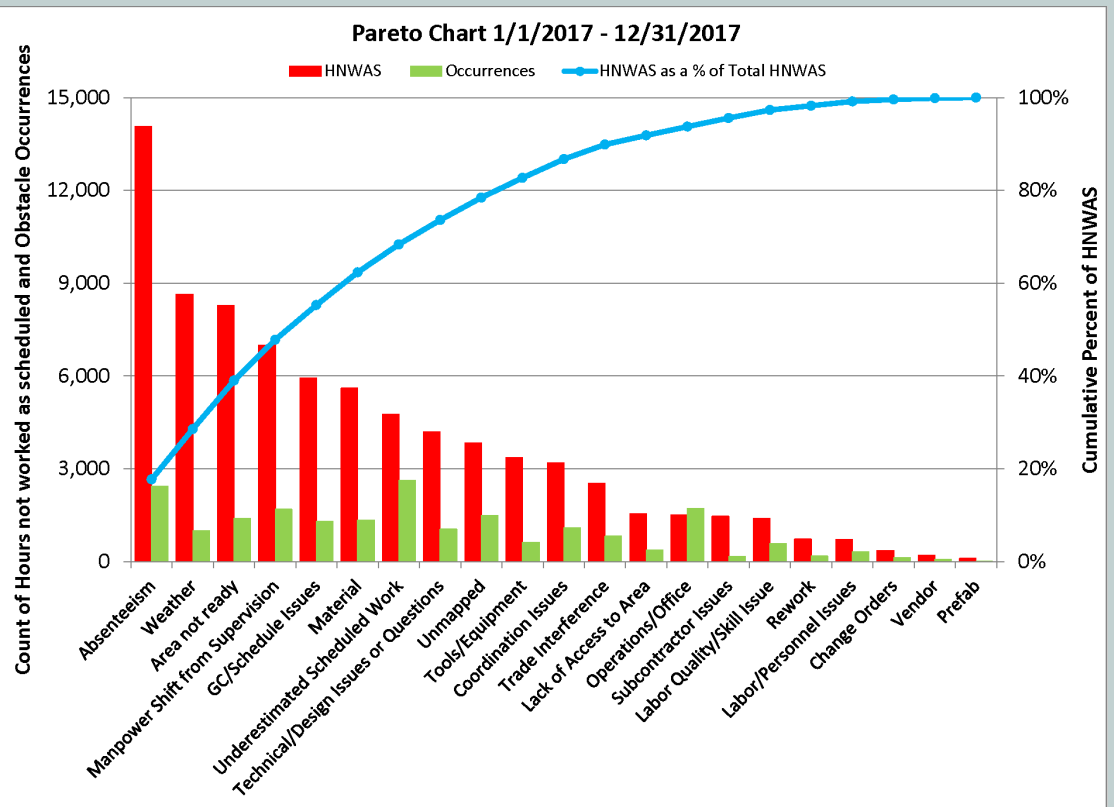
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What is the ROI for Capital Investments to Externalizing Work®? Cont.:

done for reducing or even eliminating installation productivity loses through early detection and increased time for correction.

Large scale BIM bending can produce remarkable savings, and despite the seemingly large price tag, a very short ROI. However, fully leveraging the maximum potential of the investment means first recognizing the principles behind mass production, high speed production and coordinated supply chain management. All of these are outside the core competence of most traditional electrical contractors but are fast becoming a key business foundation for electrical contractors familiar with and properly implementing Agile Construction® principles.

