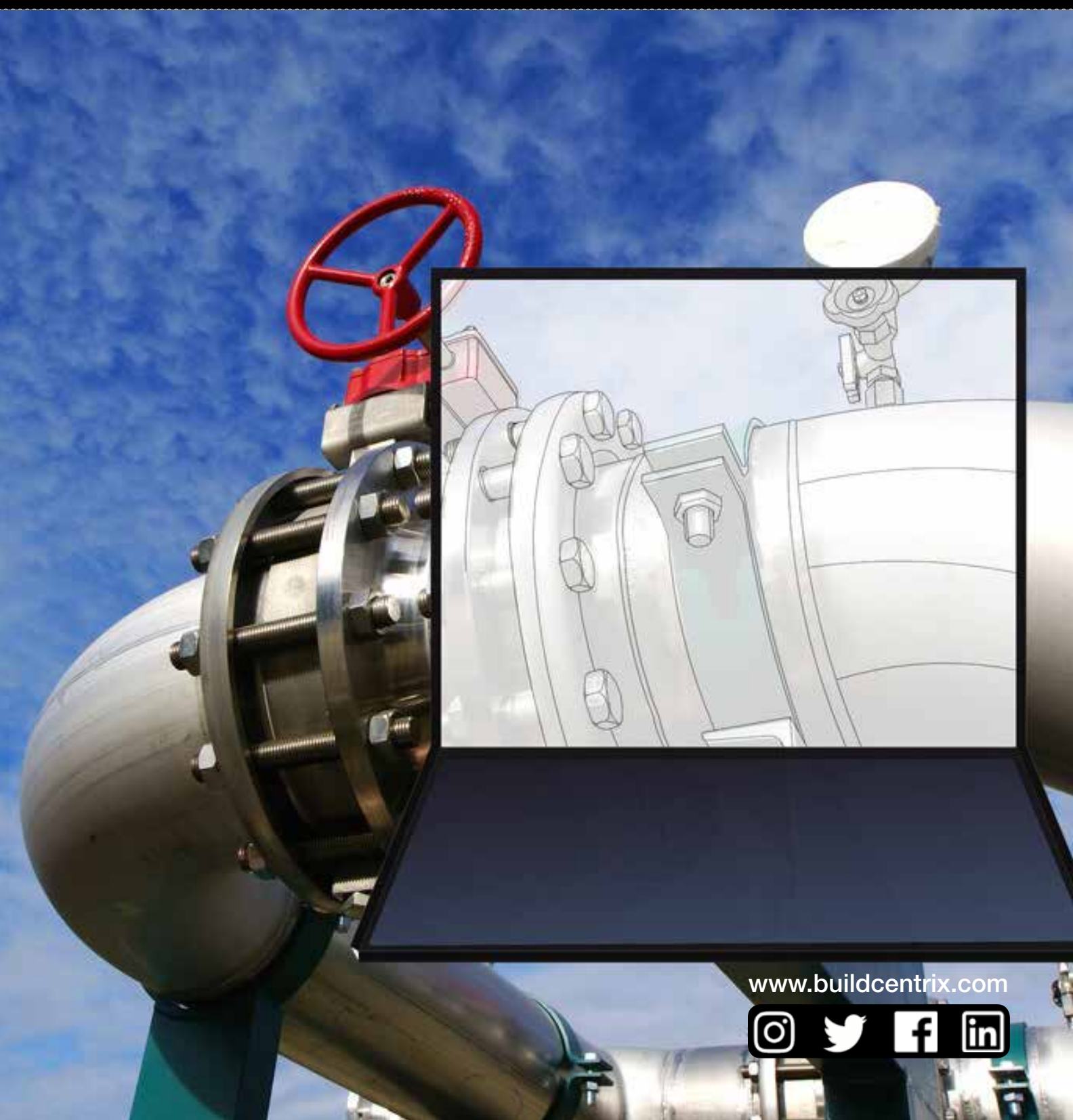


BuildCentrix

CONSTRUCTION IN THE CLOUD

September 2019



www.buildcentrix.com





BuildCentrix

In this issue we highlight the benefits contractors experience when they adopt construction technology.

