

CONSTRUCTION BUSINESS OWNER[®]

THE LEADING BUSINESS MAGAZINE FOR CONTRACTORS

THE ERA OF THE DIGITAL CONTRACTOR

Sachse Construction's tactical approach to modernizing operations with technology

ALSO INSIDE

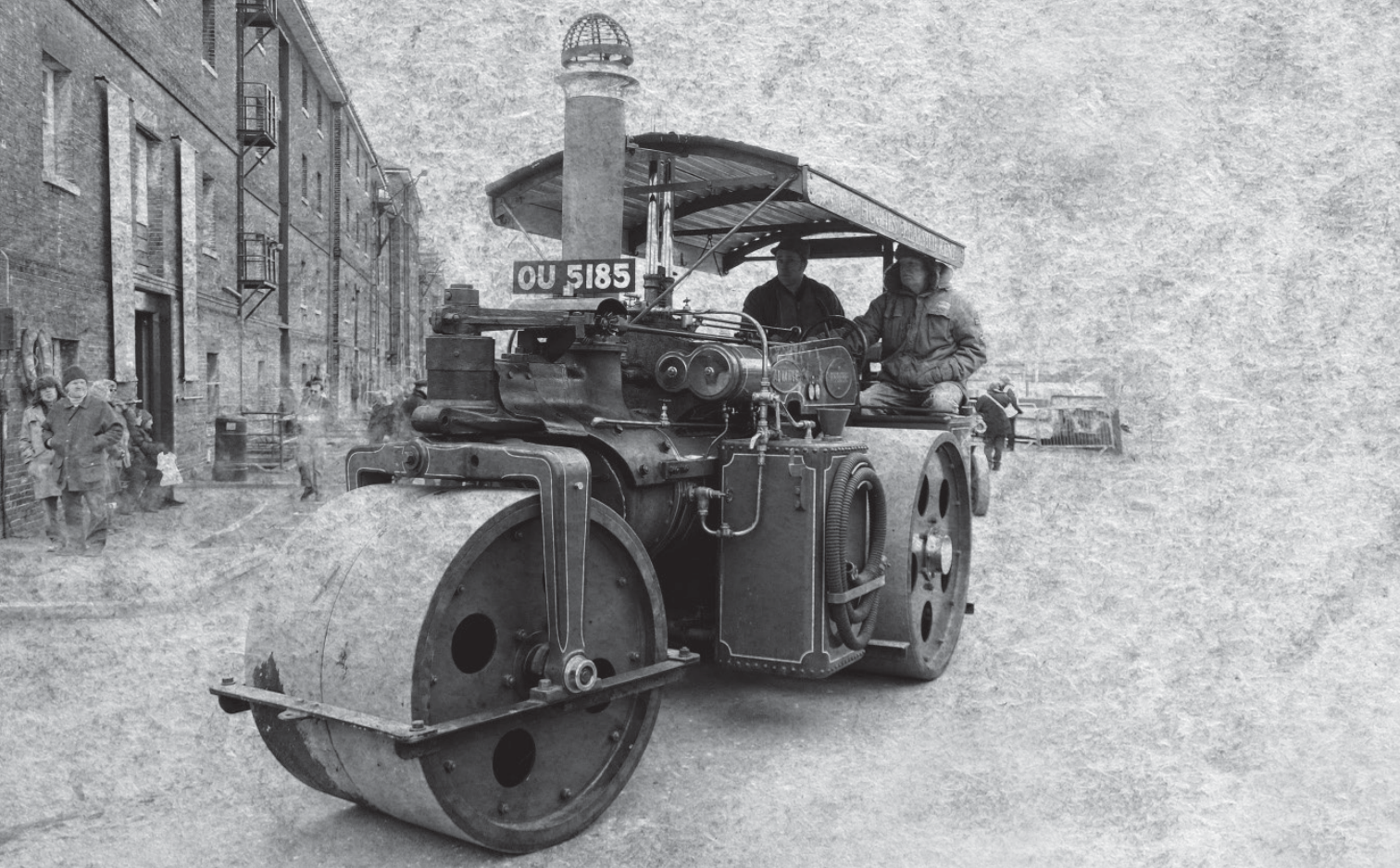
4 ways to turbocharge business development

IN THE OFFICE

Plans to help you pivot in a slower economy

IN THE FIELD

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FROM THE EDITOR | Kathy Wells

Last month, CBO attended the International Risk Management Institute's (IRMI) Construction Risk Conference (CRC) in Houston, Texas. The 38th annual event was held November 4-7 and hosted over 2,000 construction risk and insurance professionals, including project owners, general contractors, subcontractors, developers, insurers, and insurance agents and brokers. IRMI's CRC aims to educate and serve as a forum for the latest construction risk management and insurance topics, strategies and tactics. Turn to page 30 for post-conference coverage, including insurance trends and insights from leading insurance providers, the experts at IRMI and conference attendees.

On the cover this month, we feature Kathy Sulik and Andrea Wright, who came together for the goal of improving Sachse Construction's approach to technology. Sulik, a commercial project manager for Sachse Construction, said that as clients become more sophisticated, they are increasingly wanting to use contractors that leverage the newest technologies as well. Wright spent nearly 7 years with Sachse as the firm's director of empowerment, handling the company's training, processes and enterprise resource planning (ERP) software. She has helped guide Sachse through technology changes, including the implementation of a new construction management software platform. An ardent proponent of technology, Wright recently started her own company, CTP Solutions LLC, to help contractors, including Sachse Construction, modernize their operations and maximize team-member potential. Get the whole story on page 34 in "The Era of the Digital Contractor."

Our cover series continues on page 38 with a focus on software and technology. "The Cost of Not Keeping Up with Technology" shares advice for making difficult decisions while balancing the funding of equipment, people, physical expansion, different types of technology and more. These critical choices are rarely easy and can make or break a company if not handled properly.

Wrapping up our cover series, "Accelerating Adoption in 2019" covers three main areas of construction technology anticipated to launch the industry forward. According to the author, the coming year will see contractors focusing on the most effective ways to leverage data analytics across their organizations. Turn to page 42 to make sure your business is ready for a transformation.

Looking ahead to 2019, the entire CBO team will be headed to World of Concrete (WOC) next month. The annual show will take place Jan. 22-25 at the Las Vegas Convention Center in Las Vegas, Nevada. WOC was introduced to the commercial construction industry in Houston, Texas, in 1975 and hosts more than 1,500 exhibiting companies and 58,000 registered industry professionals in more than 745,000 net square feet of exhibit space. At the show, industry professionals can learn from experts, engage in hands-on training and demonstrations, and get a closer look at thousands of products and services. If you're interested in attending, registration is open at worldofconcrete.com/en/register. If you're headed to the show, visit the CBO team at Booth N1751 and follow us on Twitter @CBOMagazine to keep up with us during the show and beyond.

Take good care,

Kathy Wells



Managing Editor Elizabeth Manning recently attended Hilti's Innovation Day, where she and other media representatives in attendance had the chance to test the usability of Hilti's new DD30-W diamond core drilling system (pictured here). The drill increases accuracy and is exceptionally quiet, making it a great solution for jobs where loud hammer drilling is prohibited.

CONSTRUCTION BUSINESS OWNER

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► AEM Announces New Staff Members



Mike Lietke

The Association of Equipment Manufacturers (AEM) has announced two new staff members: Mike Lietke is now senior director of statistics, and Sara Feuling, P.E., is director of construction. Lietke joins AEM from Briggs & Stratton (dealer development and field training), after 12 years with Harley Davidson, serving in dealer district management and market and financial analyst positions. Feuling joins AEM with 10 years of experience with the Wisconsin Department of Transportation and holds a bachelor's degree in civil and structural engineering and a master's degree in civil engineering. She fills a position previously held by John Somers, who moved to a new AEM position as director of the utility sector. Visit aem.org.

► OSHA Launches Program to Target High Injury & Illness Rates

The United States Department of Labor's Occupational Safety and Health Administration (OSHA) is initiating the Site-Specific Targeting 2016 (SST-16) Program using injury and illness information electronically submitted by employers for the calendar year (CY) 2016. The program will target establishments with high injury rates in both the manufacturing and nonmanufacturing sectors for inspection. Under this program, the agency will perform inspections of employers the agency believes should have provided 300A data, but did not during 2016's injury and illness data collection. For CY 2016, OSHA required employers to electronically submit Form 300A data by December

15, 2017. The CY 2017 deadline was July 1; however, employers may still provide this information to the database. Going forward, establishments with 250 or more employees that are currently required to keep OSHA injury and illness records, and establishments with 20-249 employees that are classified in specific industries with historically high rates of occupational injuries and illnesses, will be required to provide this information each year by March 2. OSHA's On-site Consultation Program offers employers with up to 250 workers free, confidential safety and health advice on complying with OSHA standards and establishing and improving safety and health programs. Visit osha.gov.

► ABC Supply Co. Inc. Acquires Assets of CSC Home & Hardware

Building products distributor ABC Supply Co. Inc. has acquired the assets of CSC Home & Hardware, distributor

of drywall, roofing and hardware products. ABC will continue to serve customers from the former CSC Home & Hardware location in Morgantown, West Virginia. The acquisition adds a new market for ABC Supply, allowing the company to build relationships with the area's contractors and provide the products and support they need for their businesses. Current CSC Home & Hardware associates will continue to work at the branch, making sure customers receive consistent service. Visit abcsupply.com.

► Infrastructure Expert C. Yoga Chandran Joins HNTB as Project Director

C. Yoga Chandran, Ph.D., P.E., G.E., has joined construction engineering company HNTB Corporation as project director and vice president. Based in HNTB's Santa Ana, California, office, Chandran supports the firm's work on some of the most complex infrastructure projects throughout the region. Chandran has more than 30 years of experience in a broad range of technically challenging engineering projects, including project management, planning, design, project assessment and environmental documents, bid documents and seismic analysis. He has served in key roles on tunnel and geotechnical studies for both highway and transit tunnels. Chandran is a licensed professional engineer and a registered geotechnical engineer in California. He earned his master's degree and Ph.D. in geotechnical engineering from the University of California, Davis. Visit hntb.com.

She primarily interacts with corporate executives and their companies' respective human resource professionals, counseling them on human resources best practices, presenting practical training, drafting and reviewing human resource materials for compliance. White has more than 15 years of experience in HR. After becoming a licensed attorney, she founded her own firm, JW Employment Law Center, which provided human resources consulting and employment litigation services primarily to the small business community. After serving in the United States Army, White holds a bachelor's degree in business management with an emphasis in HR from the College of St. Scholastica in St. Paul, Minnesota, and a Juris Doctor degree from Hamline University School of Law in St. Paul, Minnesota. She holds a senior professional in human resources (SPHR) designation and maintains her license to practice law so that she can stay abreast

250,000

As JLG nears its 50th anniversary, the company, which produced the first boom lift, has announced a milestone in North American manufacturing—the production of its 250,000th self-propelled boom lift. Visit jlg.com.

► Cavnac & Associates Appoints Attorney Jessica White to HR Risk Advisor



Jessica White

Veteran human resources (HR) expert Jessica White, Esq., SPHR, has been appointed HR risk advisor at the risk management and insurance brokerage firm, Cavnac & Associates, based in San Diego, California. In her new role, White provides pragmatic advice to clients, helping them reduce the frequency and severity of their employee claims.

of new developments in the employment law arena. Visit cavingnac.com.

► PCL Construction Promotes First Female Executive to Vice President



Cathy Orquiola

PCL Construction Services Inc. has named Cathy Orquiola as vice president and district manager of its California Buildings division, where she will oversee all operations throughout California, including Los Angeles, San

Diego and Orange County. Orquiola first joined PCL in 1998 as assistant project manager in Orlando, Florida, and returned to PCL in 2015 as director of corporate development. Prior to returning to PCL, Orquiola rose through the ranks and became vice president, operations manager of an international construction firm, overseeing all southeastern projects from Savannah, Georgia, to Puerto Rico. In January 2017, Orquiola was promoted to district manager of California Buildings. She was recently recognized by the Los Angeles Business Journal as one of the 500 Most Influential People in Los Angeles. Orquiola graduated from the Florida Institute of Technology with a bachelor's degree in civil engineering. Visit pcl.com.

► **ACI Announces New Middle East Regional Director**

The American Concrete Institute (ACI) has announced Ahmad Mhanna as the institute's Middle East regional director. In this new staff position, Mhanna will focus on ACI's comprehensive plan to increase knowledge sharing throughout the Middle East. The great innovation occurring now in the region, combined with ACI's more than 100 years of consensus-based knowledge, is a partnership that will accelerate the advancement of the concrete industry globally. Mhanna will assist in establishing and nurturing regional strategic relationships with members, chapters, companies, governmental bodies, educational institutions, partners and other construction industry organizations. Mhanna will also build upon recent partnership agreements and increase ACI activity in the region. He will be based at the ACI Middle East regional office, to be located in the Dubai World Trade Center. An ACI member and civil engineer, Mhanna has wide-ranging experience

in concrete and construction materials testing, analysis and applications. He holds multiple ACI certifications and has served as an ACI certification examiner. Mhanna holds a bachelor's degree in civil engineering from the University of Jordan and a master's degree in emerging technologies for construction from the University of Naples Federico II. Visit concrete.org.

► **Elsperman to Serve as 2019 President of AGC of America**



Dirk Elspersman

Tarlton Executive Vice President and Chief Operating Officer Dirk Elspersman will be sworn in as president of Associated

General Contractors (AGC) of America in April 2019.

