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 CANADA'S SUPPLY CHAIN MAGAZINE

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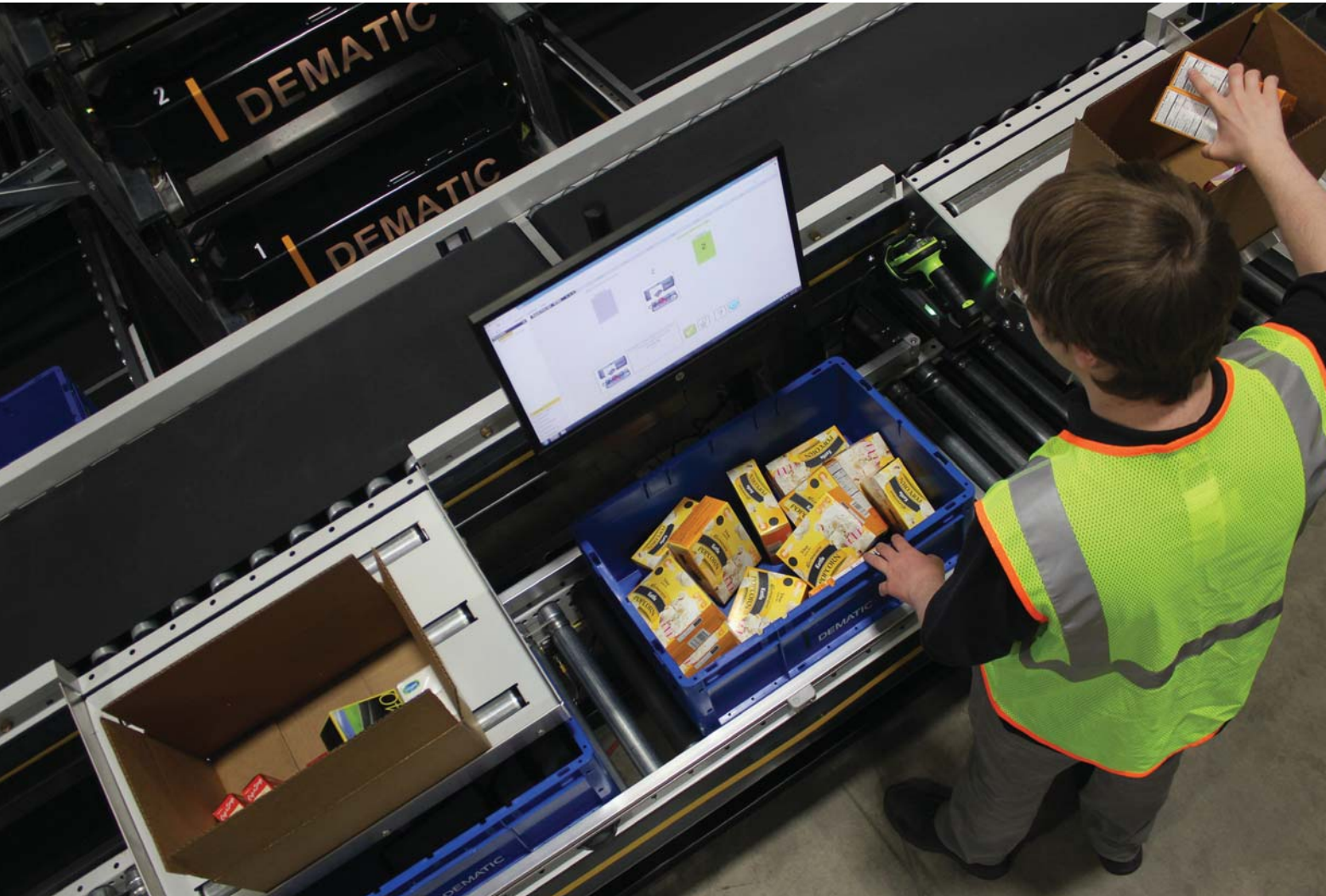