In September, our team went to Seattle to attend a conference organized by the Mechanical Contractors Association of Western Washington (MCA-WW). The event showcased innovative construction technology, including wearables and virtual reality. The technology landscape is constantly changing, and the applications of this technology in construction are very promising.

Everywhere you look there are people creating and sharing new ideas that will better how we manufacture and build in safe, efficient ways. The future is bright, and as long as companies have the knowledge, confidence, and resources to evolve with the times, these businesses will flourish.

We know change is hard, but it is also exciting. Readiness to adapt to change in this ever-evolving world is no longer optional—it is what keeps us moving forward as an industry. Our goal is to assist companies in developing the knowledge and skill to maximize the benefits of technology and the data it produces.

With comprehensive data comes information that gives people the freedom to focus on what really matters: good business, attentive customer service, and a productive and efficient future for all.

Looking to keep up to date with news and information on BuildCentrix? Find us online via these social media channels:



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New technology means real-time collaboration on a whole new level of design, changes, feedback, and interaction.

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Simple, pragmatic solutions and training support facilitate adoption of new technology in the construction industry.

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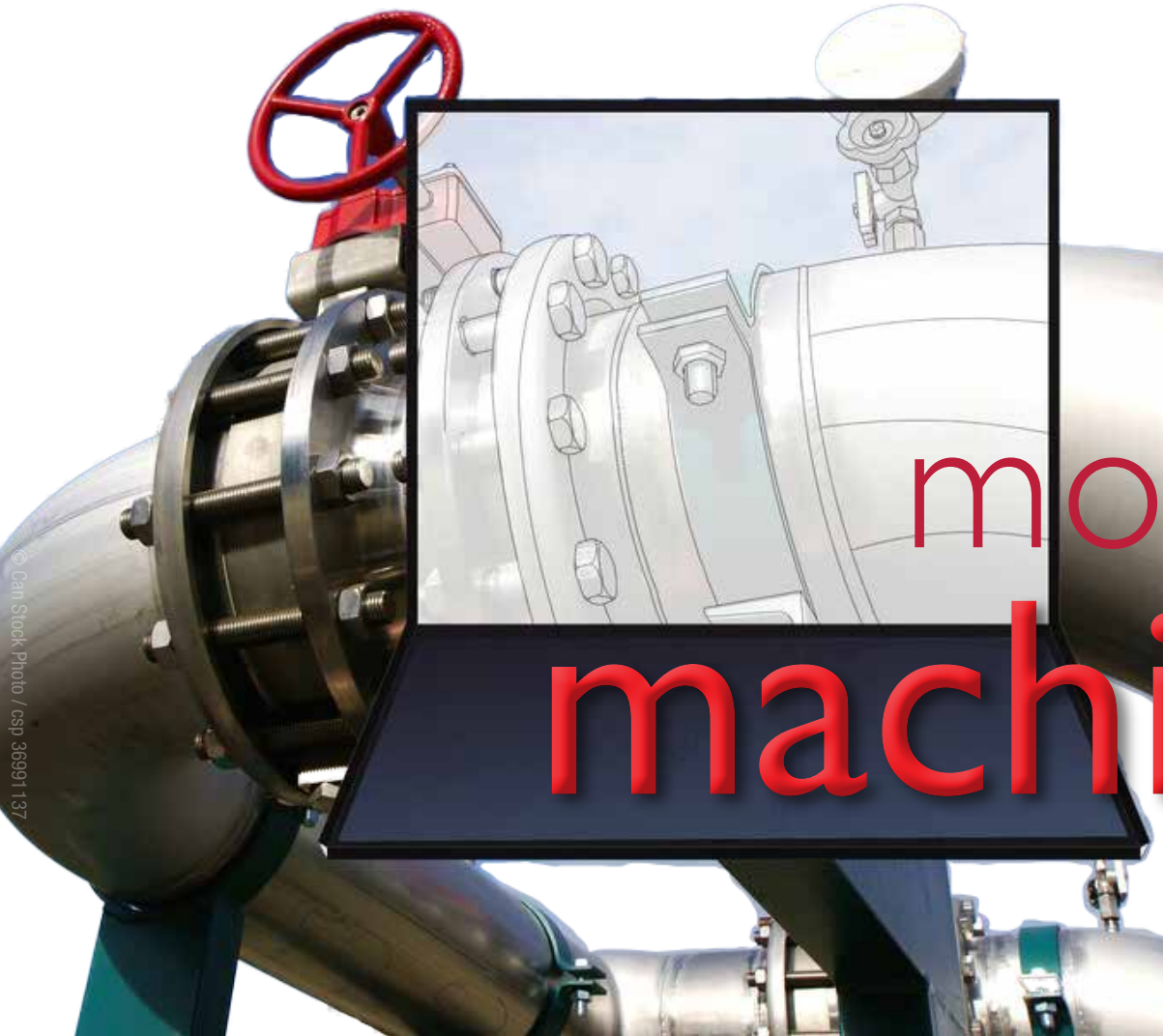
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model TO machine