Elsperman has 30 years of experience and a history of service in local and national capacities for AGC. In addition to serving as chairman of the board for AGC of Missouri, he has been a contributing member on 10 committees for AGC of America. In his year as AGC of America president, Elspersman will promote workforce development and diversity in construction through speaking with AGC chapter leaders and members across the United States to glean important industry insights on issues and concerns facing general contractors today. Elspersman has worked in all aspects of Tarlton's operations, including carpentry, estimating, project engineering, project management and executive management. Elspersman is a leadership in energy and environmental design (LEED) Accredited Professional. He holds a bachelor's degree in applied economics and business management from Cornell University, and a master's degree in business administration from Washington University. Visit agc.com.

► **GPS Insight Announces Executive Promotions & New Chief Executive Officer**



Gary Fitzgerald

GPS Insight, provider of tailored fleet-management solutions for organizations with fleets of vehicles, trailers and other mobile assets, has

announced the promotion of Gary Fitzgerald to chief executive officer (CEO). Former CEO and Founder Rob Donat will remain with the company as chairman of the board. Wayne Holder, the company's controller, will move to the role of chief financial officer (CFO), and Jason Walker, vice president of sales, will become the chief revenue officer. Holder has served as the company's controller since 2013, joining from the Arizona Commerce Authority where he was CFO. In his new capacity, Holder will take a more active role in financial planning and analysis. Walker has been with GPS Insight since 2010 and leads the company's sales efforts. While maintaining sales leadership, Walker will take an expanded role in marketing and indirect sales. Visit gpsinsight.com.

► **Komatsu America Teams Up with Chicago Blackhawks for 2018-2019 Season**

Komatsu America Corp., global heavy-equipment manufacturer, has announced plans to partner with the Chicago Blackhawks for the 2018-2019 season. "Earlier in the year, Komatsu announced plans to move into the city of Chicago in 2020. As part of a broader goal to invest more in local communities where we live and do business, we thought this would be an impactful way to increase our brand awareness, while supporting a storied, hometown sports franchise," said Rich Smith, vice president, products and services, Komatsu America. The Komatsu logo

will appear prominently on the ice for all regular season home games. As the first agreement with any of Chicago's pro sports franchises, the presence will raise the company's local profile and expose the brand to a more mainstream, national and international television audience. Visit komatsuamerica.com.

► **Coretex & Marcotte Systems Strike Technology Partnership**

Coretex, developer of compliance and fleet management solutions, has announced a technology partnership with Marcotte Systems, developer of process control and automation systems for the construction industry. The Coretex 360 construction solution provides dispatchers with granular, real-time visibility into the location, behavior and status of a construction-supply operation. The system contains a complete set of HD sensors specifically designed for use in a ready-mix environment, including bowl/drum rotation, water-added, load switch for aggregate and precise auto-statusing. "By combining Coretex's internet of things (IoT) platform with advanced tracking, integrated cameras, engine management and service data with Marcotte Systems' comprehensive process control and automation, dispatching software and batching systems, we have redefined the meaning of an end-to-end construction solution," said Alexandre Leblond, global vice president, sales of Marcotte Systems. The integrated product is currently on trial at ready-mix concrete sites and will be available during the first quarter of 2019. Visit coretex.org.



New Year on the Horizon

In preparation for 2019, what industry trends should contractors keep an eye on?



SCOTT ARIAS, PH.D.

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President, *ACE Consulting Company*



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A. PETER HILGER

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“Factoring in the growth in construction throughout 2018, the labor shortage will become a larger issue in 2019.

With a lack of skilled laborers, such as masons and carpenters, not only is the availability of skilled tradesmen an issue, but the skill level of the workforce is also lacking due to inexperience on the part of millennials.

This issue will drive a trend toward finding ways to limit on-site construction through prefabrication. Higher wages driven by limited availability; lower productivity due to an inexperienced, younger workforce; and expedited construction schedules are all factors that are driving the industry toward a modular framework. Along with this new focus, the need for on-site, skilled trade construction will be diminished.

The additional costs of prefabrication—attributed to transportation and factory assembly—will be mitigated by the lack of skilled workers and the increased cost of hiring them as a result of the limited pool.

This trend will be led by owners, who will budget based on the limitations of projects, thus pushing designers to become more cost-conscious in their materials decisions.

“The top industry trends that will affect construction next year are continued immigration enforcement and possible changes to family and sick leave.

Immigration and Customs Enforcement (ICE) has conducted about four times as many I-9 audits in the first half of 2018 than were issued in all of 2017. ICE has also arrested around 2,000 more undocumented immigrants per month than under the Obama administration and has conducted far more workplace raids. Employers that do not use E-Verify are an especially easy target for a raid or an I-9 audit. As such, all companies should audit their I-9 forms and ensure that their workers are authorized to work before ICE audits them.

Family leave may also change next year, as President Trump supports paid family leave. Both Republicans and Democrats in Congress have already made proposals to institute some form of paid family leave, which the majority of the public supports, so it is likely coming. Sick leave is in the mix also. When employees can take paid leave, companies should expect more employees to take extensive time off and should prepare to make the necessary policy changes.

“The only certain trend that contractors can look forward to next year is continued uncertainty. A confluence of concerns will start to breed a bit of caution in our otherwise red-hot construction economy.

Trade union agreements are being renegotiated, while labor shortages persist. Tariffs will have a yet uncertain effect, making materials prices potentially uncoverable and difficult to plan for on the part of contractors who have to lock in their own pricing as early as possible. While it seems counterintuitive, look out for business failures—especially in the subcontractor ranks—that could foretell a changing business landscape. Losses in the subcontractor ranks will have a compounding effect on general contracting businesses as well.

The labor market shortage continues to challenge us, but if the construction economy softens at all in 2019 and 2020, that will improve. We still are facing headwinds from 2018's industry changes and will be for many years ahead because of an aging workforce and lack of adequate replacement numbers. But if there is less work to go around, our diminished workforce will continue to be sustained, but with less pressure. So, craft workers can expect to be busy, even overly so, for a while.

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Start Planning Now for a Slowdown

How to pivot in a slower economy & maintain a healthy business



GEORGE HEDLEY, CSP, CPBC, is a professional construction BIZCOACH and industry speaker. He helps contractors build management teams and get their businesses to work for them. He is the best-selling author of "Get Your Construction Business To Always Make A Profit!," available on amazon.com. Email George at gh@hardhatpresentations.com to sign up for his free e-newsletter, start a BIZCOACH program, attend a 2-day BIZ-BUILDER Boot Camp or get a discount at hardhatbizschool.com online university for contractors. Visit hardhatpresentations.com for more information.

Ask George

To submit a question for George Hedley, email Editor Kathy Wells at kwells@cahabamedia.com.

Over the last 5 years, many contractors have seen their revenue grow as much as 40 percent, paving a path toward continued business growth throughout the industry. According to the latest Construction Financial Management Association's (CFMA) national member survey, net profit percentages for contractors have grown significantly over the last several years. However, with all the change and positivity flowing through the industry, it's still important to be prepared for a potential slowdown.

WHAT SLOWDOWN?

The majority of my construction clients are still looking to hire more project managers, superintendents, foremen and skilled laborers to complete the projects they already have on the books. Further increasing the pressure, employee compensation and benefits packages have grown at double-digit rates, costing a great deal more to complete the backlog of under-contract projects. The pressure is so great that many overloaded contractors are paying more than the market rate to poach people from their competitors. This momentum will continue to raise the cost of construction going into 2019 and impact the future of the ability of new projects to provide a financial return to end users, companies, investors and developers.

Most economic experts say the construction market should have another 2 years of positive 2- to 3-percent growth.

However, it all depends on what you build, who you build for, and where your work is located. Some contractors are still booming and continue to grow, making very high margins; while many construction businesses in certain areas of the country have already experienced a slowdown in new opportunities within their local economies, causing an increase in the number of competitors bidding and negatively influencing contractor markup rates. Looking at the big picture ahead, single and multifamily housing should slow down sooner than most other types of construction, as homes and apartment prices rise to an unaffordable level for buyers and tenants.

MOVING FORWARD

Remember when the economy shut down in just a few days back in 2008? Contractors who had bought new equipment, taken on high-priced employees and borrowed money based on their predicted ability to pay it back comfortably were stuck with more assets and payments than they could afford in a slower economy. They quickly learned that shiny new excavators aren't worth much when the market is flooded with slightly used equipment for sale.

Work slowed; lenders stopped paying construction progress payment draws on projects; banks called their lines of credit loan balances; and contractors didn't have enough money to keep their cash flow or profit wheel spinning. To make matters worse, developers couldn't fill their

projects with tenants or sell their projects, and, therefore, stopped paying builders and subcontractors.

Wherever you fit into the current industry scenario, now is the time to start reeling back your boom-time mentality and start planning for a slight potential slowdown, starting in the next year or two based on your location and the local economy. The future is definitely not certain—especially right now. Many factors can quickly converge and have a monumental effect.

PRIORITIES & OPTIONS

Before you become too depressed, remember: The economy is still great in most areas, and there is plenty of work to complete. Still, it's important to plan in case something happens that reduces the flow of business into your world. Consider the following areas in your plan to withstand a slower market.

1. *Cheap work*—Do you really need to go out and win another low-bid job, which will, in turn, cause you to have to hire another project manager, superintendent, foreman, or crew member? Will this decision make a significant difference in your net cash over the next year? Are there some jobs that are too risky for the low margins they will likely generate? Stop seeking low-margin work against low-priced competitors. Be more selective in what you pursue, and only go after high-margin projects. Meet with loyal customers and ask them to negotiate their next jobs at a lower margin than usual to ensure you have a steady flow of good work with your best customers moving forward.
2. *Unused equipment*—Do you own any highly valuable equipment that's not being utilized or is only operating at a 75- to 80-percent usage rate? If so, now is the time to sell it, even if it
3. *People*—Are there new people you need to hire to complete all the work on your books? Draft a manpower work-planning schedule. List out all of your current and committed projects to determine how many field workers, supervisors and project managers you'll need every week over the next 3 to 6 months. If possible, postpone starting any projects and use a labor rental company or subcontract some of your work.
4. *Cash flow*—Are there ways you can generate extra cash to build up a reserve in preparation for a potential slowdown? Do you have inventory or supplies in storage you may never need? Are you watching your working capital, receivables and cash flow to make sure you can survive a customer not paying you or having to operate for 3 months without getting paid?



5. *Debt*—With any extra cash you generate, pay off your high-rate loans and credit cards as quickly as possible.
6. *Outside help*—Have you met with your financial advisor and business coach to discuss your current condition and business health? They can help you proactively manage your business.
7. *Personal expenses*—Now is not the time to buy a new home on the lake, remodel your family home, buy a bigger car or boat, or take an extended vacation. Now is the time to prepare for a lower-profit construction market.

DON'T WAIT UNTIL IT'S TOO LATE

Planning is hard. It's even harder to change your business model, sell equipment, avoid hiring, or reduce expenses. Get your management team together and discuss the future. Set goals, make difficult decisions, and implement meaningful initiatives. Those who postpone reality do not fare well.

As another new year approaches, look at your business goals for the next 12 to 24 months and solidify them. Preparing for less than ideal times isn't easy, but experiencing hard times in the absence of preparation is worse. **CBO**

Why Close-Out Matters to Your Margins

Examining the phase between substantial completion & final acceptance



GREGG M. SCHOPPMAN

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On just about every project in the built world, an interesting phenomenon occurs: The line between substantial completion (a legal term used to define the moment a project is sufficiently complete per the contract documents) and final acceptance (the actual moment a project is truly complete) becomes blurred in the customer's eyes. For many contractors, both trade and general, this block of time represents a source of margin erosion for myriad reasons:

- *Personnel swaps*—Supervisors and managers are pulled from a project toward the end of a job to focus on new endeavors.
- *Misestimated punch list or deficiency list*—The punch-list process garners little respect, leaving a small amount of time for a large, important list of tasks.
- *Paperwork*—The as-built documents, operations/maintenance manuals, training, etc., become a distraction.

The common thread in each of these elements is a negative impact on the customer's business with and perception of the contractor. Pulling personnel too quickly leads to poor punch-list completion, a deluge of incomplete paperwork and clients' competition for your attention. Failure to observe the sanctity of the close-out process damages relationships and extends a company's risk profile. Best-in-class businesses are proactive in approaching close-out with the same fervor

they did commencement. Three critical elements describe an effective companywide close-out strategy: defined key performance indicators (KPI), a consistent and standardized approach, achievement of the customer's version of "done."

THE METRICS

Construction businesses continue the migration towards data-driven strategies, but they fail to use the data to drive decisions and behaviors. For instance: The proliferation of software tools that capture close-out data, such as documentation, and even punch lists, are ubiquitous. The first step to understanding the impact of close-out on a company is to mine the data and show the correlation of time and activities. Other critical aspects of close-out can be measured, including the following:

- *Punch-list/deficiency-list dollars*—All work associated with close-out is captured in one budget code, separating work packages.
- *Close-out compliance*—Whether it is the close-out strategy meeting or the gathering of documents, project personnel are recognized globally.
- *Change order activity*—The close-out phase forces change order closure, in many cases to the detriment of the project budget.

The most important aspect of any KPI is the connection back to the firm and its strategic relevance. For instance, change order

measurement may only be important to a business that experiences a high frequency of change orders and has a propensity to engage in high-risk closures. These should be used to place optics on close-out and influence upstream and downstream behaviors.

THE PROCESS & TOOL

Most companies have some semblance of a preconstruction phase, but lack a defined and consistent close-out process, with the process often triggered by some milestone or oversimplified during the preconstruction phase.

For instance, firms may have triggers tied to an inspection, man-hour percentage or internal phase, such as landscaping, final grading or final cleaning. The steps from there should include an internal meeting focused on strategizing close-out and an external meeting(s) that involves the customer and/or trade partners. Each item should have its own ranking (by level of importance), discussion on strategy, person in charge of its completion and target completion date.