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JUNE 2018 • VOLUME 63 • NUMBER 03

CHECK OUT OUR
MOVERS & SHAKERS
SECTION
page 14

CONTENTS

In every issue:

- 5** Taking Stock
Editor's analysis
- 9** Upfront & Personal
How Jenna Brooks is building a racking empire
- 34** Supply Chain Smarts
Hydrogen in the warehouse
- 35** Learning Curve
Hazardous materials handling
- 37** Leading Edge
Everybody makes mistakes
- 38** Safety First
Making conveyors safe



24
Celebrating the bespoke forklift: Combilift at 20

ON THE COVER



The digital future of the distribution centre was on full, interactive display at the Modex material handling show in Atlanta. Find out how technologies from virtual reality to artificial intelligence will play in your future. Story on page 16.

Photo by KTSDESIGN/Science Photo Library, Getty Images

10 SUPPLY CHAIN SCAN
Overcoming barriers to the next generation supply chain; inside the MHI Annual Report.



21 Blockchain
Will it be useful for DC operations and inventory control?



29 Supersize
The complex supply chain for the Airbus A380.



33 Installations
Smart conveyors streamline cycling gear supplier.

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Canada's Supply Chain

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Thursday, May 31, 2018

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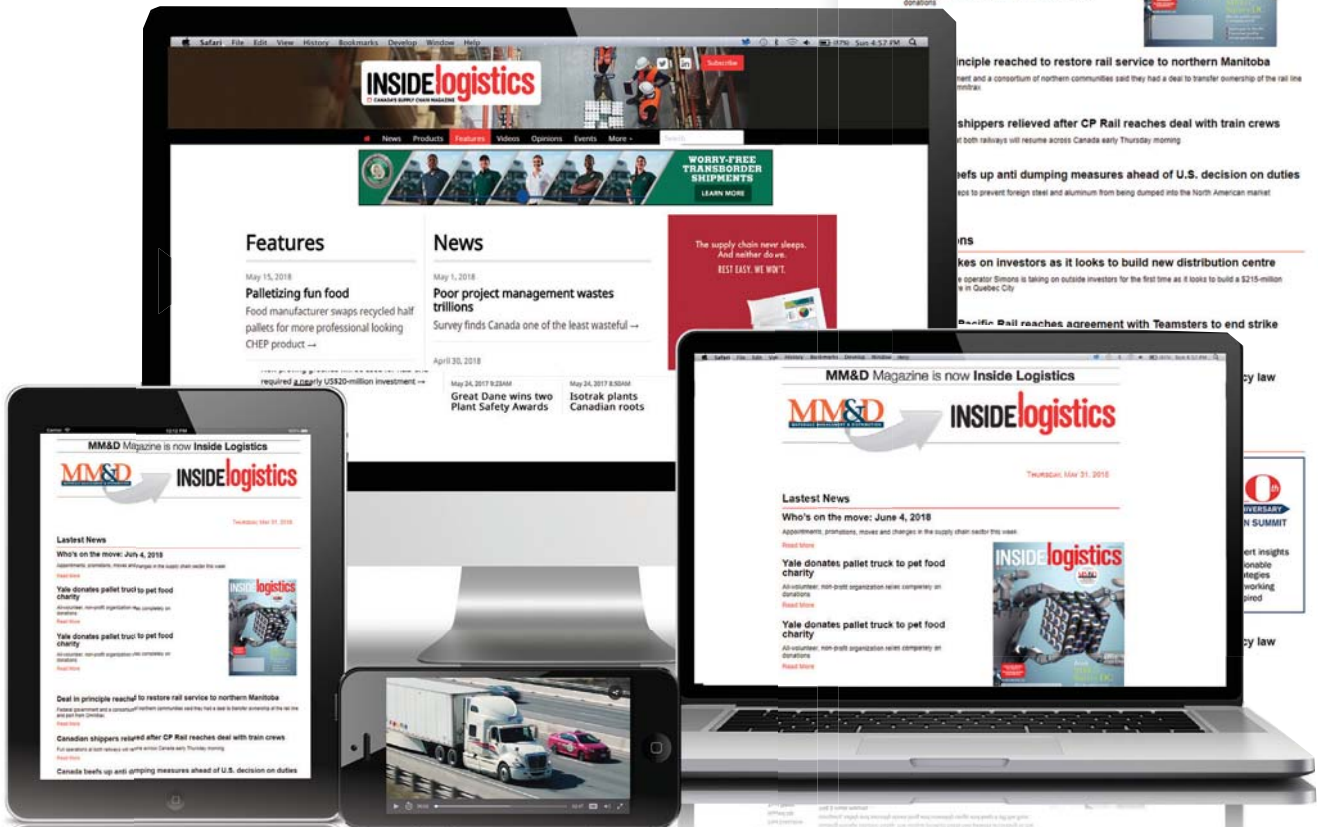
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CANADA'S SUPPLY CHAIN MAGAZINE