Collaborative building design is firmly entrenched in the digital world, and this is where it will continue to grow and shed redundancies. As building information modeling (BIM) has grown in popularity and usefulness over the past decade, so has the proliferation of software to control the manufacturing process, and that is a positive for the industry ... until it isn't.

By **Jessia Kirby**

Up until now, manufacturing has followed a consistent process: design files are pulled from CAD and sent to programming software, which calculates the parameters of the job and generates instructions for the machine. The process is supported by intermediate software in various configurations and on various computers, generating the correct algorithms for the specific machines. In this regard, CAD/Revit (the model) and the machines are separate entities limited by the scope and ability of software and operating in a multi-user environment. This once-revolutionary technology becomes a hindrance when processes occur in isolation and the specifications of one piece of software don't quite align with another.

Technology moving forward will change all of that. Software installed on personal computers and shared in an office environment will be a thing of the past, and the model will speak directly to the machine. In intermediary processing, control and associated files will be stored in the cloud and anyone with permission will be able to access them. That means collaboration on a whole new level as design, changes, feedback, and interaction occur in real time. Redundancies are eliminated, inconsistencies are a vague memory, and timelines, productivity, and cost schedules enjoy a prosperous future.

Getting there won't be seamless, but it is coming. Model to machine is about taking the content out of the model, and being able to send it directly to the equipment on the shop floor with no re-work. Doing that requires sophisticated algorithms

to determine fabrication standards, and it requires equipment manufacturers to update how they operate—and move to the cloud.

New programming software will have to focus on how to speak to and for the machines, and the focus will have to shift to what the customers requires—Quality? Cost savings? Time control? Combined with the practical elements of the manufacturing process, the sky’s the limit. The model is brought to life and everything is connected from the architect’s vision to the manufacturing and construction process, and it’s all available to experience in real time.

The long-term benefits of owners having a digital copy of their building are plentiful, and in the new system all the changes and components of the project will be available and archived where they can be reviewed and studied to improve productivity moving forward. BIM helps building owners and operators gain efficiencies during all stages of a building’s life cycle, reduce time delays, and minimize materials waste and cost overruns.