Lastly, it is important to note that in most close-out discussions, there is little consideration given to the use of dedicated punch-list teams. As such, these groups are often riddled with problems including the following:

- **Cost allocation**—There becomes an internal battle over how much time is required, which can lead to a cultural war and/or internal divide amongst operational teams.
- **Punch-list punting**—When the project team knows a special crew is coming in to close, they relegate imminent tasks to punch-list items, leading to cost-allocation issues.
- **Utilization**—The company suffers cost overruns because of failed utilization of the procured close-out team.

THE CUSTOMER'S INVOLVEMENT

The most important voice in this process is that of the customer. What does “done” mean to them? This should be nailed down and reinforced during the preconstruction phase, as well as the close-out phase. Below is an example of questions and components that should be defined early and revisited throughout the construction process:

- **Document collection**—Short of the description in the contract, what will be expected in terms of the as-built documents (manuals, training, etc.) in both electronic and paper versions?
- **Punch-list process**—Who will do the punch list, and what is their experience with this process? What has frustrated them in the past? Will there be multiple inspections?
- **Owner vendors and suppliers**—These contractors are professionals but lack the element of specific job knowledge. In addition to notification of the selected parties—assuming they have been selected—it should be incumbent on the lead contractors to execute a coordination meeting as part of the preconstruction and close-out processes, as if said parties were on the team already. In cases where they have not been selected, the savvy contractor develops a proactive coordination timeline, working backwards to illustrate important decisions and considerations (e.g. fabrication, municipality, expectations).

Close-out is arguably the most important phase of the project because it represents so many milestones and leaves an indelible imprint on a customer's mind. They may forget a botched start, but failing to complete the nagging punch list can mean the difference in the award of the next project. **CBO**



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2018 Regulatory Roundup

What's new in licensing & how it could affect your growing business



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For contractors operating in multiple states, keeping up with changes in licensing requirements and the administrative preferences of licensing boards can be a challenge. To help your teams stay ahead of the game and ensure compliance, you must stay abreast of new laws and amendments. The following highlights recent changes in the regulatory landscape. Some make licensing or starting a business easier, while others pose new issues to consider.

TEXAS

This summer, Texas made it easier for new and out-of-state businesses to register under the entity name of their choice. Under prior law, the use of names that were “deceptively similar” to that of an existing business were barred. Texas Administrative Code 79.38, effective June 1, dictated the name must merely be “distinguishable.” By lowering the bar and more clearly defining the terms, the change was expected to reduce rejected filings due to name conflicts.

SOUTH CAROLINA

South Carolina recently eased application requirements for general contractors with Statute 40-11-262, signed into law May 18, which allows contractors to submit a surety bond in place of a financial statement for both renewals and initial applications. The change is effective with the present renewal cycle. The change makes

it easier for companies that recently formed an employee stock ownership plan (ESOP) to affirm their financial status, among other benefits. Also in May, the South Carolina Contractor's Licensing Board announced that it would begin enforcing requirements for mechanical contractors (air conditioning, heating and packaged equipment) to display their mechanical license in an area accessible to the public at their principal place of business. The contractor's mechanical license number must also be displayed on all commercial vehicles, invoices and proposal forms.

NORTH CAROLINA

The North Carolina Licensing Board for General Contractors also enacted display requirements in 2018. Under 21 NCAC 12.0501, approved April 1 and announced in fall 2018, general contractors must include license numbers “on all contracts, advertisements and licensed websites.” For guidance, The Carolinas Association of General Contractors (AGC) provides helpful context. After 93 years of paper filings, the licensing board also unveiled NC Contractors Licensing Central, an online license renewal system. As of October, the board no longer mails out paper renewal application forms.

ALABAMA

Alabama also ceased mailing paper renewals in 2018, requiring contractors to download renewal forms online.

NEW JERSEY

In March, the New Jersey Department of Community Affairs eliminated permit and inspection requirements for roofing and siding work on one- and two-family residences. The new requirement classifies those project types as minor work and ordinary maintenance.

OREGON

Oregon eased licensing requirements for contractors under House Bill 4144, signed into law in April. Effective January 1, 2019, individuals with at least 8 years of construction experience may apply for a new residential contractor's license without having to complete the prerequisite training. The individual will still need to pass the test for a Construction Contractors Board license and must form a business as a sole proprietor. The law further provides license fee waivers and other financial support measures, designed to help construction professionals transition into ownership.

MINNESOTA

Minnesota increased licensing requirements for work done under the state's Property Assessed Clean Energy (PACE) program by requiring that all installations be completed by contractors licensed through the Department of Labor and Industry. The new requirements took effect May 1.

HAWAII

Hawaii will begin licensing home inspectors in July 2019. Under Senate Bill 2043, it will be unlawful to engage in home inspection without a home inspector license, subject to a \$1,000 fine for each offense.

INDIANA

Indiana recently passed legislation requiring registration of underground utility excavation contractors. In addition, Public Law 93-2018 requires those conducting excavation or demolition under contract with a communications service provider or utility to include a statement in an entity filing with

the secretary of state that says the contractor and their employees will comply with Indiana's 811 "Call Before You Dig" statute (among other requirements).

VIRGINIA

Effective July 1, Virginia's amended VCA 54.1-1115, the statute governing prohibited acts by contractors, states that a "construction contract entered into by a person undertaking work without a valid Virginia contractor's license shall not be enforceable" unless the contractor "gives substantial performance within the terms of the contract in good faith" and was unaware of license requirements. Other provisions are provided under the clarified statute as well.

CALIFORNIA

The Ninth Circuit Court of Appeals recently reversed a district court's ruling that excavation related to installing ground cable was beyond the scope of a contractor's low-voltage C-7 California contractor's license. The case, *MP Nexlevel of California, Inc. v. CVIN, LLC*, concerned \$18.1 million in payments for a 1,371-mile fiber-optic cable network installation project. Following a dispute, the owner sought to deny payment

for the project under California's unlicensed contractor law, asserting that the contractor's license didn't cover excavation work. A district court agreed.

On appeal, the contractor's case was bolstered by a representative of the Contractors State License Board, who testified that the board had always interpreted the C-7 license statute to include the kind of excavation and trenching work performed by the contractor. The official indicated that any work done outside the scope of the license in the case would fall within the "supplemental and incidental" exception. The Ninth Circuit reversed the lower court's decision, sending the contractor back to court in pursuit of payment. The outcome of this particular case will be significant for low-voltage contractors operating in California.

There's much at stake for contractors when it comes to state regulatory requirements. Ensure your business is properly registered and licensed for all of your activities by getting expert assistance with every aspect of entity management and licensing while also leveraging the appropriate compliance software. **CBO**



Accurate Data = Accurate Forecasting

How the predictive-cost model is transforming construction

BY NOAM REININGER

Preconstruction planning is one of the most challenging aspects of the construction life cycle, and it has been for quite some time. But that's all changing, in part due to data science and the predictive-cost model.

Conventionally, business owners, facility managers and construction professionals relied on historic prices and localization factors to provide reasonable, accurate costs to build. While these costs and factors were helpful in creating budgets, stakeholders grew dissatisfied with the lack of accuracy in the approach. Between market volatility, unpredictable commodities prices and a shrinking labor pool, historical data is simply unreliable.

Access to predictive data that accounts for real market conditions is critical for budget management, from design through construction. Data science now empowers business owners to supplement historical data with reliable cost projections.

PREDICTIVE COST VS. TRADITIONAL FORECAST

Predictive-cost data addresses the shortcomings of traditional forecast data. It was created and is maintained using a hybrid methodology that combines classical econometric techniques with contemporary data-mining methodology. Although it is based on econometric principles and



modeling techniques, predictive-cost data differs from traditional econometric forecasts in two ways.

First, traditional econometric forecasts are based on macroeconomic theory, even when analyses of historical values of those macroeconomic indicators demonstrate them to be statistically insignificant predictors. Predictive-cost models disregard theory and are based exclusively on data-driven, empirical evidence instead. This empirical evidence is the result of extensive exploratory data analyses and

pattern-seeking visualizations of historical cost data with economic and market indicators prior to model development. This approach, an update to the centuries-old, theory-driven process, has been extensively researched and validated by Dr. Edward Leamer, professor of global economics and management at The University of California, Los Angeles (UCLA). Only economic indicators that have proven themselves in exploratory analyses become candidates for model development, testing, validation and resulting predictive-cost estimates.

Second, predictive-cost data uses mining techniques and principles to improve traditional econometric modeling practices. Since the 1990s, this family of processes and analyses has evolved from a mix of classical statistical principles to more contemporary computer science and machine-learning methods. Data-mining methodology is specifically designed to analyze observational data instead of experimental data, as in classical statistical and econometric techniques. It is a robust methodology that takes advantage of recent increases in computing power, data-visualization techniques and updated statistical procedures to find patterns and determine structural drivers of construction material and labor costs.

Measures of these drivers and their relationships to each other and to construction costs (along with their associated lead or lag times) are then represented in

a statistical algorithm that predicts future values for defined materials and locations.

BUDGETING WITH PREDICTIVE-COST DATA

One of the big challenges for design and construction teams is managing the budget. Predictive data does more than give an estimate of the total cost and scale them over time; it allows you to optimize the entire build schedule and has been used to predict the cost of construction up to 3 years before the project breaks ground.

Conceptual square-foot models are normally within 20 percent of actual costs, but applying a true predictive multivariate database—including individual material, labor and equipment data—can improve the accuracy of a conceptual estimate, allowing owners, architects, engineers and other construction professionals the ability to plan projects more confidently.

Ultimately, the core value of using predictive-cost data at the material, labor and equipment levels is the unprecedented ability to understand future costs for better planning. Predictive-cost data will not solve every preconstruction planning difficulty, but it is a leap forward in terms of estimate accuracy and preplanning efficiency. **CBO**

As vice president and chief data officer at Gordian, Noam Reininger leads the development of comprehensive data and analytics solutions that solve the unique challenges the construction industry faces today. Reininger's expertise includes a keen understanding of how data and insight-driven solutions can transform and grow businesses. Prior to joining Gordian, Reininger served as senior vice president of products at Dun & Bradstreet, where he led a portfolio of data-management solutions focused on the Fortune 500 sector. Visit gordian.com.



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The Meaning of Malicious

Understanding cyberrisk & creating awareness in your IT processes

BY ADAM COTTINI & BRIAN COOPER

As businesses become increasingly reliant on technology, they are exposed to cyberrisk, regulatory oversight and, potentially, liability for their employees', clients' and business partners' data violations. New tools and technologies help contractors manage data, control systems and deliver services, while improving collaboration and efficiency between engineers, architects, building owners and contractors.

However, that data and the systems that run it are vulnerable to human error and malicious attack, and the contractor can be liable for the consequences—even if the data is held by a third party, such as a subcontractor, information technology (IT) vendor or cloud provider.

Construction companies are responsible for the safekeeping of data entrusted to them. That data could be employee information, including personally identifiable information (PII), such as names, addresses, Social Security numbers, credit card information, etc. It also includes intellectual property, contracts, project data, bids, plans, specifications, business information modeling (BIM) systems, and equipment controlled by supervisory control and data acquisition (SCADA).

Employee negligence or malicious acts, or the failure of internal processes, can lead to a breach of private information or



unauthorized access to systems and data. Employees must be trained regularly to spot and report phishing attempts. They must also be reminded not to access unauthorized third-party applications, social media accounts, etc. Construction businesses not only have potential liability to others whose data they hold, but they are also exposed to their own loss due to failure of computer security or a breach of privacy. Of course, contractors also face threats from

outside the organization—from criminals: hackers, corporate espionage and nation states. Motives for malicious acts vary, but the damage caused can be severe.

For example, while the aim of many ransomware attacks is to look for easy money, some disguise attempts to take intellectual property that will shortcut their own development, and others attempt to disrupt our whole society. This year, the United States government has blamed North Korea for the

WannaCry ransomware attacks and Russia for the cyberattacks that targeted American and European nuclear power plants, water and electric systems.

Contractors should make sure that their vendors (for which they are likely responsible, contractually or otherwise) manage their own security and privacy risk. Construction companies can be particularly exposed in this area through their reliance on IT consultants, cloud providers and other business partners—all of which have the potential to lead to the interruption of projects and the introduction of liability to contractors.

Increasingly, principals and owners require their vendors to match the privacy/security obligations that apply to them. This imposes good security/privacy practices on the vendor and passes responsibility and liability down the contractual chain.

Construction businesses are similar to those in other sectors in that they are entrusted with data that belongs to their employees and business partners—PII like health and financial information. However, engineering and construction organizations face additional cyberrisk through their use of specialized technologies and applications in the management and delivery of projects and services.

Those tools and applications include the use of cloud providers to store data and run software; mobile devices to facilitate on-site tracking, reports, logistics and analytics; 3D and 5D BIM; Intelligence Community Standards (ICS); SCADA; drones and other autonomous machinery; robotics and biometrics. These tools and applications help with productivity, collaboration and margin, but they bring risk that impacts projects, relationships and completion schedules.

Construction businesses are particularly vulnerable to claims alleging breach of confidential business information (bid and project data/specifications, owner processes and project management); unauthorized

access and interference with project plant, data and specifications in SCADA and BIM; bodily injury and property damage through failure of devices; robotics, and remote control of processes and physical security; and liability for delay and business interruption caused by unauthorized access to project data and systems.

Additionally, organizations are exposed to their own costs of responding to a breach in terms of notification to affected individuals; the cost of forensic investigation to establish the cause and extent of the incident; data restoration; and business interruption.

In the U.S., the construction industry overlaps with nearly every other sector of the economy, and all states now have privacy regulations that require notification of breaches of personal information. Clients include regulated entities, such as financial institutions and healthcare entities, that are subject to strict cybersecurity and privacy regulations.