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Inside Logistics, established in 1956, is published six times a year by Newcom Business Media Inc.

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SUBSCRIPTION PRICE PER YEAR

Canada \$84.95 per year, Outside Canada \$159.95 US per year.
Single copy price: Canada \$15.00, Outside Canada CA\$32.65

Inside Logistics is published six times per year except for occasional combined, expanded or premium issues, which count as two subscription issues.

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PRINTED IN CANADA

Publications Mail Agreement #43008019,
ISSN: 0025-5343 (Print) ISSN: 1929-6460 (Digital).

Inside Logistics is indexed in the Canadian Magazine Index by Micromedia Limited. Back copies are available in microform from Macromedia Ltd., 158 Pearl St., Toronto, ON M5H 1L3

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Keeping up with the times

EXCITING TIMES ARE HERE. I'm really delighted to be sharing our new name and design with you at last. This project has been in the works for quite a while, taking plenty of planning, consultation and brainstorming

Our relaunch as *Inside Logistics* is timely, dovetailing with the rapidly accelerating pace of advancement in DC and warehousing technology. We are now at the forefront of a new wave of automation, with robotics, artificial intelligence, virtual reality, and more, all coming together as "Industry 4.0", the "Internet of Things", or "Supply Chain 4.0", depending where you sit.

With the environment offering so much promise, we decided it was time to bring our brand and appearance into the 21st century, and up to speed. I think we nailed it. Our new name, *Inside Logistics*, captures the essence of what we do, bringing you the inside story on the new and trending logistics processes and technologies in distribution centres and warehouses throughout Canada and around the world.

The look is clean, fresh and bold. Our design team of Catherine McKenny, Tim Norton and art director Barb Burrows all deserve huge applause for their creativity and dedication in making *Inside Logistics* an eye-catching creation.

Inside the covers we will continue to be the Canadian source for the information you need to help do your supply chain operations job cost-effectively and efficiently. With our case studies we aim to show you how your peers have successfully surmounted challenges by employing new technologies and techniques. Our regular columnists will continue to bring fresh insight into safety, leadership and professional development, while our new Upfront & Personal interview will uncover what makes a supply chain leader tick.

This rebranding was launched by former publisher Nick Krukowski, who I would like to thank for his push to innovate, and for several great years working together. All of us wish him well in his new endeavors.

To help make *Inside Logistics* even better, I'd like to invite you all to join in. We welcome your feedback, story ideas and contributions to our Supply Chain Smarts column. I can be reached at emily@newcom.ca. I really look forward to hearing your ideas!

Emily Atkins



ON PAGES 6 & 7
CHECK OUT OUR USER'S
GUIDE TO INSIDE
LOGISTICS MAGAZINE

INTRODUCING INSIDE LOGISTICS

Thank you for picking up this copy of *Inside Logistics*. We are very pleased to be introducing this new brand as part of the Newcom Media Supply Chain Group. As the successor to *MM&D* magazine's 63-year record of success, we aim to continue the tradition of great coverage of Canadian stories and newsmakers, along with global trends and influential new technologies. Please read on as we share this roadmap to what's *Inside Logistics*!