SIS® Industry Wide Results :



In 2017, over 1 million hours of work passed through the Short Interval Scheduling (SIS®) process and tool. In this SOTI, MCA introduces an industry – wide view of obstacles from its user base. Over 79,000 cumulative Hours Not Worked as Scheduled (HNWAS) and over 20,000 cumulative Occurrences for the industry



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SIS® Overview

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SIS® Industry Wide Results, Cont.:

were gathered from MCA's clients using SIS®. The HNWS as a percentage of scheduled hours is 7.5%, which aligns with the 7-10% range that we train for as a "normal range" of HNWS. The Pareto chart above shows the aggregate results of the obstacles. **If you are interested in seeing how your company compares to this national average, please contact us.**

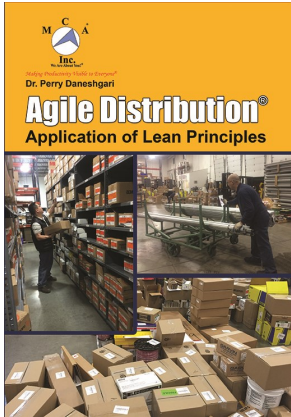
The top 9 obstacles represent 80% of the total HNWS across the industry. The largest obstacle of the industry is Absenteeism with 14,069 HNWS and 2,440 Occurrences, accounting for 17% of HNWS as a total % of Total Hours. The second largest obstacle is Weather with 8,284 HNWS and 1,003 Occurrences, accounts for 28% of HNWS as a total % of Total Hours. Underestimated scheduled work continues to be the number one occurring obstacle. As Agile practitioners have learned in their training, this obstacle often does not result in HNWS since it typically means the supervision is overzealous in their daily scheduled work expectations vs. what their crew can do. With this information on the industry, MCA tools, JPAC® and SIS® can move predictability up sooner in projects and create further prevention from these main obstacles.

The Power of Peer Groups:

Every business starts with people doing things that they know how to do best. If what they do ends up being what the customer wants and is willing to pay for, then the business starts growing. In the Electrical Contracting business many contractors are able to do this by simply being good electricians, and it is very typical for the contractor to grow to be \$ 2 to 5 million in a matter of a few years. So, when the contractors do a good job or when the economy heats up, the contractors by the nature of demand and supply of the markets grow beyond the individually controllable buddy system of small contracting. The owners then go to some seminars and attend IEC or NECA annual conventions, which exposes them to learn how to run their companies. They come back home with a few forms and processes or new software and tools, which they ask their people to use. At this stage, these processes that the forms and software should be supporting are not yet formalized in the contractor's business, and they don't turn into actual procedures. (To read full article [click here](#) (Published in its in EC&M magazine 2017)).



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by
Dr. Perry
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CEO Forum:

Friday: June 15, 2018

Time: 10:00am - 4:00pm (CT)

Location: DoubleTree by Hilton O'Hare—
5460 North River Road
Rosemont, IL 60018



**Enabling CEO's to Function
and Disrupt the Status Quo**

The **CEO Forum** will be guided by the Steering Committee's vision and work to identify where the construction and infrastructure industry is going and what is needed to bring about its future. Topics for this Forum Event will include:

- Disruption coming through Industrialization of Construction®
- Disruptive approaches being taken by offshore companies and countries
- Technology advancements, such as UAV's and IoT
- Alternative procurement and delivery chain methods for externalizing work®, such as Megacenters

We look forward to selecting a group of individuals who will help put a dent in the industry, and the overall shelter and infrastructure that humans depend on, through leading edge research and application that results in profitable and sustainable business models. This exclusive forum is by **invitation only** and is limited to 25-30 guests. If your company is interested in participating in the CEO Forum, please send your requested delegate(s) to avanwagner@mca.net, and the Steering Committee will review your request for participation.

NEW! Agile Tools User's Forum:

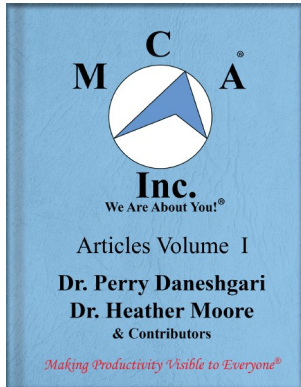
MCA is currently in the process of developing an Agile Tools Forum, which will function as a portal, designed to help Agile Practitioners conveniently help other Practitioners in open communication amongst each other. The users will be encouraged to solve their own issues through discussion with their peers. With that said, this web based forum will also be moderated by MCA Staff to help field and expedite any questions the users may be struggling with. Look for a pilot to be launched with Staff Electric in May, 2018.