Even some government agencies have been hacked in recent years, including the 2015 and 2016 hacks of the U.S. Office of Personnel Management (OPM), Federal Bureau of Investigation (FBI), Department of Homeland Security (DHS) and Internal Revenue Service (IRS). The now take an increasing interest in enforcing data and privacy requirements on contractors.

In a 2017 amendment, the Federal Acquisitions Regulations (FAR), defined PII and required that a contractor train their employees on maintaining proper records and ensuring that subcontractors comply similarly before giving employees access to sensitive information.

In addition to the state breach-notification and data-security laws, construction companies are further subject to numerous state and federal laws and regulations. Examples include DHS, Homeland Security Acquisition Regulation (HSAR) and, as business associates, the Health Insurance Portability and Accountability Act (HIPAA).

Cyber insurance is one part of a planned risk management program and assists not only with risk transfer, but with loss of income, breach response and post-breach services as well. Traditional insurances, such as property or general liability, were not designed to address cyberrisk, so a specific cyber policy is needed to address the unique risks surrounding data privacy and computer security.

The construction industry's use of and reliance upon new technologies brings cyberrisk that must be actively managed through policies and procedures, contractual terms and risk transfer. Regulations increasingly overlay contractual responsibilities in this area, and principals (including government agencies) are rapidly imposing requirements on contractors that are becoming new industry standards.

It is incumbent upon construction businesses to take steps to manage and mitigate their cyberrisk. Set the tone from the top by establishing policies, procedures and standards for ethics and integrity; data encryption; employee training and awareness; segregation of data; proper funding for systems and their maintenance; contract negotiation with subcontractors and vendors; and incident response plans. **CBO**

As managing director of Gallagher's Cyber Liability Practice, Adam Cottini is responsible for the practice's overall direction, including development of state-of-the-art solutions, insurance-gap analyses and risk-exposure analyses, as well as the implementation of best practices. He has more than 13 years of cyberrisk management brokerage and consulting experience.



As managing director of Gallagher's Construction Practice, Brian Cooper serves clients, including general contractors, heavy highway/engineering firms, subcontractors, developers and buyers of construction services. With over 40 years of insurance-related construction industry experience, Cooper manages accounts utilizing wrap ups, captives, property/casualty, architect and engineer solutions. Visit ajg.com.



The Industry's Growth Trajectory

Today's economic trends & the part they play in shaping your success

BY TODD A. FEUERMAN

The construction industry continues to gain momentum as 2018 comes to a close. Backlogs are generally substantial, but recent trends have indicated that the release of work into production is somewhat unpredictable and is subject to delayed starts. This trend is likely to continue due to a number of factors, including regulatory agencies releasing work and funding for larger projects being garnered, such as Hudson Yards in New York City, which will be the largest construction project area in the history of the United States.

A recent survey of ENR's top 400 contractors, as a group, revealed the firms generated \$375 billion in contract revenue in 2017, compared to \$366 billion in 2016—an increase of 2.1 percent. The contractors interviewed believed that the trend would continue throughout the latter part of 2018 and into 2019. Additionally, recent reports issued by Dodge Construction suggest that U.S. construction starts will increase by 3 percent with additional room for expansion.

One key factor predicted to ensure continued growth in the construction industry is the Tax Cuts and Jobs Act of 2017 and the potential infrastructure spending to follow. Another element providing a boom to the industry is hurricane rebuilding in the Southeastern region of the U.S., as well as other natural disaster rebuilding from the wildfires in the Western region of the U.S.



The construction market has benefited in specific geographical regions during 2017 and 2018 from large construction projects. The completed projects include new campus facilities for high-tech giants, such as Google and Apple, and continued warehousing and distribution centers worldwide for Amazon. For Amazon, this trend will likely continue into 2019, specifically as it relates to Amazon's second North American headquarters, which may be under at least some level of construction in 2019. As more of these giants continue

to grow and expand in the market, the need for mega-construction projects and related infrastructure projects should follow.

Certain sectors of the construction and development arena have been and will continue to be impacted more favorably than others in 2019. For example, solar and power construction should continue to improve and provide steady growth, while amusement and recreation construction spending have proven unpredictable. State highway funding may see some improvement, even with the uncertainty regarding



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federal funding for large projects. Airport and train infrastructure also continue to show signs of significant improvement. Each of these sectors have been impacted by project funding and political scrutiny toward large projects. However, once jobs are released, there is a generally a significant windfall of construction work that enters the marketplace.

STRATEGY

While there are more than favorable signs of continued growth in the construction industry, there are still legitimate fears, pushing some to proceed with caution. Some risk factors causing trepidation in the market include:

- Political and regulatory uncertainty
- National economic uncertainty
- Local and regional economic uncertainty
- Rising material costs
- Rising interest rates
- Immigration employment protocol changes
- Skilled labor shortage

As the industry has improved over the past several years, construction companies have been able to rethink their approach to the market and reallocate resources to projects that will provide better financial return with more controllable risk. As the quantity of opportunities continues to increase, so will the overall quality of projects available for bidding. Many construction companies have harnessed the favorable conditions provided by these trends as a chance to focus on what they do best (as opposed to simply accepting any project opportunity that comes along).

LABOR

The biggest issues that the industry continues to face are the extremely tight supply of skilled workers and the perceived negative notion younger workforce entrants have of construction. With baby boomers set to retire within the next 5 to 10 years and the

intense federal pressure to limit and reduce the immigrant labor force coming from Mexico and Central America, the construction industry is faced with the monumental task of finding workers despite the many barriers to employment.

Industry lobbyists and special-interest groups continue to address these issues at the state and federal levels in an effort to develop funding for trade education programs, apprenticeship programs and ways to create a softening approach to immigration protocol, which should all help to some extent.

However, time is not a friend to this issue, and training is critical to develop the workforce needed to complete the current backlog and future projects.

MATERIALS

Unfortunately, in another blow to the industry, building materials costs have continued to increase due to high demand, attributable to the influx of available general and specialty construction projects. Steel costs have become particularly problematic, as the political pressures levied by the tariff costs continue to affect relationships between the U.S. and its trading partners.

In addition to steel prices, the varying fluctuation in the oil industry has continued to impact the price of almost every component used in the construction industry. Based on oil's nature as a commodity, this isn't likely to change in 2019.

TECHNOLOGY

Advanced technologies are beginning to become the norm in the construction industry. An industry that was once perceived as archaic is now looked upon as cutting-edge. The use of building information modeling (BIM) collaboration, cloud computing and mobile data has and will continue to be a critical asset for construction companies to properly manage operations.

In addition to back-office technologies, construction businesses have been effectively implementing technology in the field

as it relates to personnel, equipment and real-time jobsite viewing.

While GPS technology continues to be used in construction, visual job inspections and oversight has been impacted by the use of drones, which have become more prevalent in conducting site surveys, site inspections and general site management. Drones have proven to be invaluable for producing quicker and more accurate land surveys, while reducing the costs associated with inside and outside labor. Contractors have been able to more effectively manage multiple jobs on more complex and dangerous jobsites.

BOTTOM LINE

The 2018 U.S. construction market continues to experience solid growth and is expected to continue with this trend into 2019. While significant backlogs are always a good problem to have, they are a problem nonetheless.

For many contractors, the ultimate completion of this work will be based upon a continued stable economy, improved international relationships, political policy clarification and, most importantly, finding the workers to complete the projects.

In other words, a solution to the skilled labor shortage is imperative. An economy is only as good as the men and women that participate in its success, and the construction industry cannot support an influx of projects without the right people and supplies to complete them. **CBO**

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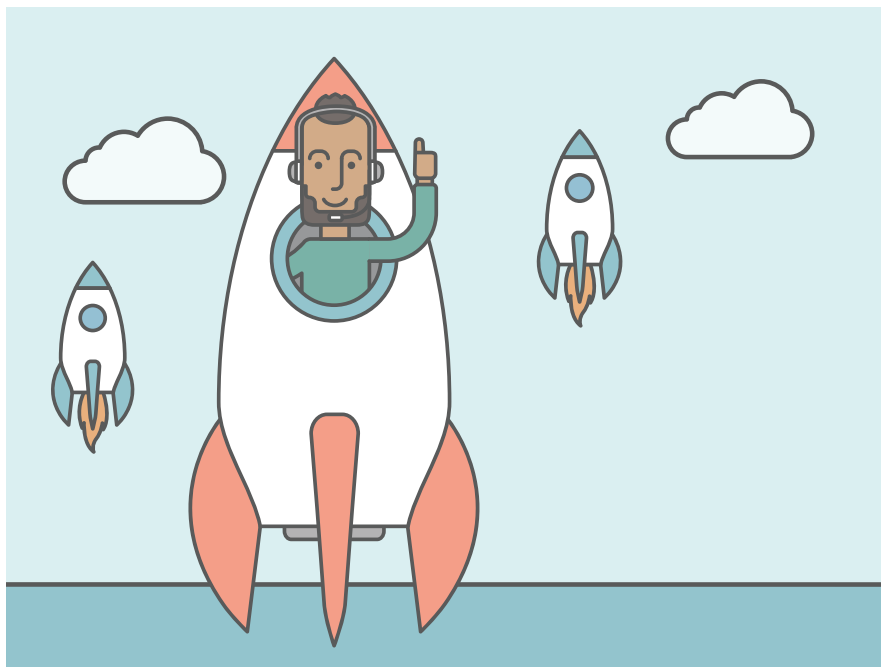
4 ways to generate more promising customer leads while adhering to data-protection regulations

BY MELANIE PHILION

Historically, many companies have invested large sums of money to purchase customer lists from database and marketing companies before beginning the long process of importing those contacts into a customer relationship management (CRM) system. Then ensued the cold-call campaign, which has since declined in effectiveness as a method of client acquisition.

Looking for another solution, many companies turned to mass email strategies, but with the proliferation of inbox filtering, this method of lead generation became much more difficult. As sales representatives became unable to successfully connect with clients, qualifying cold-call leads eventually fell out of focus for many businesses.

Although some companies continue to buy lists, spamming prospects and customers, more and more companies are using social platforms, search engine optimization (SEO), online and professional connections. Now, potential customers gather information on your business and come to you with a real interest in your company's products and services when they are ready. Alongside any new development in the way businesses are run, each sector must change with the times and statutes. As such, business development must adapt to the current communication era, and today's technology is shifting it in a new direction.



1. END ALL SPAMMING

For many years, the only way anyone could find new customers was through the cold-call method or by sending tons of emails to a list of unqualified leads. Those on the receiving end came to view these actions as a gross abuse of information, causing the United States to enact state laws that protect consumers against unapproved email and telephone solicitation. Thus, this method became much more difficult for sales associates to reach and engage with new customers.

Other countries, such as those in the European Union (EU), are drastically reinforcing those laws with statutes like the EU General Data Protection Regulation (GDPR). Companies now have to obtain an implicit or explicit consent from the customer before sending mass email.

For example, in Canada, as part of the Controlling the Assault of Non-Solicited Pornography and Marketing (CAN-SPAM) Act of 2003, sending emails to people without an explicit or implicit consent is illegal and, therefore, subject to a lawsuit.

Fortunately, setting up a consent authorization is relatively simple. If your marketing department is using a platform to send mass emails, you should easily be able to set up a consent-screening process and have it up and running in no time.

2. OPTIMIZE ONLINE PLATFORMS

Online platforms allow your company to request the consent to contact specific consumers who have shown a real interest in your products and services. Once you have received their consent, you can begin generating leads by emailing those new, potential customers. Consider the following basic steps to get started in your new email efforts:

- For every form in use on your company website, make sure you also have a subscription opt-in that includes a petition for the customer's email address. The information in this

message can be short and should explain that the customer must agree to receive emails regarding your company and that he or she may choose to opt out at any time.

- Create landing pages that will attract people searching for something specific. Landing pages are built to present and showcase an event or product. The pages should also be indexed with highly specific keywords, making them easier to find and more likely to appear in related searches.
- Social media platforms are also helpful places to find new leads. For example, you can leverage LinkedIn, Facebook and Twitter to promote an event, document or webinar. Some platforms offer lead-generation tools able to create look-alike audiences based on your followers and other information you may already have.

The effect of this approach is completely different than solicitation. Here, technology works like a net that catches people who show interest and filters others out. However, procuring those leads is not the end of the story. Success requires following up and understanding that this relationship is quite different, making it imperative to nail down your approach.

3. KNOW YOUR CUSTOMERS

Due to the wealth of information available online, customers are much more knowledgeable than they were in the past. They have already shopped around when they reach your website. They have also read blog posts, reviewed comments from other customers, and have a better idea of your products, services and capabilities. So, they have price expectations based on their findings. Consequently, the customer expects (at least) the same level



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of knowledge about their needs on your part, since you have much greater access to industry analytics and customer demographics information. Therefore, asking the customer's basic information—like company size and revenue—is considered a faux pas in the web-generated relationship.

Additionally, you must ensure that your CRM integrates data that will provide all basic customer demographics information and more.

Today, your company's sales representatives should not only see information about the prospect (company name, number of employees, revenue, etc.) but also people they know, schools they went to, companies they worked for and more. This information is now richer than ever, and proof of knowledge on the sales representative's end boosts their credibility and furthers their business development skills.

4. UTILIZE SALES INSIGHTS

When it comes time to decide whether or not to invest in one specific customer over another, sales professionals rely mostly on instincts. Nevertheless, it is nice to have true indicators to help make the decision.