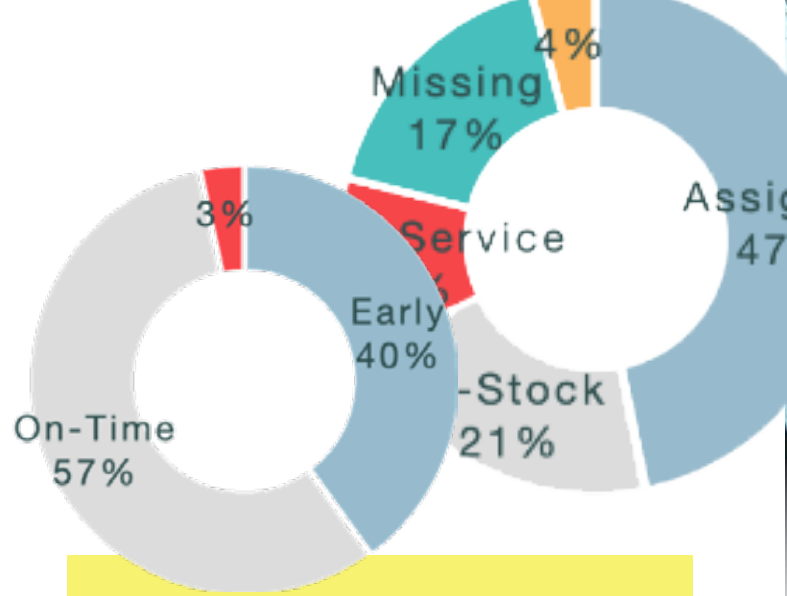
The push towards collaborative BIM has been growing every year. For mechanical contractors looking to pre-fabricate components within their shops, BIM can be leveraged to group spools or assemblies together, reducing field hours on the job site.

In the mechanical contractor’s current workflow there is a significant amount of work that happens between the model and the machine. Autodesk Forge APIs offer the ability to better harvest data out of the model and eliminate some of the redundancy in these processes. The more mechanical contractors can implement a manufacturing workflow, the more time they can save on site and in the shop by creating a standardized library of parts, getting rid of costly custom fabrication, and gaining efficiency through volume of similar parts.

This means no more CAM middleware and manually scanning or updating statuses. Rather, there should be a fabrication management tool for scheduling, tracking, and reporting, and the equipment should be able to automate how they grab and communicate with the fabrication content.

Currently, most shops are in the dark regarding fabrication from the model. Being able to accurately measure the backlog of work and see in advance of what they have next allows mechanical shops to behave like manufacturers and plan their work accordingly. Although it’s not possible to pinpoint what this will look like in exact terms, there is no doubt it is coming.

Are you ready? ■



BIM BEATS INEFFICIENCY

- Poor use of data coupled with highly fragmented teams cost the US capital facilities industry **\$15.8 billion** annually. Owners’ burden is about **2/3** of those costs during ongoing operations.
- **30%** of construction is rework and **55%** of maintenance is reactive.
- BIM reduces document errors and omissions by **61%**, rework by **36%**, and overall costs by **30%**.
- Timelines can be **22%** shorter and the possibility of litigation reduced by **17%** on projects that use BIM.
- Nearly half of building owners use BIM on at least **60%** of their projects

Source: AutoDesk



DATA ENABLED, PEOPLE POWERED

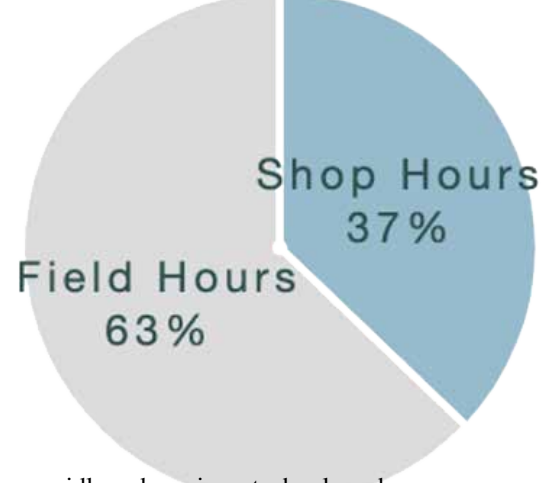
By Joe Perraton

When it comes to adopting new technology, the construction industry has always faced the unique challenge of merging the psychology of craftsmen who build and think in the real world with new technology demands and opportunities of a modern, connected world. The challenges of executing meaningful change within the trades are as steep as they are varied. Successful change requires more than just new technology solutions to reap the long-term rewards of a new way of thinking about building.