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SBPI® Phase I – Maintenance of Processes:

How many times have you asked yourself "why isn't everyone following the same process?" Or, "why doesn't everyone just do what they are supposed to do?" The reason is "entropy." There isn't anything that humans have made that will last without some kind of maintenance. Processes need the same attention to maintenance as any object or they too will fail. Now, how do we know what to focus on, and what part of the process needs our attention?

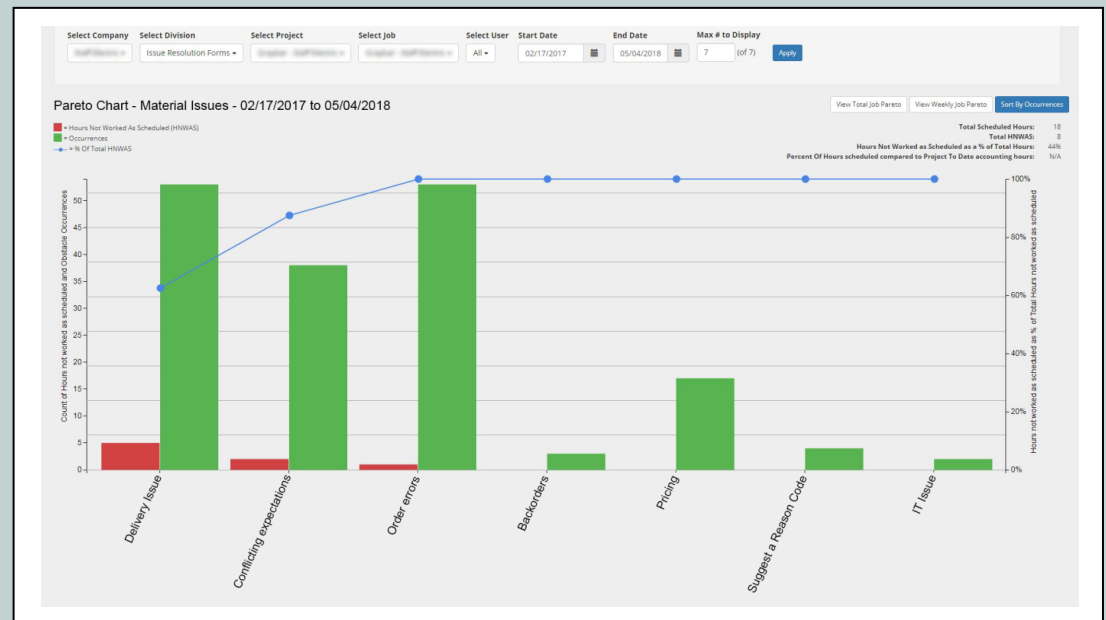
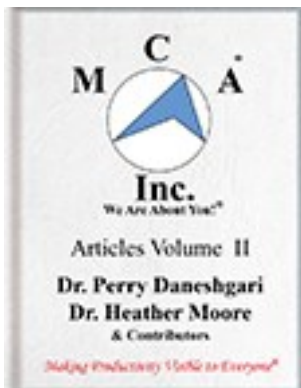


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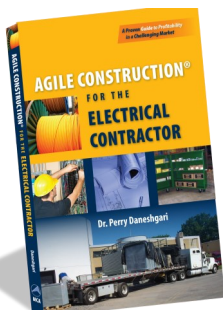


In the latest MCA State of the Industry Report (Vol V Issue 3 2017), the article 'The Process Failure Blues' covered "why" processes fail and why we need to take care of them if we want them to work and be efficient. In this article we help identify which processes need attention and how to identify what to focus on.