To the rescue comes the data, as analytics are not confined to opportunities in the pipeline. CRM systems use machine learning and mathematical science to enrich contact profiles, allowing you to examine relationship health and generate a reliable lead score. Sales insights gathered through predictive models that score and prioritize leads enable sales and marketing to know in advance which consumers and business are most likely to purchase their products and services. In this way, CRM becomes an intelligent tool that provides sales representatives the information they need to build strong, effective customer relationships.

Your company can evolve toward a more modern business development model when you utilize sales analytics and insights gathered through the resulting data. CRM elevates business development by allowing your sales team to deliver new value-added information to prospects and simplifying the decision-making process. After all, why merely drive your business development when you can turbocharge it? **CBO**

Melanie Phillion has over 6 years of experience with Microsoft Dynamics 365 and more than 10 years with CRM. Her experience spans multiple industries, including insurance and legal services, aerospace and defense, technologies and telecommunications, the United States federal government, and much more. Phillion has implemented more than 20 projects from beginning to end. She has extensive knowledge on the different Microsoft products to bring the best and most effective solutions to her clients. Visit dynamics.microsoft.com.

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IRMI's 38th CRC Boosts Awareness

2,000 industry professionals convene to talk trends & tackle emerging risks

BY KATHY WELLS

The International Risk Management Institute Inc. (IRMI) held its 38th Construction Risk Conference (CRC) November 4-7 at the Marriott Marquis in Houston, Texas. The CRC hosted over 2,000 construction and risk professionals, along with industry thought leaders to talk trends and tackle emerging risks in construction, and provide practical solutions and best practices. Over 600 contractors were represented, as well as many major construction insurance providers. IRMI reports that attendees were comprised of 36 percent construction firm representatives, 25 percent agents and brokers, and 22 percent insurers.

SHARPENING SKILLS

According to Ann Hickman, IRMI's editorial director, the goal is always to provide the best educational and networking experiences in the industry. "We give attendees a wide variety of topics to choose from and we screen speakers thoroughly to ensure attendees leave with tools and strategies they can go back to their offices and implement," Hickman said. "We try to include something for everyone. For those in the early stages of their career, we always include some sessions that cover the basics of construction risk management; and for the seasoned veterans, we provide advanced topics that take a deeper dive,



Left to right: IRMI President, CEO & Conference Co-Chairman Jack Gibson, CBO Editor Kathy Wells, Charles Pankow Builders Ltd. Chief Risk Officer Dick Walterhouse, and Charles Pankow Builders Ltd. General Counsel Ed Farricker

such as emerging technologies, changes in insurance case law, and public/private partnerships."

This year's curriculum featured three general sessions and over 40 sessions presented by more than 80 nationally recognized insurance, risk management, safety and surety experts.

A new course option called "Snap Talks" provided four separate, high-level

talks, during which attendees took in concentrated content covering better management techniques and technology tools with implications for insurance and construction. Other popular sessions included the "Interactive Risk Managers Forum" and "My Wrap Doesn't Wrap!," discussing common coverage issues that arise in the wrap-up process, including coverage gaps, eroding or insignificant limits, from



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the perspective of both the insurer and the insured. Also of note was “Impairment in the Construction Workforce,” a session covering the spike in functional and cognitive impairment in workers and the expansion of legalized medical cannabis.

EXPLORING TRENDS

With CRC taking place during midterm elections, economic concerns were top of mind. The topic of United States infrastructure spending was one of the most pressing topics at hand. “Where is it? We were promised all this money and here we are with a lack of spending,” said Karen Reutter, Zurich North America’s head of construction. “There are some states investing billions, but in Wisconsin, there’s nothing. And even more so, it’s been reined in. I look at bridges and I think the construction industry has just not yet seen the spend,” Reutter said.

The week following the midterms and the conference, U.S. voters approved at least \$24.4 billion in bond initiatives to support construction projects across different segments. The majority of the bond proposals were in California—approximately \$16.4 billion in borrowed funds—with the goal of improving the state’s water infrastructure, schools, hospitals and more. This is a trend that construction business owners and top insurance executives alike will continue to monitor.

Reutter took on her current role in September and has a keen eye on industry trends. Generational diversity is a topic she will be addressing at Zurich, and it’s one she views as a great point of interest for the construction industry as a whole. “By nature, the industry respects experience (meaning age), and what we have to do as an industry is become more generationally minded,” Reutter said.

“Generational diversity is important in construction, as future clients and teams will be tech savvy. We need to learn from younger generations, as well as older ones. We need to listen and build on that.”

Reutter is not alone in her opinion. The skilled labor shortage and its effects on the industry, construction business owners and their teams, were addressed heavily throughout the majority of CRC sessions.

According to IRMI President, CEO and Conference Co-Chairman Jack Gibson, “The lack of qualified and well-trained workers, supply chain challenges, and construction defects continue to be some of the most difficult risks for contractors to manage and insure,” and working to solve these problems is part of IRMI’s goal.

According to CRC presenter and Travelers’ Senior Construction Risk Control Consultant Casey Banks, “Attracting the right people and onboarding them and the

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influx of millennials are how we bridge the gap between generations.”

Banks co-presented a session called “Creating a Technology Plan for Managing Construction Risk” with Michael Fraser, vice president of business development at Triax Technologies, and Donald Naber, senior vice president of risk management at Gilbane Building Company. The three recently partnered to outfit more than 130 workers with wearable devices on a six-story, 60,000-square-foot New York City jobsite over the next 20 months. By increasing jobsite technology and leveraging the data from it, they hope to determine how wearable technology can keep jobs on track and keep workers safe.

RECOGNIZING EXCELLENCE

New this year, the Bill McIntyre Leadership Award was presented to Dick Walterhouse, chief risk officer of Charles Pankow Builders

Ltd., recognizing his contributions to the industry through innovative risk management strategies and tactics. Walterhouse has worked in construction risk management for 40 years and led his company to develop a “zero-accident culture.”

The Gary E. Bird Horizon Award was presented to Michael Feigin and Jeffrey Hutchens of AvalonBay Communities Inc., for their innovative loss prevention program designed to eliminate construction site fires on wood frame multifamily projects. Their approach focuses on four key pillars that use a combination of innovative building processes, new technologies and a novel wood treatment. Although designed for with wood frame structures in mind, their approach has applications for fire loss prevention and elimination beyond wood frame construction as well. “Bringing all four risk mitigation pieces together is an innovative and all-inclusive approach that goes above

and beyond the immediate addressing of the issue,” said Travelers Vice President of Construction Jennifer Lee.

“This is a game changer,” said Total Facility Solutions Regional Environmental, Health, and Safety Manager T.J. Lyons. “The basics of conventional safety have been gathered in a practical approach that now seems like an obvious fix—a fix that will save the lives of sons and daughters this firm will never meet.” Lyons was honored with the IRMI Words of Wisdom (WOW) Award, which recognizes outstanding contributions from a CRC speaker with exceptional presentation skills.

The 39th CRC will be held November 10–13, 2019, in Seattle, Washington. Register at irmi.com/conferences. **CBO**

Kathy Wells is the editor of Construction Business Owner magazine.

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The Era of the Digital Contractor

Sachse Construction's tactical approach to modernizing operations with technology

By Andy Holtmann



Kathy Sulik, Project Manager, Sachse Construction (left)
Andrea Wright, CEO & Founder, CTP Solutions LLC (right)

The world around us continues to evolve as new technologies are developed, and contractors are under increasing pressure to digitize and modernize their own operations to keep pace with client demands. Cloud computing, mobile devices and apps, sophisticated and integrated construction management software, drones, artificial intelligence and many more advancements are reshaping an industry that once lagged in technology adoption. Now, a powerhouse of dynamic digital contractors is preparing to lead the next wave of innovation.

One of these digital leaders is Sachse Construction—a premier commercial construction firm recognized as one of the most trusted and respected construction partners in North America. Founded in 1991 and headquartered in Detroit, Sachse Construction has built millions of square feet of projects spanning the retail, commercial, multifamily and institutional sectors. The company's strategic growth and success can be attributed to building strong relationships with clients and embracing the latest technologies to foster project innovation and find new ways to work smarter.

A NEED TO MODERNIZE

For Andrea Wright, Sachse's approach to technology is just common sense. "It's about using technology to more efficiently and effectively manage your projects."

Wright spent just under 7 years with Sachse as the firm's director of empowerment, handling the company's training, processes and enterprise resource planning (ERP) software. She has helped guide Sachse through technology changes, including the implementation of a new construction management software platform. An ardent proponent of technology, Wright recently started her own company, CTP Solutions, LLC, to help contractors, including Sachse Construction, modernize their operations and maximize team member potential.

"It's imperative for contractors to embrace change and digitize," Wright said. "Construction has traditionally been way behind in terms

of technology, but that's quickly changing now. If we want to appeal to younger generations of construction professionals, we've got to get in the game. Contractors are also being required to build faster, smarter and have more mobility—to do things in real time at the office, at the jobsite, on the go. If you are not leveraging technology to do that, you're just not going to get the job done anymore."

Kathy Sulik, a commercial project manager for Sachse Construction, said that as clients become more sophisticated themselves, they're increasingly wanting to use contractors that leverage and embrace the newest technologies as well.

"We're finding that as part of the request for proposal (RFP) process, clients want to know what kind of technologies we use," Sulik said. "We're going after some of these companies that are on the cutting edge of technology themselves, and if we're not keeping pace with them in terms of the technology we use, we could find ourselves not able to even get our feet in the door with them."

But how do construction managers, especially those with limited internal resources and IT staff to facilitate significant technology and process changes, get started? Wright said the journey begins with vocal advocates for change and putting an action plan in place.

THE TECHNOLOGY JOURNEY

Sachse began embracing technology long before Wright came on board. Around 15 years ago, when the company needed a way to organize contacts for projects, its teams created a global address list, or GAL program. Soon after, a developer was brought on staff to turn the GAL into a proprietary software for operations and estimating. As the business grew, different components were added to fill any needs that arose. Sulik said the biggest hurdle was that the GAL couldn't connect to the company's accounting software at the time.

"The GAL managed changes, but it didn't manage the contract or budget," said Sulik. "If we went to accounting for a job cost report, those costs could be outdated by the time the work occurred in the field. Then, you had to get a paper invoice, and you could have a



“Contractors are being required to build faster, smarter and have more mobility—to do things in real time at the office, at the jobsite, on the go. If you are not leveraging technology to do that, you’re just not going to get the job done anymore.”

month’s lag time before costs hit your job. That’s a huge gap in your project financials.”

To make matters worse, Sachse Construction’s retail group had projects that moved quickly—anywhere from 6 to 12 weeks long. “The job is finishing up and you’re just now getting data from your accountant. You’re just running blind,” Wright said, noting that the company explored every possible workaround with its software programs. “We had to make a decision. Were we going to be software developers or run construction jobs?”

Wright and Sulik were among a leadership team Sachse Construction created nearly 3 years ago to look for an ERP software platform designed for construction that would house operations and accounting in one system and share the same data. The company also wanted a solution that was scaled to accommodate both company growth and future technology advancements, as well as a vendor through which it could forge a technology partnership.

The Sachse team conducted research, studied reviews and sat through countless software demos. They also invited end users into the process to solicit their input, providing a layer of transparency throughout the entire organization.

Peer-to-peer networking offered the most insight. The team split up more than 30 companies, contacting each to see what solutions they were using, how they were using them and what results they achieved.

In the end, Sachse opted for Viewpoint’s Vista ERP solution and the integrated Viewpoint Team project management platform to replace both the accounting and proprietary operations software. Sachse’s team found these software solutions to have the complete, integrated functionality they were looking for.

The solutions also provided cloud-based accessibility, which tied together field and office operations, providing automated workflows and collaboration that have helped the company realize significant boosts in productivity and project control.

“The user-defined fields that the software provided were important,” Wright said. “When updates were made to the software, they didn’t break the user-defined fields or the customized reports. That data integrity was important to us and we found that other software couldn’t do that. We also liked the business intelligence tools the

software provided and that Viewpoint shared a similar technology strategy and was continually evolving and investing in its products. That was key to a long-term technology partnership.”

OVERCOMING FEARS: A TECHNOLOGY COMMITMENT

JBKnowledge’s 2017 Construction Technology Report found that construction companies tend to adopt software at the departmental level rather than organizationally. In many cases, contractors select out-of-the-box solutions that aren’t tailored to the construction



industry or don't integrate well with other software programs already in use throughout the company.

Two key reasons for this? Fear of disruption and change and a general lack of understanding how technology can improve construction professionals' day-to-day lives.

"People don't like change because they often don't understand the why," Wright said. "It's important to communicate and let them know it's coming. Let them come in and see the software; get them involved in the process; and let them know what's in it for them. Have them try it out and test it. It's about trying to be an open book to them."

Sulik noted that during Sachse's ERP process, the team identified end users' biggest pain points and worked to show how the new software could address them.

"For example, if a dumpster invoice came into the old system, you had to write a change order, issue the change order, wait for it to be approved and sent back. It was just this cumbersome process—all for a simple dumpster. It could happen five times a week on a job. There was a lot of paperwork tied up around that," Sulik said.

"We showed how, in the new system, the invoice simply gets routed to me as the project manager, I code it to the right job or phase code, approve it, and it's done. If we can show them how their day-to-day tasks are going to improve with the new system, that's a big part of getting folks on board."

Wright said keeping team members continually informed, demonstrating how their jobs can continue to get easier through technology, and training them to use all of the features and functionalities available to them to maximize the technology investment is critical to success.

"People often think, 'We're going to do this implementation, then we're going to be done, and then we'll be back to business as usual, but that's not the case if you're doing it right,'" Wright said.

"I think of it more like a new adventure. You're now on this new trajectory of continual innovation, and it never stops. If you're going to modernize your operations, it's just the beginning. You can always find new ways to work smarter and more efficiently, as long as you keep leveraging software and technology to the reach that next level."