A User's Guide to Inside Logistics

What's in a name? *Inside Logistics* is designed to welcome you inside the world of distribution logistics, from the point of view of distribution centre and warehouse operations. The name says it all – we are going to give you the insider's view into these logistics operations.

The name is also a nod to the growing popularity of the term intralogistics, which is the art of optimizing, integrating, automating, and managing the logistical flow of information and material goods within the walls of a fulfillment or distribution centre.

We still cover the type of information – from inventory control to order processing, material handling and storage to dock door scheduling and supply chain integration – you counted on from *MM&D* magazine over the last 63 years. But these distribution functions have changed dramatically and we've changed along with them.

It's time to reflect that with our new brand, so welcome to *Inside Logistics*; we look forward to sharing the news, trends and experiences that are important to your life as a supply chain professional.

The future is digital.

Talk new logistics technology and the conversation usually turns to digital solutions. *Inside Logistics* will be doing our part to help you navigate the new digitized DC environment. The biggest disruptors in the world of distribution will be new digital technologies. From the virtual reality that can teach new forklift drivers, to picking technology, smart storage and artificial intelligence that helps predict inventory needs and when equipment needs to be maintained, new digital solutions are arriving on the scene almost daily. We'll help connect you to the trends and analysis you need to decide which are the right ones for your operation.

INSIDE logistics
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JUNE 2018 • VOLUME 63 • NUMBER 03

24
Celebrating the bespoke forklift: Combilift at 20

ON THE COVER
INSIDE logistics
The digital future

10 SUPPLY CHAIN SCAN
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21 Blockchain
Will it be useful for DC operations and inventory control?

29 Supersize
The complex supply chain for the Airbus A380.

33 Ins Sm stre gea

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Our web address has changed to www.insidelogistics.ca, so please update your bookmarks. All of *MM&D*'s archival content is available, along with the daily updates and twice-weekly e-newsletters you've come to rely on. We're also on Twitter (@insidelogistics) and LinkedIn (Inside Logistics). Please visit the website and sign up for an online or print subscription – it's free for qualified industry professionals.

KEY PERSONNEL

Introducing the new team at Inside Logistics:

Here's where you'll find our regular departments and expert industry columnists. In addition to our leadership (Ross Reimer – Leading Edge) and professional development (Tracy Clayson – Learning Curve) writers, we now have a new safety column each issue (Safety First) provided by a specialist author each time. The Supply Chain Smarts column offers a chance for industry leaders to share expertise with their peers. Also, Upfront & Personal will feature an interview each issue with a remarkable supply chain leader.

Our feature content will cover technology trends, operational issues, and with every issue we'll take you INSIDE a distribution centre, warehouse or supply chain operation to learn how they have adopted new best practices and technologies to optimize operations. These case studies are your chance to learn how others in the business have overcome challenges through creative problem solving and adaptation. And, we'd be happy to feature your success story – just get in touch with editor Emily Atkins (Emily@newcom.ca) to learn how.



Emily Atkins will continue to lead the editorial direction of *Inside Logistics*. Editor of *MM&D* magazine from 2002 until the name change, Atkins is well versed in the issues and challenges facing supply chain professionals. She is an award-winning writer and editor, and leverages a wide variety of international experience in editorial and journalist roles in both trade and consumer publications including *CargoNews Asia*, the *Toronto Star*, the *Arab News*, and the *Kingston Whig Standard*.



Derek Clouthier joins *Inside Logistics* as western editor. Based out of Calgary, Clouthier will report on supply chain events from Manitoba to British Columbia. An award-winning writer, Derek has over eight years of experience in journalism, with nearly three years covering the transportation industry.