All processes need to be maintained in order to stay effective. If you wait too long the processes may not be as efficient as when it was originally designed. Things change, and you want to make sure the processes change along with it. If you don't have an indicator of when to actually revisit the processes, or when an enforcement of the usage is necessary, you may run into the danger of the processes evolving on its own, and drift away from the original intent. Getting everyone back on track again may be time consuming and very costly. It is necessary to have a structured approach on identifying which processes need revisions, which need adjustments, and at what time to implement these changes. Short Interval Scheduling (SIS®) and Issue Resolution (IRF) are used to capture the deviations from each process. (This is explained in more detail in [Book 4 of Industrialization of Construction®: Continuous Improvement: Survival of the Unfits.](#))



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SBPI® Phase I – Maintenance of Processes, Cont.:

Both SIS® and IRF help identify the common causes that make a process fail or to be not as efficient. The example provided in **Figure I** shows that the main issues noted are “Material issues”. By using the Pareto Chart principles it is easy to identify which category the issues are most occurring and the frequency. It is important that every user of a process use at least one of the two tools above to identify if a process is not working. Based on this categorization we can now do a deeper dive into the “Material Issues” and start identifying the cause.

A few examples of this could be:

- Distributor deliveries are consistently late
- The material does not get delivered the way the foreman would like it to arrive
- The Field orders the material in multiple ways

In all three cases we need to ask ourselves ‘why?’ to help understand what the main causes are:

- Why are the deliveries consistently late?
 - Are the deliveries late when using a particular Distributor or driver?
 - Is a different driver delivering each time, and is unfamiliar to the area?
 - Is the time of day interfering with the delivery schedule?
- Why does the material get delivered to the wrong location on the jobsite?
 - No or limited access to the desired location?
 - Are other trades preventing delivery to the desired location?
 - Does the time of the delivery have anything to do with where the material gets delivered?
 - Are the elevators available at the time of delivery?
 - Does your distributor have any restrictions to the area?
 - Does the order get handed off to too many stops before being filled, leaving plenty of room for error?
- Why are there so many ways of ordering material?
 - Phone, Fax, Purchase Order, Email, Scrap piece of paper or cardboard
 - Are you ordering material off of drawing?
 - Are the drawings clear and accurate?
 - Communication?
 - Word of mouth?
 - Is there a language barrier?



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SBPI® Phase I – Maintenance of Processes, Cont.

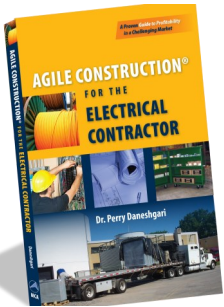
- Does the order get misconstrued during handoffs?

The key part of process maintenance is to not jump to any conclusions before the “why” is identified.

The possible reasons why a process fails needs to be identified based on the feedback from all parties affected by the process. Issue Resolution Forms help identify where the issue shows up. It is very critical to identify where it comes from by using more detailed description of the IRF or detailed Reason Codes by capturing it within SIS®.

Testimonials:

- **Sargent Electric** "By far, there is more take-home value compressed into one of Perry Daneshgari's sessions than a full-semester in most college-level construction management courses! While others continue to look in the rear-view mirror rehash-ing same-old "best practices," Perry insightfully points us ahead to where the industry is going--and provides us with a full set of practical solutions on how to get there." ~ Frederic B. Sargent, Former CEO of Sargent Electric
- **Cupertino Electric** "This is a great publication that I would like to review with our PM's and superintendents. It speaks to much of what I have been pushing over the past couple years but in more eloquent detail." (in reference to Book Two -- Operational Model Needed to Compete in Industrialized Construction, written by MCA for Electri International) ~ Rob Thom, Vice President of Operations, Cupertino Electric, Inc.
- **Staff Electric** "Before SIS® and JPAC® we would have seen these disruptions just as part of construction, now we're looking at the work differently and can see the impacts." ~ John Soehnlein, Technologies Forman at Staff Electric, Inc.,
- **Staff Electric** "I found the 201 level Agile Construction® class this week incredibly helpful, if you haven't taken it yourself yet, please get into this one." ~ Mark Chappel, Project Manager at Staff Electric, Inc.