TIPS FOR GETTING STARTED

Wright understands that facilitating change and disrupting processes that have been in place for years, even decades, can be a challenge—one that prevents many contractors from taking the leap. Despite the initial costs and work, the return on investment and untapped opportunities a technology shift can bring are well worth it. She shared four tips for contractors who are not sure where to start:

- *Designate a technology advocate*—"You need someone who is very focused on operations software. It's not just ERP software; it's building information modeling (BIM) software, project software, etc. You need someone to focus on how to best leverage the software and see how it all can work together so that you

don't end up with more technology silos. If you're going to make the investment, you've got to make a commitment to evolving your processes and company culture as well."

- *Seek help*—"There are people out there that can help you at every step of the implementation, from evaluating software to after go-live support. So, get help. It might seem expensive, but your return on investment for this will be ten times what you're going to spend."
- *Plan accordingly*—"You need to make sure you're committing the necessary resources from your company. One person cannot successfully implement the new system. You're going to need people in various roles from all over the company to come in and really rethink and restructure how you're doing business."
- *Embrace the idea of change*—"Don't take your processes (the routines you're used to) and try to morph the new software to fit them. Instead, take the software and change your processes to use the software as it was meant to be used. If you try to change the software before you truly understand how to use it with all its features and functionalities, you're going to ruin it before you even start."

"Don't take your processes
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it was meant to be used."

"Change is hard," Wright said. "And the people that are resistant aren't just older folks that have been around in the industry forever; there are also a lot of young people who are just as resistant to change. That's why a lot of contractors don't get started down this path to transforming their operations. The industry is transforming and contractors that don't address this will soon be at a disadvantage." **CBO**

Andy Holtmann is marketing content and public relations manager with Viewpoint, based in Portland, Oregon. He has worked in the construction software arena since 2011. Previously, he netted multiple awards as a newspaper and trade media writer and editor. Contact Holtmann at andy.holtmann@viewpoint.com. Visit viewpoint.com.





The Cost of Not Keeping Up with Technology

How a cloud based enterprise resource planning solution could save your bottom line

By Ray Rebello

Construction owners must constantly evaluate the best use of their resources for benefitting customers and initiating and sustaining business growth. This system of ongoing evaluation often includes making difficult decisions while balancing the funding of equipment, people, physical expansion, different types of technology and more. As such, these critical choices are rarely easy and can make or break a company if not properly handled. There's much riding on these decisions, so they should be made thoughtfully, with specific purposes in mind and the right research to back up the choice you ultimately make.

Funding technology that is focused on improving back-office operations and providing in-depth, actionable insight across the spectrum of your business is not an easy task, but it is a no-brainer decision in today's industry. It is fundamentally important for any construction company to acquire these capabilities, as the risks

of being "penny wise and pound foolish" in this regard can have catastrophic consequences for your business. The cost of not keeping up with the innovating industry and your competitors within it can far outweigh any amount of savings hoarded through neglecting to invest in upgrades to current systems.

The construction industry as a whole doesn't have a stellar record of adopting leadership technology for internal operations. Unlike the technologies for building projects that generate revenue and seem to pay for themselves almost immediately, modern internal systems, such as advanced cloud enterprise resource planning (ERP) software solutions haven't always been at the top of the list for construction company purchases. However, they offer a far better return on investment (ROI) than you might first assume.

What are some reasons to invest in a modern software solution? Many systems currently in use are old (sometimes 20 years or more),

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making them both limiting and counterproductive for the needs of modern construction companies. Such systems are not integrated with other applications and are difficult or impossible to customize, making any attempt to generate truly useful reports an exercise in futility. Further, these systems are not designed for today's mobility requirements, with data that is accessible only from the office.

The overarching impact of an outdated system is that it restricts your ability to make good decisions as an owner. Instead of having thorough and timely insight into operations, you are working with limited methods of obtaining and evaluating the critical information needed to maximize the business and avoid potential pitfalls. The legacy implementation can also be flawed with problems like double entries, no status drill-down capability and the total lack of meaningful visibility. It's like trying to drive a car with partially closed eyes.

A modern system is critical for efficient accounts payable processes, subcontractor handling, materials purchasing, etc. On a microlevel, this translates to proper job costing, well-conceived bidding, a true understanding of when and where money is being made or lost, and lower numbers of compounding errors. There's also the matter of time inefficiency. Using outdated software or manual processes takes up large amounts of owner and employee time and effort.

Dated technology that functions on-premises only is incredibly limiting and unable to take advantage of today's cloud-based solutions that provide companies with tremendous efficiency and flexibility. Construction business owners are fortunate to have access to construction-specific cloud and mobile functionality in the latest systems. According to a BDO Technology Outlook Survey, nearly 75 percent of chief financial officers (CFOs) named cloud computing as having the most measurable impact on their business.

The newest cloud-based systems combine project and cost management features with contracts, commitments, subcontracts, compliance, retainage and other construction industry needs. The way new technologies are obtained offer greater flexibility than ever before, minimizing costly capital expenditure in favor of subscription models where payment is spread over time and system capabilities are adjusted as required.

Based in Bonita Springs, Florida, Curran Young Construction Company is an example of a construction business that recognizes the need to improve its technology for internal operations. According to President Bruce Young, "Historically, technology and innovation are lacking in the construction industry. It's one of the last major industries that hasn't applied efficiencies."

Thankfully, with the recognition of the need for change and the gusto to start doing so, owners like Young are writing a new history for construction.

Young wants his business to be innovative by taking advantage of new sector capabilities, such as cloud ERP software, created specifically for the construction industry. Young decided to partner with Alliance Solutions Group and Acumatica Construction Edition to help Curran Young Construction Company to innovate and create efficiencies to stand out in the construction market. "In the past, many

people successfully worked on grit alone, but it now requires the right technology," said Young. The most critical considerations when evaluating new technology are determining if it integrates and "talks" with other software in the company and whether or not its reporting tools can be customized to distribute information throughout different levels of the organization. "It needs to be intuitive," Young said.

"We aren't accountants, so we need to navigate and understand our accounting software. It shouldn't take six clicks to get things done, but rather, everything should be at your fingertips. Flow and accessibility are essential." These sentiments should resonate with other construction business owners who are too busy keeping an eye on customer needs, and an array of other requirements, to deal with software packages that don't provide proper ease of use.

Capabilities like building information modeling (BIM), virtual reality (VR), thermal imaging, 3D printing, engineered living materials, remote surveillance and drones are technologies that also contribute much to the construction industry. When it comes to technology spending, construction business owners have a vast array of options, across many sectors, including those addressing internal operations.

Cloud-based systems for internal operations should be approached and revered as fundamental to the soundness of a business in the same way that a foundation is to the integrity of a building. While technologies like augmented reality certainly come with more frills and thrills than internal-systems technologies do, they are no more integral to your business's success—an important thing to keep in mind as a contractor considering how to allocate finite resources within an industry of infinite possibilities. **CBO**

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Ray Rebello, PE, is director of product marketing at Acumatica, a rapid-growth cloud enterprise resource planning (ERP) company based in Seattle, Washington. Visit acumatica.com.





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Accelerating Adoption in 2019

3 areas of construction tech launching the industry forward

By Pete Schermerhorn

After decades of lagging technical adoption, the construction industry is working hard to forge a new digital identity. Over the last 2 years, a combination of internal and external forces has driven contractors to experiment with and embrace technology like never before, including increased demand spurred by a growing population and skilled labor shortage. Following this period of examination, the coming year will see contractors focusing on the most effective ways to implement technology and leverage data analytics across their organizations.

A TRANSFORMING INDUSTRY

The journey to digitization is not without challenges. This year, as technology adoption and innovation in the industry moved from a few early adopters to the growing majority, it became clear that not all tech strategies and solutions are created equal. It also became apparent that technological transformation isn't only about the products, but the people and processes as well. When new data sets or tools are implemented, organizational change must follow.

While some technologies solely streamline or digitize existing processes, internet-of-things (IoT)-based technologies create entirely new processes and data sets. The question for construction companies then becomes how to best prepare for and manage change while ensuring that new tech solutions deliver results and create real value for their organizations.

Over the last year, construction business owners and solutions providers have begun to wrestle with finding the right answer to this question. The valuable lessons learned provide a roadmap for the next 12 months. As a result, in 2019 construction business owners can expect to see an increased focus in the following areas.

1. INTERNAL PROCESSES & INFRASTRUCTURE

Record investment in construction technology companies over the last 7 years has given rise to an emerging construction technology ecosystem comprised of wearable devices, sensors and drones. These devices collect and transmit real-time location, activity and utilization data from workers, equipment, tools and the environment.

The industry's ability to leverage this new groundswell of IoT data continues to evolve. Business owners are beginning to realize the strategic value that data and technology have to offer organizations. However, in 2019, the most successful contractors will be the ones who tie technology adoption, implementation and action to defined business problems, allowing for faster arrival at a solution.

Previously, contractors might have used internal technology (IT) and/or innovation budgets to test the latest tech solutions on the market, all in hopes of developing a specific use-case and achieving great return on investment (ROI) along the way.

In 2019, contractors are expected to take a more integrated, strategic approach to technology investments. This focus will become even more important as more solutions hit the market and employees in both the field and the office grow weary and frustrated with a revolving door of promising solutions that do not deliver.

As the market matures, so too do processes and procedures, and what worked in the early days may no longer suffice. Different stakeholders, including solutions providers and industry partners, will work even closer together to identify challenges and develop concrete use-cases as they better consider how solutions will be implemented and how data will be stored, analyzed and acted upon.

For example, consider a construction company that wants to reduce the time it takes to report an injury or incident on-site. Employees from the risk management, operations and technology departments can work together to define what a successful solution would look like. By assessing a variety of solutions in the market, they can outline different use-cases, ensuring that there is enough value to justify the investment. And by trying the solution on-site and in the office, the organization is able to compare multiple data flows and reports, refining internal processes in a way that best interprets and acts on the information.

Additionally, by working with the solutions provider and bringing in other key project participants, such as the owner and insurance carrier, the contractor is able to test the limits of the solution and develop an actionable, scalable solution that evolves along with the business. This process is replicable across project sites.

2. INTEGRATED PLATFORMS & EXPERIENCES

In 2019, technical partnerships and integrations are expected to become more meaningful and actionable. Over the last year, a solution's ability to integrate with existing solutions or third-party applications transitioned from being nice to have to nonnegotiable. Companies will continue to invest in increasingly sophisticated application-programming interfaces (APIs), allowing different applications to "speak" by sending and receiving data across systems.

This focus on quality over quantity will continue with the maturation and expansion of the construction technology ecosystem. As contractors become more familiar with the IoT marketplace, a solution's ability to integrate and leverage data from different hardware or software will be a central concern. To achieve this, technical

integrations and partnerships need to step out of the conference room and into the real world.

In the coming year, the industry will see more initiatives like Oracle's Construction and Engineering Innovation Lab, which debuted in late August and enables contractors to experience both the power of IoT data and technology, as well as the interaction between various solutions and tools within a simulated worksite environment. Initiatives like this help participants evolve their own products while also enabling them to consider how that evolution will affect existing partners and integrations.

3. IMPROVED MANAGEMENT & DECISION-MAKING

In construction, like any industry, decisions often come down to time, money and scope. When evaluating jobsite technology, business owners often find themselves asking when they might see the return on their investments. The trouble with this question, however, is that it often forces contractors into a holding pattern, reluctant to change processes or invest in emerging technologies that will surely pay dividends in the long run. By focusing on recovering just 5 to 10 minutes per day, contractors can begin to unlock efficiencies and increase their bottom lines.

Next year, IoT technology will see continued growth on the jobsite, changing the project management mindset from one of monitoring results to making things happen across safety, lean, quality and other organizational initiatives. Instead of taking a more reactive, after-the-fact approach to safety, project leaders and teams will use real-time notifications and feedback for a proactive approach. For example, with a business problem and corresponding solution already identified, as well as the proper procedures in place to respond to the data, safety leaders can go straight to the location of an incident and ensure that the appropriate medical attention is received or that a hazard is controlled to minimize exposure to others.

As the industry enters a new phase of digitization and focuses on the strategic application of technology and data to solve business problems, gaining the greatest value from innovation requires construction firms to put the right processes and partnerships in place and implement daily process improvements. Realizing the potential of tomorrow requires practicing today, and by focusing on daily decision-making and site management, contractors and business owners can create value that drives further adoption of technology in the coming years. **CBO**

Pete Schermerhorn is president and chief executive officer (CEO) of Triax Technologies, a company that develops and delivers IoT solutions for the construction industry, providing real-time jobsite visibility into workers, equipment and safety on-site. Triax solutions offer increased operational efficiency, faster response to injuries and overall improved project management. Contact Schermerhorn at pete@triaxtec.com. Visit triaxtec.com.



All About the Bucket

Finding the right fit to improve productivity & profitability

BY JASON BOERGER

Buckets are one of the most commonly used attachments for compact equipment, specifically compact track loaders and skid-steer loaders. And while a bucket may seem like a one-size-fits-all attachment, there are many types to choose from, depending on your application. Working with the right bucket not only goes a long way toward meeting your daily production goals, but also eases the frustrations of your operators.

With the right loader bucket, your operators and field teams can increase project productivity and reduce operating costs. To improve the way your business works and, in turn, improve your bottom line, look for a bucket that meets your organization's needs in the following areas.

WEIGHT & CAPACITY

Prior to performing tasks like loading, carrying and stockpiling, determine the bucket weight and capacity. Calculate the average density of the material to be moved and compare that to the tipping load and lifting capacity of the loader to ensure the material can be moved safely.

If you are working with different types of materials, identify the heaviest material the bucket will handle. Pushing a machine beyond these limits can accelerate wear, affect machine durability and significantly lower your return on investment.