***Inside Logistics* also wants to sincerely thank Nick Krukowski for his leadership as publisher of *MM&D*. Krukowski spearheaded significant adjustments to maintain the publication's leadership and relevance among Canada's supply chain professionals. Evidence of his last initiative is seen in the redesign and rebranding of *MM&D* to *Inside Logistics*. Krukowski will be missed and we wish him well in his new endeavors.**



Delon Rashid has been appointed director of business development for Newcom's Supply Chain Group, including *Inside Logistics*. Rashid joins Canada's leading supply chain publications after more than a decade with Newcom's publications serving Canada's for-hire and private trucking industry. He will be responsible for sales development across the Canadian, US and international markets for the print publications as well as their digital and video properties. Rashid is based out of Newcom's head office in Toronto.



Anthony Buttino has been appointed regional account manager for *Canadian Shipper* and *Inside Logistics* in the province in Quebec. Buttino has more than 20 years sales experience in the Canadian, US and international publishing industry. He is particularly experienced in leveraging his creativity to put together attractive multi-media packages. Fluent in French, Buttino is based out of Newcom's office in Montreal.



Lou Smyrlis, who served as editorial director of *Inside Logistics*'s sister publication, *Canadian Shipper*, from 2000 to 2013, returns to the supply chain fold as managing director of the supply chain group with responsibility for the sales, editorial and research teams.



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IN THE PINK

Racked Out's Jenna Brooks

Jenna Brooks is the CEO of Racked Out, an almost four-year-old pallet racking installation company based in Mississauga, Ontario. Here's the story of how this dynamic 25-year-old came to be installing racking and growing a business.

It's not the typical start to a business, and Jenna Brooks acknowledges that she was simply trying to earn a better wage as a maintenance worker in a warehouse facility when she started working for herself. But once she registered her business and began earning double the money, suddenly the work began to change.

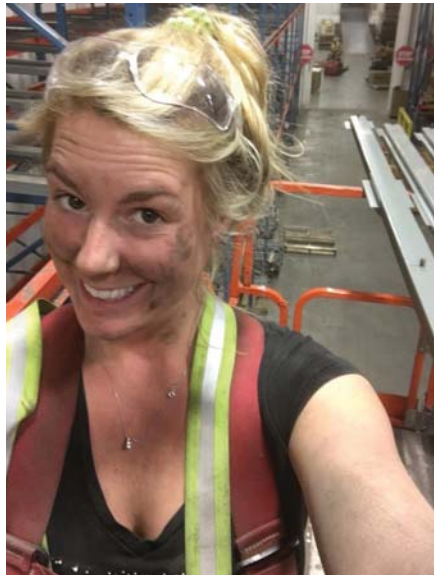
She explains how helping with a racking project led to another one, until: "I became good at it. I don't even know really what happened from there. We got one job – we went in and tore down a fence. And by word of mouth, we got another job and another job. It was just me and two people, then me and three people, and four people, and five people. And now it's three and a half years down the road with our business and we're doing big projects now with lots of people."

In fact, Racked Out employs 18 people now, and works on up to six or seven projects a week. Clients include FedEx, Menasha, and Nobel, with projects all over southern Ontario.

Behind every great woman

Brooks is quick to credit those who have been instrumental in her success. "Mentors are really key," she says. "Bill Carter [a well-known figure in Canadian material handling] is a very wonderful person; he's helped me out a lot. He looks out for me, makes sure that no one is ripping me off. He helped me develop relationships with manufacturers. He's taught us how to do so many things. He's a big part of the reason I'm here today."

She also relies heavily on her office manager Rosa Rosidale to "take care of all the stuff that I can't take care of."



"I don't know if it was because I'm a female. But I was definitely persistent. Now, being a female is giving me an edge in this industry, I'm not going to lie."



The girl card

As any small business owner knows, there are numerous challenges in getting off the ground and growing. Right now Brooks says, being taken seriously, along with buying power and staffing are her biggest hurdles.

She recalls numerous times when she's had to fight to even get a quote for rack when she's bidding on a job. We asked if being a woman is part of the challenge.