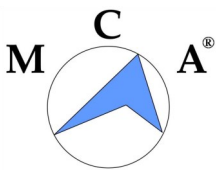
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- Robots: Are they for Real—Disruption and Impact of Technology on Job PerformanceEC&M Magazine 2018
- Recruiting for the Future.....Insight Magazine 2018
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- Winds of Change: Industrialization of Construction.....Insight Magazine 2018
- Ground Breaking Technology: Another perspective on the “Winds of Change”: Automation of Conduit BendingInsight Magazine 2018
- The Power of Peer Groups.....EC&M Magazine 2017
- Contracting is a Great Small Business.....Insight Magazine 2017
- Work Breakdown Structure From The Field.....Insight Magazine 2017
- Robots: The Next Wave!.....Insight Magazine 2017
- Winds of Change and the Event Horizon.....Insight Magazine 2017
- Green is Good, Green with Prefab is Better.....Insight Magazine 2017
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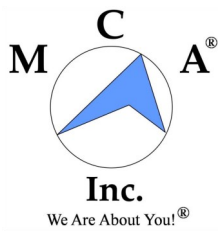
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Calendar of Events:

Web Based Training:

MCA is proud to announce that we have web based training available to all our clients. This offers participants the benefit of reduced training costs, greater flexibility in training schedules, and a greater variety of courses to choose from:

- JPAC® & SIS® mini classes

Tuesday's- SIS® Mini-Classes @ 10 & 10:15am EST

Wednesday's- SIS® Mini-Classes @ 9 & 11am EST

Thursday's- JPAC® Mini-Classes @ 3pm EST

Register here... <http://www.mca.net/Complimentary-Mini-Class-Registration-Page>

- Web based Agile Classes: *Call MCA for Details*
- Web Based Design Teams: *Call MCA for Details*
- Web Based Project Management courses: *Call MCA for Details*

Upcoming MCA, Inc. events and engagement can always be found on our website. www.mca.net or www.mca-soft.com

MCA's Agile Construction® Workshops — Across the Country:

Agile Construction® is coming to a town near you! MCA is conducting Agile Construction® classes at various locations across the United States and Canada. This is a great opportunity to see first-hand on what Agile Construction® can do for you and your company. See side panels for dates and locations. For more information and/or to register [click here](#), or contact Dan Waltz at dwaltz@mca.net

For up-to-date class information or to register visit <https://mca-soft.com/>.

Agile Construction®

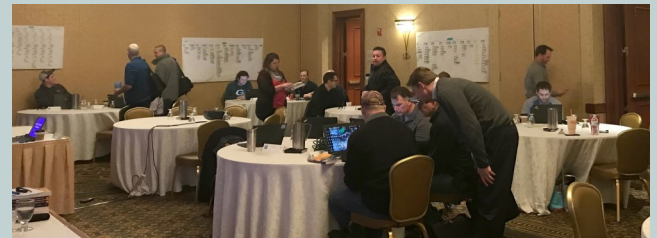
201 & 301 Level Classes:

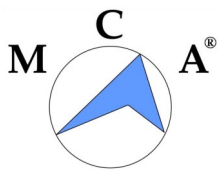
This workshop is for experienced practitioners, who have taken and

successfully completed MCA's Agile 101 classes. In this session participants will expand their understanding of Agile Construction® and develop higher level applications of the successful skills that you should already be applying.

The 201 training will expand on applications and results using your projects, we will dig deeper into proper planning of your work and configuration of the measurements to benefit from each component of Agile Construction® 101.

Look for Agile 301 level classes starting in 2019.

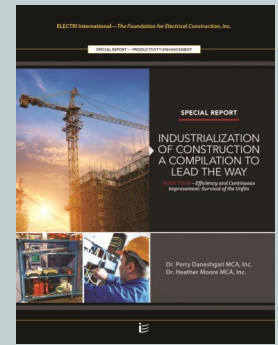
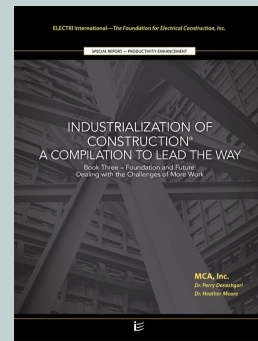
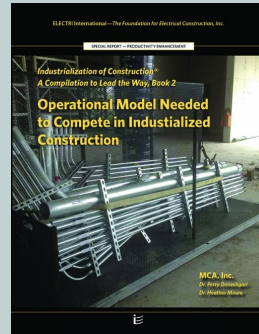
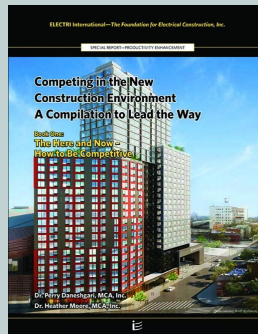