As technology advanced from paper drawing to 3D modeling, architects and designers sitting at computers pushed the frontiers of construction with little need to involve the tradespeople building their projects, since they were pretty much the only ones with computers. This created a gap between the concept of a project and those tasked with building it. In the early days of technology it was a manageable gap that slowly widened as technology advanced, but with the explosion of mobile technology, it quickly became a chasm.

Today, mobile technology is quickly closing the technical gap between the vision of a project and the actual finished product, but the gap between the digital project and the people building it has been slower to close.

Technology always advances faster than humanity's ability to change, so it's not surprising tradespeople often have an "us versus them" attitude towards those "building a project in cyberspace". While design software and technology have existed for decades, it's really only in the last decade that tradespeople have had any digital tools to work with.



So here we are in a rapidly advancing, technology-hungry construction industry, trying to get the people tasked with actually building a project to connect to the digital model of the project as they build it. There are two keys to success when getting people who haven't really used any technology as part of their work day to participate in digital construction.

EASY-TO-USE PRAGMATIC SOLUTIONS

Sure, everyone has a smartphone, probably even your oldest and grumpiest worker, but that doesn't mean adoption of new apps and online services will be easy. They use their smartphone because it's easy and the personal rewards for using it are worth the effort. Project managers and tradespeople are a pragmatic hands-on bunch, so the digital tools you give them should serve the company's need for data creation and management and provide an easily definable benefit for the tradesperson. Cutting down admin time and lessening job related stress by providing them with better, more timely job information are great benefits that lead to fast adoption. Complex technology with complex, intangible benefits can be a hard sell to the people turning a model into reality.

SUPPORT AND TRAINING

This is a big one. Support and training are no longer the "tech support" of the old days where computers crashed, mobile phones barely worked, and computer nerds were required to do support. What contractors need for training and support these days would best be described as "technology coordinators," people who teach employees to understand, use, and benefit from the new technology in their industry. Forward looking companies are now investing in ongoing technology education for their employees, which helps to accelerate adoption and increase benefits of deploying these types of cost and time saving solutions.

So what really makes great technology? Is it the razzle dazzle of faster servers, new programming concepts, faster connectivity, more and more and more data to massage and report on? Sure, that's the end game, but the real secret sauce is getting your people the technology tools, training, and information they need so they—along with the company they work for—can benefit from the new technology. ■



James Beveridge at GetTech

BUILDCENTRIX TEAM PRESENTS AT MCAWW GETTECH 2019

James Beveridge, vice-president of operations for BuildCentrix, presented at the Mechanical Contractors Association of Western Washington's GetTech event, discussing ways the mechanical construction industry and the construction industry in general are becoming more focused on manufacturing.

"There are emerging technologies that can help contractors measure and track their manufacturing productivity," Beveridge told attendees at his talk. "The presentation focused on how contractors can leverage these technologies and the benefits."

He presented numbers from the JB Knowledge 2017 construction tech survey, which said less than 20% of respondents are using Revit for BIM projects.

In 2019, that number has increased to 40%, now that more contractors are moving their processes away from AutoCAD to Revit. "The way of the future is REVIT," Beveridge said. "Client engagement is going up, and clients want to start fully implementing Revit and BuildCentrix."

By the end of the year, BuildCentrix intends to be fully integrated with Revit and offer full services for multi-trade contractors.

Check out the October 2019 issue of *Construction in the Cloud* for a full feature on James Beveridge's talk at MCA-WW. ■



TECHNOLOGY CAN TRANSFORM CONSTRUCTION

Adoption across generations is key

The Digital Transportation in the Construction Industry panel at Vancouver's Buildex tradeshow in February consisted of four innovators in construction technology who all agreed: technology is changing everything, but adoption is harder and more complicated than it looks.

Young workers tend to understand and adopt along with the company they work for—seek out, even along with the company they work for—technology without qualm, but the older generation is still unsure. Bridging the gap between the generations also means rectifying differences of opinion around this dynamic and that is key to moving forward.