MATERIAL NEEDS

Bucket choices for compact track loaders and skid-steer loaders are numerous, so it's important that you understand the differences to choose a style that best meets your needs. Consider the following:

- *Dirt buckets*—A popular choice for bulk applications, traditional dirt buckets are rugged and durable, making them a good choice for digging, as well as moving dirt and rocks.
- *General-purpose buckets*—For maximum filling and material retention, the most common bucket design is general-purpose, which is ideal for light-duty grading and leveling

applications, as well as day-to-day material handling. They offer good breakout force, especially when working on general aggregates in construction and municipal applications.

- *Heavy-duty and severe-duty buckets*—For more abrasive applications, consider pairing your loader with a heavy-duty or severe-duty bucket. Typically, they are designed for heavy-duty grading and leveling, as well as moving higher-density materials in construction and industrial applications.
- *Light material buckets*—If you are looking to move larger loads with smaller densities, a snow or

light-material bucket may be an economical solution for you. Light material buckets offer higher capacities than general-purpose buckets, making them ideal for lifting mulch and similarly weighted materials—primarily snow.

- **Low-profile buckets**—A low-profile bucket is a popular choice in leveling and grading applications for its longer lip and lower back, which provide exceptional visibility of the cutting edge while performing work in tight spaces on the jobsite.
- **Rock buckets**—Great for handling sediment and debris in construction applications, the rock bucket features tines, helping to easily separate materials while the soil sifts through.
- **Specialty buckets**—If your jobsite calls for a different bucket style and design, look at specialty buckets. Many compact equipment manufacturers

make a variety of unique buckets, including rock and combination (four-in-one).

GROUND-ENGAGING TOOLS

Cutting through material is often easier with ground-engaging tools. Many manufacturers offer a vast number of interchangeable bolt-on teeth options for specific buckets. For example, weld-on teeth are offered for heavy-duty buckets, such as rock buckets, to reduce wear. Additionally, replaceable cutting edges and extra guarding can be added to buckets, protecting the equipment and promoting overall productivity.

ATTACHMENT OPTIONS

There are times when more than one bucket is necessary for your application. On most manufacturers' machines, an attachment quick-change mechanism is standard, allowing for the easy change of

buckets. While these systems can save you time, construction business owners should consider adding a powered quick-attach mechanism to their loaders as well. These mechanisms provide extra efficiency by allowing the rapid change of buckets and other non-hydraulic attachments from the comfort and security of a cab.

With the right loader bucket, your operators and field teams can increase productivity and reduce operating costs. Before selecting a bucket, consider the weight/capacity, application(s), accessories and couplers that can be used in tandem with ease. **CBO**

Jason Boerger is a marketing manager for Bobcat Company, where he has spent 5 years. During his time at Bobcat, he has held positions in the product training and marketing departments. Visit bobcat.com.



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Dissecting the Differences

5 questions for finding the scissor lift that best suits your company's needs

BY RAFAEL NUÑEZ

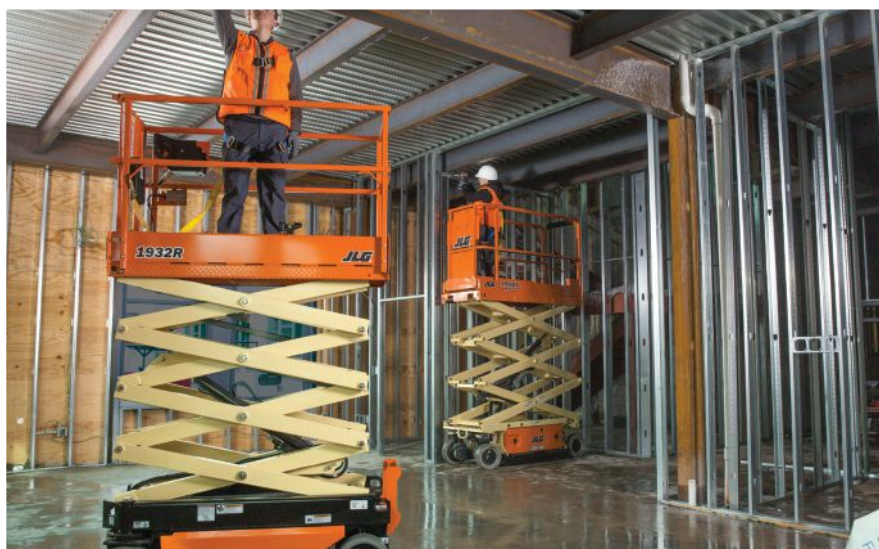
When it comes to scissor lifts, there are several factors to consider before you can decide which machine is best for your particular application. What's your budget? At what height do you need to work? Will you be working inside, outside or both? Will you have access to a power source for charging the machine? How much weight will you need to lift? What features are must-haves? The list of considerations can be virtually endless.

However, there are a handful of questions you should be certain to ask when purchasing or renting a scissor lift. Your answers to these questions will help guide you toward the right unit for the job, in terms of general specifications.

But, as with all equipment, additional features beyond height and weight differentiate one machine from another. So, while all scissor lifts may look similar, they are not the same.

Many scissor-lift models allow operators to complete one specific task, but how efficiently and safely that task is accomplished, as well as the serviceability and durability of the machine, are impacted by the model.

Add to that the advanced technologies built into the machine, and you'll quickly find there are several differentiating factors among various brands that can impact your return on investment (ROI). As such,



it is imperative that you do the necessary research and choose wisely.

1. WHAT TYPE OF DRIVE SYSTEM DOES THE MACHINE USE?

There are typically two drive systems used in powered lifts: hydraulic and electric. Hydraulic drive systems take electrical energy from the batteries and convert it to hydraulic flow. While hydraulic machines typically cost less to purchase or rent, they can be less efficient and, in turn, more expensive to operate compared to electric drive machines.

Electric drive systems have batteries directly linked to motors on the drive

wheels, making them more efficient overall. These systems require less hydraulic oil, which helps to reduce issues with oil viscosity, and renders them better suited for colder environments.

Further, electric drive lifts significantly reduce the number of leak points because they require less hoses, fittings, manifolds and other components that are critical to their hydraulic counterparts. Electric drive systems also boast increased battery life and require fewer replacement parts.

2. HOW IS THE POWER OUTPUT MANAGED?

Replacing batteries on a scissor lift can be

expensive, making it critical to have battery-management software that allows the lift to consistently operate at peak performance. While contractors often try to maximize the run time of a lift, doing so may sacrifice the long-term durability and reliability of the machine's batteries.

For example, when the battery starts to drain during a shift, the output voltage also begins to drop. The battery logic helps determine how low the voltage can drop. However, the lower the voltage drops, the more the long-term durability of the battery is compromised.

Power management is a critical ROI consideration, and equipment owners should consider working with manufacturers that offer solutions for optimizing work times and cycles while protecting the long-term battery life.

3. WHAT EQUIPMENT PROTECTION PROGRAMS ARE AVAILABLE?

Pothole-protection systems lower the ground clearance of an elevated lift to reduce the risk of an accident if the machine hits a pothole. Some equipment manufacturers pin the system to the machine's service doors, which can cause it to move in and out of alignment. Mounting the system to a stationary component, like a chassis, helps prevent alignment issues, resulting in less service and more uptime.

Additionally, many manufacturers rely on duplicate components (limit switches, plungers, etc.), which can increase the risk of system failure. Manufacturers that use one limit switch and one plunger help reduce the number of components needed to safely activate the system.

It's also important to consider what the system's limit switches can handle. Systems with lower tolerance can move the protection mechanism out of position, causing the equipment to have to be serviced.

Machines designed for high tolerance will help keep operators on the jobsite and increase productivity. These small differences in pothole protection design make a big impact on uptime.

4. WHAT TECHNOLOGIES OR INNOVATIONS COME STANDARD WITH PURCHASE?

As technology has progressed, some manufacturers have pursued solid-state electronics. A decade ago, when a machine experienced an issue, diagnostics were done through the swapping of relays and fuses until the machine's fault code disappeared. Today, improved technologies, like solid state electronics, provide multiple benefits to both end users and fleet managers.

From an end-user perspective, solid-state electronics provide operators the ability to get fault codes so that they can quickly determine the issue with a machine. This allows operators and end users to better communicate with their service team or servicing

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company to begin troubleshooting and diagnosing the problem. The next generation of technicians is anticipated to be more comfortable connecting to the machine's controller area network (CAN) bus system through a service diagnostic tool, which is essentially connecting to the "brains" of the machine.

The service diagnostic tool can be used to monitor the machine's critical components. In many cases, the machine will point a technician directly to the component or part that is experiencing the issue.

5. WHAT TYPE OF LOAD-SENSING SYSTEM DOES THE MACHINE USE?

There are two types of load-sensing systems (LSSs): force-based and pressure-based. A force-based LLS acts like a bathroom scale by providing a reading that calculates how much the pin has been compressed, showing how much weight is on the scissor lift. It provides an accurate measurement that does not need to be calibrated.

A pressure-based LSS measures pressure on the barrel side of the lift cylinder and translates that pressure reading into weight. While it costs less than force-based, pressure-based can pose a challenge in colder weather. Since hydraulic oil moves slower in colder temperatures, it is harder for the piston to push the oil out of the lift cylinder's rod-side to elevate the scissor.

This increases the pressure in the barrel, making the machine work under the assumption that it's trying to elevate a large amount of weight, when really, the sensor is giving a false reading because the oil is so viscous.

To avoid this, some manufacturers have adopted a dual-pressure sensor LSS, which places an additional sensor on the rod side to calculate the differential between the barrel-side and rod-side pressure. This reduces low-temperature error readings.

As you continue your journey to select the right scissor lift for your business, consider the process behind the design of the brand and model you are choosing. While scissor lifts appear similar, they are far from the same.

Key technologies and features that drive tangible jobsite benefits can make a big difference to your total cost of ownership and the experiences of the operator, fleet manager and technician. **CBO**

Rafael Nuñez is the product manager of scissor lifts for the Americas at JLG Industries, where he develops and executes scissor strategy, gathering customer insights and launching solutions that meet and exceed the needs of JLG customers. Prior to joining JLG, he worked with various equipment manufacturers in marketing, product training and product management. Nuñez holds a bachelor's degree in business economics from the University of Arizona. Visit jlg.com.



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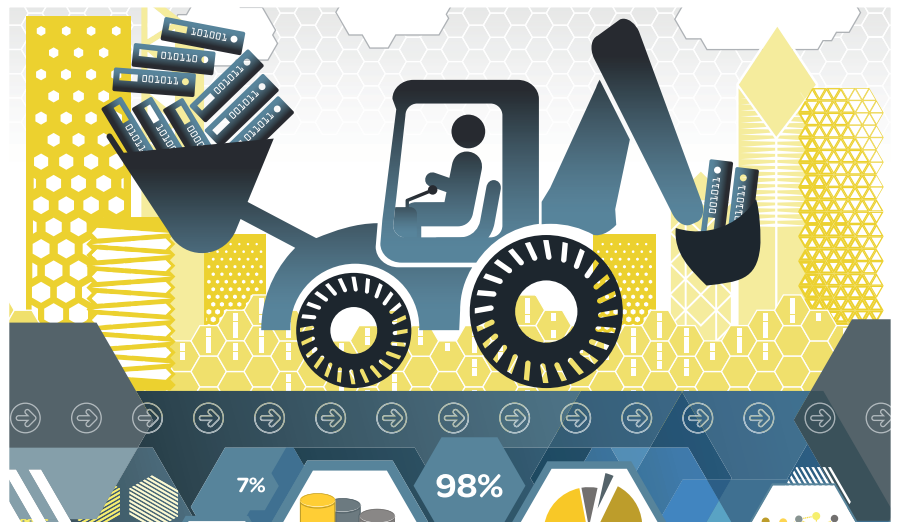
BY FRANK SCHNEIDER

According to Occupational Safety and Health Administration (OSHA) statistics, 21 percent of all worker fatalities in 2016 took place in the construction industry—a statistic that must be improved. However, improving safety records has more than the obvious benefits to human safety. Your company's safety record is also a concern when applying for new contracts. Clients prefer to work with construction companies that have a safety plan in place and maintain a good safety record. With this in mind, it's wise to include assets and equipment in your safety plan, and investing in telematics is a calculable way to do so. When your company's equipment assets are active on the jobsite, telematics data can help you monitor and react to potentially unsafe situations.

GAIN EQUIPMENT VISIBILITY

Heavy equipment tracking is a primary benefit of implementing telematics. The telematics solution dashboard can include moving assets, as well as stationary equipment, helping you manage proper utilization.

Consider a situation where a light tower is placed, either remotely or in a highly visible location, to keep the jobsite well lit. You can set alerts for specified hours of operation to ensure the light tower operates at the necessary time and does not go out at the wrong time, leaving workers in the dark.



For theft protection, the notifications also let you know if the piece of equipment is moved or if the engine is turned on when it shouldn't be. Monitoring equipment location helps manage traffic on a busy jobsite as well by allowing visibility into congested areas and equipment pieces that are operating too close to one another. When you have an immediate view of these situations, you can respond and communicate with the project manager, foreman and equipment operators instantly, potentially preventing an accident altogether.

CREATE BOUNDARIES & ALERTS

Asset telematics can do more than report the current location of an asset. Setting

up virtual boundaries or geofences allows for immediate identification of equipment moving into or out of an approved location through alerts that notify you when an asset enters or exits one of these zones. Controlling heavy-traffic areas on the jobsite in this manner offers several benefits.

First, you can set up a boundary around heavy pedestrian areas to send an alert when equipment moves into that space. Similarly, certain areas of the construction site may be unsafe for some equipment to operate in due to weight or stability issues.