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MCA Books:



Industrialization of Construction® Books

Book #1: Competing in the New Construction Environment: A Compilation to Lead the Way — [Click here.](#)

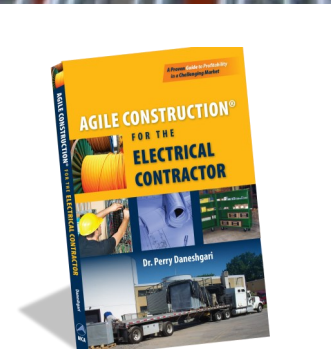
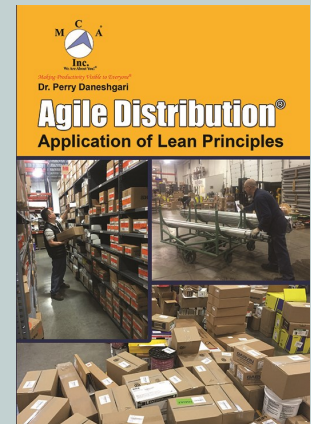
Book #2: Industrialization of Construction: A Compilation to Lead the Way — [Click here](#)

Book #3: Foundation and Future: Dealing with the Challenges of More Work — [Click here](#)

Book 4: Efficiency and Continuous Improvement: Survival of the Unfits, published by ELECTRI International — [Click here](#)

Agile Distribution® Application of Lean Principles -

Becoming lean in wholesale distribution is more important than ever in today's challenging economic market. Applying lean concepts makes sense because becoming lean means becoming a more effective distributor. And becoming lean will lead to higher profitability. This book discusses the steps distributors must take to design and manage a lean culture. It deals with one lucrative area: Operations, which includes all aspects of the order processing system—from the time you seek an order, to order entry, and all the way through to delivery of products and services. Apply the tools and techniques in this book to your company so that it will operate with minimal waste and few errors, while at the same time meet your primary goal of adding value to the products and services you provide. [Click here.](#)



Agile Construction® For The Electrical Contractor

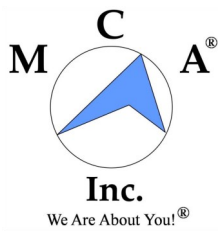
by
Dr. Perry
Daneshgari

\$55.95

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MCA Articles Vol I & II Ebook - Agile Construction® related articles on Transformation, Productivity, Profitability, Process, Procedures and Tools, and Measurements. Look for Vol III this June. [Click here.](#)



Making Productivity Visible to Everyone®

Agile Construction® Classes are Coming to a Town Near You!