"Young people are comfortable around technology, and the more seasoned generation may not be," said panel member Kris Lengieza, director of business development and marketplace at Procore Technologies. "They [do] know how to build and how to solve problems in the field. A kid out of college can run a 3D model with no problem and they're used to video games, so they're partnered with a senior superintendent who knows how to solve a plumbing clash because he's solved this problem 100 times before."

This is where the solution begins. Perhaps older workers don't want to do all the climbing around a jobsite and swinging hammers, but they have all kinds of valuable knowledge in their heads. Young workers are eager to solve problems creatively and with the use of technology.

"Once older workers get up on technology, they know it better

than anyone,” said Dave Burns, director of innovations and field applications at McCarthy Building Companies, and a panel member. He says adoption has to come from all angles and leverage everyone’s strengths.

“Try to get leadership to buy into the process and the strategy from the start,” said Burns. “That will knock down some roadblocks, but you need support from the ground up as well.”

Read more about this panel and other technology talks from Buildex at <https://www.buildexvancouver.com/en/home.html>. ■

CONSTRUCTION IS GOING DIGITAL

Technology reshaping the industry’s future

They say in times of change only the strong survive, but when it comes to the evolving construction industry it is the savvy who will survive. Those contractors who embrace innovation, are thoughtful about adoption, and who sacrifice a little vulnerability to learn something new will be the successful, thriving contractors of the future. Technology is the key, and it is here to stay.

As the momentum gathers and innovations become out-of-the-box functional in less time, the savvy contractor has to be as thoughtful as open to change. The only thing worse than refusing to adapt is adopting recklessly—here are some important and true technology trends to keep an eye on moving forward.

Data Collection and Amalgamation

The more information contractors can gather, use, analyze, and share, the further ahead they will be. Data acquisition means measurability, accountability, and overall improvement, and it also means its integration can allow machines and equipment to “talk” to and each other streamline their processes. When that happens, watch productivity soar.

Smart Technologies

Mechanical systems operated by cellphones, roadways collecting solar power to fuel cars of the future, wireless technology providing embedded electrical charge, self-healing concrete using sodium silicate—these are the technologies of the future shaping development today. The Internet of Things (IoT) is an example of this digitizing of data aggregation and analysis. Think sensors and drones and preventative monitoring—this is where efficiency begins.

Constructioneering

Constructioneering, a term Bentley Systems and Topcon use to describe how digital construction processes can be automated using integrated technology, will be the foundation of progress in this industry. Smashing silos and infusing the industry with holistic, collaborative processes, constructioneering uses surveying, engineering, modeling, and data-as-you-go to mitigate errors, increase productivity, and manage costs.

Mending the Generational Divide

There is no doubt the changing workforce will be the defining factor in the future landscape of construction. Technology can help bridge the gap between generations and increase safety, longevity, and commitment to the industry as it brings together conventional knowledge and contemporary processes. ■

VIRTUAL REALITY, ROBOTICS, AND 3D - OH MY

Is this the future of construction?

Research from Glen Dimplex Heating and Ventilation shows 75% of architects and designers are using technology to visualize projects and another 20% say they plan to start soon enough. Nearly 47% believe virtual reality will make an impact on building over the next 18 months, and almost as many see virtual reality, augmented reality, robotics, 3D printing, and drones having an important influence on construction over the next couple of years.

The study surveyed 250 architects and designers across the UK to gauge their use of technology in the design process. Technology was identified by 40% of respondents as having the biggest impact on the design process moving forward, followed by a renewed focus on fire safety (28%) and new regulations (23%).

VR is considered by some the next level of 3D modeling because it involves a detailed model that allows changes, design modifications, and sharing of data, only with VR a person can stand directly inside the virtual environment for a fully immersive experience. ■

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Photo courtesy of PSF Mechanical Inc.

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BuildCentrix is a modular multi-trade platform built specifically for integrated mechanical and HVAC contractors.

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