Notifications could prevent an asset from getting stuck or turning over in unsafe working conditions, such as wetlands or open roadways.

IMPROVE OPERATOR BEHAVIOR

Improving jobsite safety requires ensuring that operators are trained on their equipment and encouraging the proper utilization of equipment. The information telematics solutions gather can tell your team a lot about how your equipment is being operated, guiding your training initiatives.

For example: Is the operator resorting to abrupt hydraulic usage or equipment movements? Is there excess idling or ignition turning? You can review and discuss these incidents and habits during regular safety training and upon occurrence. Some companies create incentive programs to reward the operator and/or team that has the best safety record or achieves a specified number of days without an accident.

What if an accident occurs despite all your best efforts to prevent one? The record of equipment location, movement, use and maintenance alerts can help you

conclude where safety guidelines were not followed or where processes could be improved. The data may also assist with clarifying who or what is at fault.

MAINTAIN EQUIPMENT

Properly maintained equipment is safer to operate and less likely to break down. Equipment malfunctions in the field present a safety concern, as damaged assets could injure the operator or other crew members. Even breakdowns on pieces of equipment with no known safety issues slow down project productivity.

A primary function of any telematics system is to log equipment-utilization data. Construction managers can use engine hour data to proactively schedule routine maintenance, keeping a project on track by allowing you to move equipment around or to change the punch list accordingly. Timely information like fuel, hydraulics, oil pressure

and temperature levels can help to identify equipment that is in danger of malfunctioning and should be inspected or repaired. A telematics solution also provides information on active diagnostic trouble codes (DTCs) so that you can quickly repair the issue as needed.

The data provided by your telematics solution is a valuable part of any safety plan. An accident is bound to happen at some point, but you can take steps to minimize its severity. Having solid safety practices in place, paired with the technology to carry them out effectively, means you will be prepared when one inevitably arises. **CBO**

Frank Schneider is product management director for software as a solution (SaaS) at CalAmp. Contact Schneider at fschneider@calamp.com. Visit calamp.com.



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New Products to Watch

Selected by the editors of Construction Business Owner, these new-to-the-market products are just a few of our favorites recently released to the construction community. Stay tuned in every issue to find out what you need to know about the latest gear, solutions & industry-leading innovations.



CHICAGO PNEUMATIC POWER TECHNIQUE

CPS 1800 JD8 T4F Portable Compressor

Released: 9/27/18

Availability: U.S., Canadian & European markets

What's new? FuelExpert technology reduces fuel consumption up to 10 percent at 75-percent load and can operate over 8 hours at full load

Specs: Liquid-cooled, 6-cylinder, turbocharged John Deere 525-horsepower engine with starting capacity at 14 degrees Fahrenheit; 24-gallon fuel tank; heavy-duty, tandem dual axle with 17.5-inch tires; spillage free containment frame; galvanized steel canopy that is sound attenuated

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RANGER DESIGN ▶

Max Step

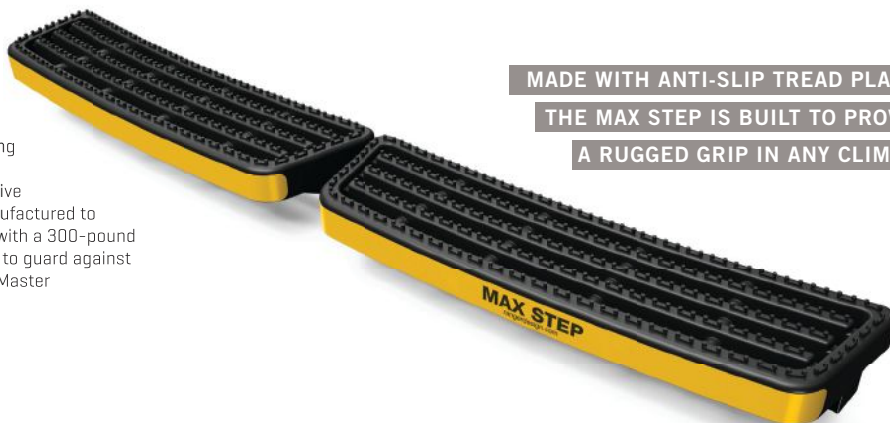
Released: 9/10/18

Availability: U.S. & Canadian markets

What's new? Easy access to van cargo space and roof rack reduces operator strain when stepping into high vehicles

Specs: Anti-slip tread for a rugged grip and reflective tape across each step for maximum visibility; manufactured to Technical Inspection Association (TUV) standards with a 300-pound weight capacity; protected by anti-corrosive finish to guard against weathering; made for the Transit, Sprinter and ProMaster

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A RUGGED GRIP IN ANY CLIMATE.



CASE CONSTRUCTION EQUIPMENT

TV450 Compact Track Loader

Released: 10/18/18

Availability: U.S. & Canadian markets

What's new? The company's largest compact track loader frame to date with 90 horsepower

Specs: 10,610-pound, vertical-lift machine with a rated operating capacity of 4,500 pounds at 50-percent tipping load; 9,188 pounds of breakout force; optional high flow of 3,450 pounds of pressure per square inch (psi) at 39.5 gallons per minute (gpm); enhanced, high-flow (4,000 psi at 35 gpm) hydraulics for high-power attachments

[Circle 211 on card.](#)



▲ EPIROC CC 2300 & CC 3100 Combi Cutter Hydraulic Attachments

Released: 9/25/18

Availability: U.S. market

What's new? Robust, multipurpose attachments offering low-noise, low-vibration operation and suitability for practically any primary demolition work

Specs: Available with two jaw versions [universal and steel-cutting] and designed for carriers in the 20- to 30-ton and 25- to 40-ton operating classes

[Circle 212 on card.](#)



▲ HILTI TE 6-A22 Cordless Rotary Hammer Drill

Released: 9/18/18

Availability: U.S. & Canadian markets

What's new? More work per charge with the B22/5.2 CPC Li-Ion industrial-class or compact-class battery; designed for weight savings, especially when working overhead

Specs: Chiseling feature for light-duty corrective chipping; TE DRS 6-A T1 dust removal system [DRS] for dust control when drilling into concrete; Hilti's 20/2/1 year warranty—20 years of repair or replacement of defective parts, 2 years of no-cost repair [including wear and tear], guaranteed 1-day turnaround on repairs

[Circle 213 on card.](#)



▲ DITCH WITCH HDD Virtual Reality Simulator

Released: 10/1/18

Availability: All global markets

What's new? Prepares operators for safe underground construction through cutting-edge training technology

Specs: Replicates what operators see and feel, using the same joysticks used on Ditch Witch drills, portable operator station, dongle, lead motion detector and virtual-reality goggles

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▼ DRAGON SCREED S-22

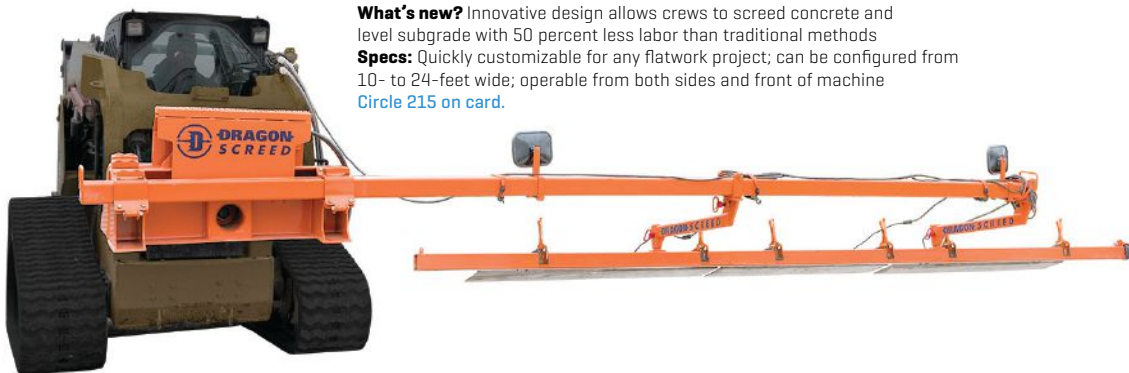
Released: 6/14/18

Availability: U.S., Canadian & Mexican markets

What's new? Innovative design allows crews to screed concrete and level subgrade with 50 percent less labor than traditional methods

Specs: Quickly customizable for any flatwork project; can be configured from 10- to 24-feet wide; operable from both sides and front of machine

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POWER2

Hybrid Energy Solutions (HES)

Released: 10/23/18

Availability: North American market

What's new? Portable power supply that integrates with diesel generators to cut maintenance and fuel costs, improve efficiency and reduce emissions

Specs: Six possible HES models with outputs from 3.7 kilo-volt-ampere (kVA) to 60 kVA; storage ranges from 7.5-kilowatt hours (kWh) to 120 kWh; silent power that is ideal for noise-sensitive applications; reduces CO2 emissions by up to 80 percent

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HYUNDAI CONSTRUCTION EQUIPMENT AMERICAS

HX220L Excavator

Released: 4/1/18

Availability: U.S. & Canadian markets

What's new? All-around view monitoring (AAVM) video camera system provides 360-degree field of vision; nine views, including industry-exclusive 3D bird's-eye view and 2D/4-channel view; intelligent moving object detection (IMOD)

Specs: Tier 4 Final-certified Cummins QSB6.7 engine, delivering 173 net horsepower [129 kilowatts] at 1,950 revolutions per minute [rpm]; operating weight of 51,500 pounds [23,360 kilograms]; standard bucket size of 1.2 cubic yards [0.92 cubic meters]; International Organization for Standardization [ISO] bucket breakout force of 37,100 pounds [16,830 kilogram-force]

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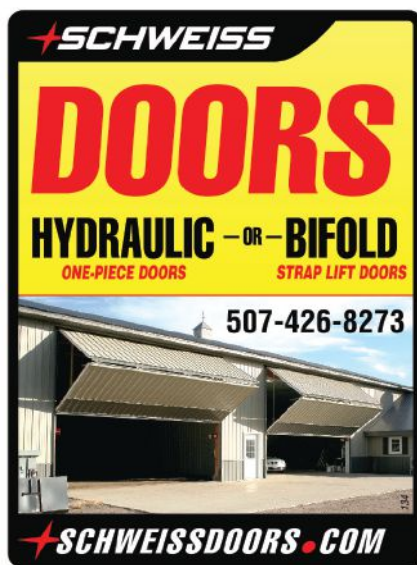
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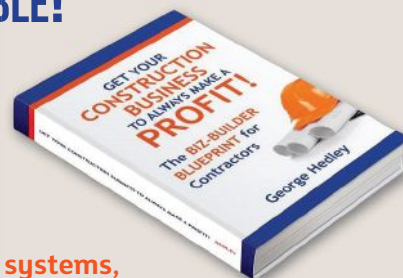
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Annual Value of Construction Put in Place

September 2016/2017/2018 Annual Rate Comparison

This chart compares the two previous years' total value of construction put in place to an annual forecast based on September 2018 figures. (Millions of dollars. Totals may not add up perfectly due to rounding.)

	2016*	2017**	Sep 18
Total Private Construction	914,271	962,008	1,020,358
Residential	470,108	525,404	556,424
Nonresidential	444,162	432,604	463,934
Total Public Construction	281,370	278,435	309,094
Residential	6,265	6,622	5,897
Nonresidential	275,105	271,813	303,197
TOTAL Construction	1,195,640	1,240,443	1,329,452

*Seasonally Adjusted Annual Rates. Source: U.S. Census Bureau

**Notice: With the May 2018 release, unadjusted data will be revised back to January 2016 and seasonally adjusted data will be revised back to January 2011. With each May release, seasonally adjusted data will now be revised for an additional 5 years beyond the revision period for unadjusted data. Research has shown that this revision span should produce more reliable seasonally adjusted time series.

\$1,329,452

SEPTEMBER 2018 TOTAL ANNUAL VALUE OF
CONSTRUCTION PUT IN PLACE

Similar to the strong conditions we've seen nationally, architecture firms located in the Midwest and Southern regions of the country continued to report very strong billings in September," said AIA Chief Economist Kermit Baker, Hon. AIA, Ph.D. "However, billings were soft at firms located in the Northeast again, where they have declined or been flat for the entire year so far."

AIA Architectural Billings Index (ABI)

National			*Regional - Billings				*Sectors - Billings			
Month	Billings	Inquiries	Northeast	Midwest	South	West	Multifamily Residential	Commercial/Industrial	Institutional	Mixed
Apr-18	52.0	56.7	50.3	49.6	51.8	55.1	50.7	52.7	52.0	50.6
May-18	52.8	59.3	50.6	50.2	55.0	51.9	52.1	53.6	54.3	47.9
Jun-18	51.3	56.0	50.2	49.8	57.4	46.9	54.6	53.4	51.6	49.3
Jul-18	50.7	60.5	48.0	49.3	55.2	49.6	54.6	50.1	51.1	48.2
Aug-18	54.2	58.0	46.9	52.5	57.0	54.2	55.6	53.6	52.3	51.7
Sep-18	51.1	58.8	46.6	59.7	54.1	53.1	54.9	50.8	55.1	53.4

For more information on the index or to subscribe to the complete historical data going back to 1995 for your internal analysis, please contact economics@aia.org. The ABI presents monthly construction billings data, using a base score of 50. A score of more than 50 indicates a growth from the previous month, and a score of less than 50 indicates a contraction from the previous month. A score of 50 indicates no change. Source: The American Institute of Architects (AIA), Architecture Billings Index (ABI).

*Regional and Sectoral indexes are three-month moving averages, due to small sample size. All data is seasonally adjusted.

**Every January, the AIA research department updates the seasonal factors used to calculate the ABI, resulting in a revision of recent ABI values.

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