2018 Calendar

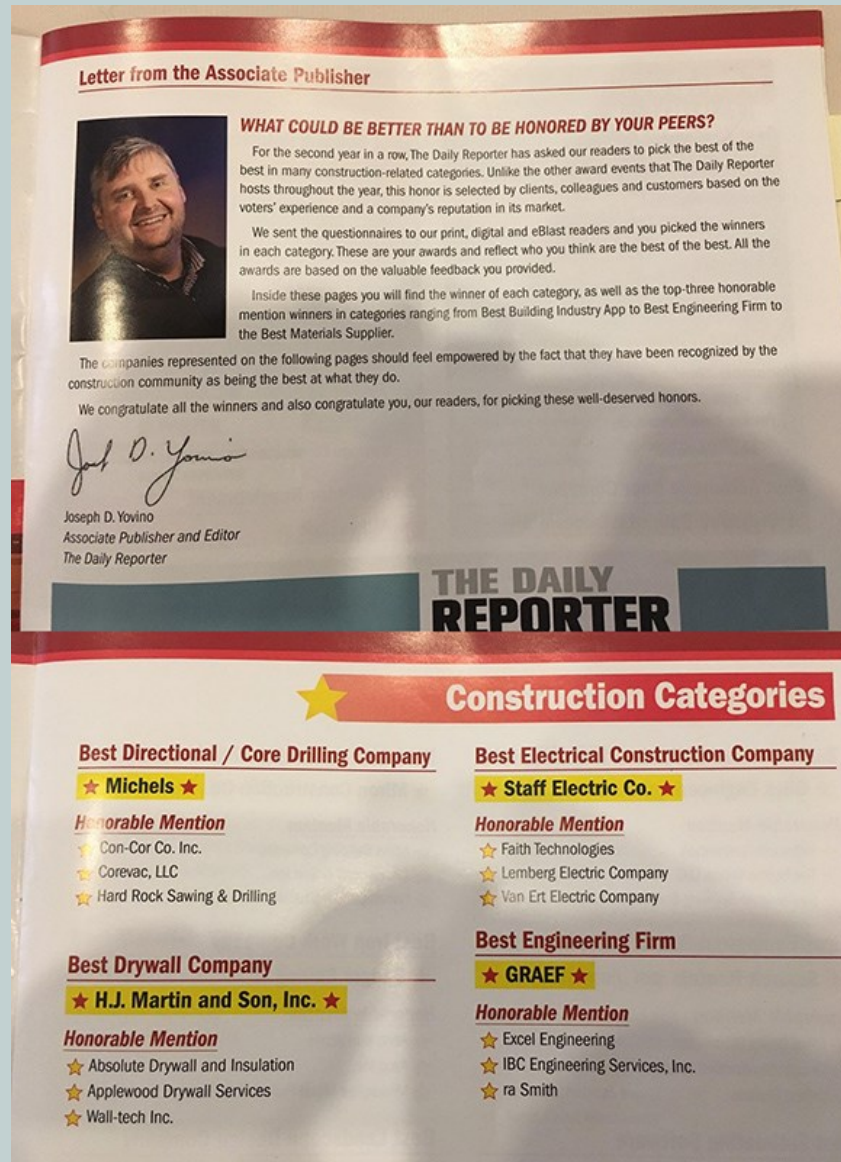
- June 13th & 14th, 2018 – Agile Construction® Class 101 – Chicago, Illinois
- May 22nd, 2018 Agile Construction® 101 Boston, NECA
- June 15th, 2018—CEO Forum —Chicago, Illinois
- July 13th & 14th, 2018—Industrialization Of Construction® - Northern Illinois NECA
- July 16th & 17th, 2018—Agile Distribution® - Madison, WI
- August 22nd & 23rd, 2018 –Agile Construction® 101—New Jersey
- November 1st & 2nd, 2018 – Agile Construction® 101 – IEC Chesapeake, Laurel, Maryland

For more information or to register

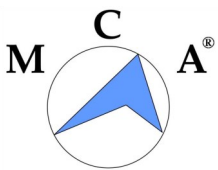
[click here](#)

Customers on The Move:

Staff Electric — has progressed through to the 200 level of Agile Construction® within the last year, and has the 300 level within their sight. Congratulations to Staff Electric for being featured in the Wisconsin, Daily Reporter this month as Best Electrical Construction Company.

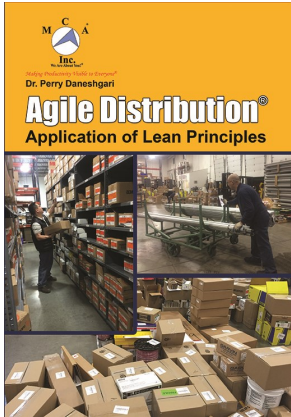


The Daily Reporter recognizes dozens of the top movers and shakers in Wisconsin's construction & commercial real estate market each year. Our Top Projects awards last spring saw more than 700 people come to honor what our panel chose as the very best projects from the previous year—along with everyone that helped make them happen. And in the fall, our Newsmakers event brings to the forefront the men and women who lead the way in the industry through innovation, success and perseverance. **To read more [click here](#).**



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Agile Distribution® Application of Lean Principles

by
Dr. Perry
Daneshgari

\$55.95

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Customers on The Move, Cont.:

Faith Technologies & Graybar — They are exploring new ways to elevate Externalized Work at their main US prefabrication facilities. Faith is poised to be the first Electrical Contractor in the country to utilize vendor services and advanced applications of Agile tools and principles. This initiative will allow Faith to introduce the next generation of Agile Construction® to the US market.

Werner Electric Supply — Werner is continuing to develop their centralized prefabrication and assembly facility. During the most recent quarter they have invested heavily adding tools and improving the plant layout to increase the capacity of their facility. From one location Werner can now efficiently offer prefabricated assemblies and many other unique services to their customers at very competitive costs and due to colocation with their extensive logistics hub, with minimal added lead time for delivery to the job site. A breakthrough in the Midwest for application of Externalizing Work®.

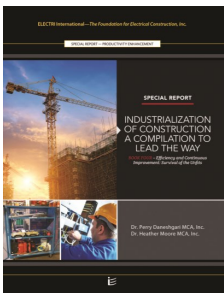
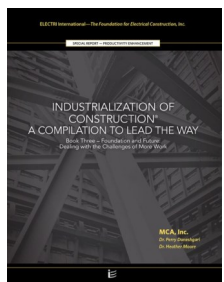
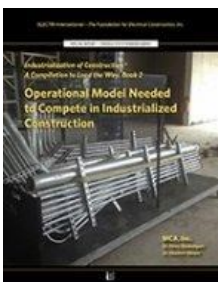
Mayer Electric — Mayer Electric is continuing to explore opportunities to increase the services offered to customers throughout the Eastern US. Currently Mayer is focused on mastering the consistency of services and pricing of these to be competitive in all markets they serve. MCA has been engaged through the assessment process to identify the key focus areas to align Mayer, so they can provide the most beneficial and cost effective services to their broad customer base.

Aldridge — To increase the focus on the planning phase and job set up. Aldridge Electric has started to introduce 'project startup clinics'. Where the project teams get trained and coached on an actual project how to get in even more detail on the planning and increasing your prefab opportunities.

Eckardt Electric – Eckardt Electric – is going into their 2nd year of implementing JPAC® on their projects with minimal training from MCA. They are currently have 26 projects in JPAC® and adding more each month.



Making Productivity Visible to Everyone®



ELECTRI International has released all four books in a series of four books on Industrialization of Construction.

All four books are written by Dr. Perry Daneshgari and Dr. Heather Moore, of MCA for ELECTRI International

For more info [Click here.](#)

Customers on The Move, Cont.:

Hardt Electric— Getting into the next levels of Project Management by using the Agile Tools continuously and updating the progress and open items of every job in the note section and upload functions in JPAC®. This is used by the whole Project team: PM, FM and electrician and increases the visibility among the team

Holmes Electric — Holmes expanded the agile training this year to their project engineers to help support their project management. They have continued to apply the Work Environment Management (WEM®) System across several of their large projects as well.

Culliton — has been working independently with the Agile Tools since 2015. They have successfully incorporated the Agile Construction® process in their company and have ingrained it throughout their culture.

Sprig — Sprig has used PAC® and SIS® to assist in their efforts to minimize the impact of a very large and unexpectedly challenging project, In these efforts MCA is using JPAC® and SIS® to help Sprig identify the sources and magnitude of factors outside their control that have unreasonably impacted installation productivity, and ultimately to be fairly compensated for all work performed.

Bronco Electric — is working strongly and successfully on connecting the JPAC® and SIS® tracking and visibility of the jobs to the benefits it can bring to the WIP and overall accounting management.

LiveWire Electrical Systems Inc. — has continued to apply the principals of Agile in their company with minimal support from MCA. They currently have 5 active projects in JPAC® and multiple projects in SIS® to include service work

Taylor Electric — is continuing to learn the usage of the Agile Construction® tools through JPAC®, SIS®, and Work Breakdown Structure.