"I don't know if it was because I'm a female. But I was definitely persistent. Now, being a female is giving me an edge in this industry, I'm not going to lie. Maybe we shouldn't tell my competitors that, but at the end of the day, they're never going to have the rack that I do, because they're all men."


Brooks plays up the feminine, using hot pink as the company's branding colour. But it's not just about being a female-owned company. She supports breast cancer research and wants to become involved with helping women in the community. "We can emphasize the pink, just being strong women role models and entrepreneurs in this society," she says. And really, at work, "we don't need to be [physically] strong, because we have forklifts to do the work for us. We can do it. Women can do it."

The long game

Brooks is confident that warehousing is a good long-term prospect. "Once the warehouses are up we've got repairing, we've got maintaining, upkeep, inspections, support," she says. "There's so much more after the fact. It's not just install, walk away and wash your hands. It's the servicing part for years afterwards, the residual part."

It's a lifestyle

Brooks says she succeeds because the company is a lifestyle. "For a period of time, I am – and I have and I will – sacrificing everything in my life to be an entrepreneur. But I love it."

"I always knew I was going to be successful," she says. "I knew I never wanted to start at the bottom. I refused to start at the bottom. But even though I'm at the top of my company, I'm at the bottom of the industry. I'm very small. But you know what, I'm the future. We're the future. We're the future because all our competitors, they're older, and our manufacturers need young entrepreneurs, young installers, young sales girls to keep their company, their manufacturing facilities going strong. And I can't wait to be queen bee one day – queen of racking!" 

Customer demand, labour shortage top concerns for operations

2018 MHI report looks at barriers to tech adoption

VISIBILITY

Investments in supply chain technology have the same goal

11

ROBOTICS

Non-industrial robotics taking over the market

13

MOVERS + SHAKERS

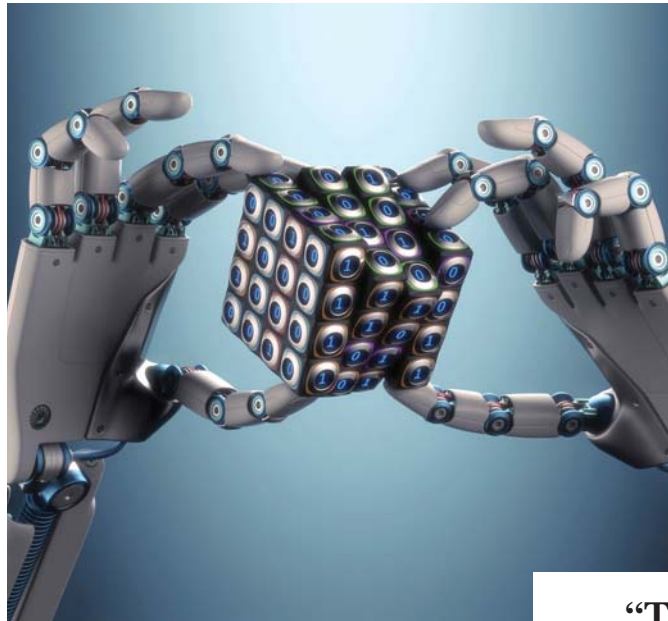
New appointments in the supply chain sector

14

ICYMI

Trending stories from our website

15



THE TOP challenges facing supply chain professionals in 2018 are increasing customer demands on supply chains and hiring talent. In a survey conducted by MHI to inform its 2018 annual industry report, “Overcoming Barriers to NextGen Supply Chain Adoption”, 73 percent of respondents cited meeting increasing customer demands, while 64 percent noted finding qualified workers as their biggest operational challenges.

In the fifth year of publication, the MHI report again looks at 11 key technologies it predicted would transform supply chain management. These technologies are working together to create next-generation supply chains that can meet these challenges because they are digital, on-demand and always on. Eight out of ten survey respondents believe these supply chains will be the predominant model within just five years.

“Today’s supply chains do much more than just physically move materials and product from place to place. In an increasingly digital world, supply chains are the backbone of an information ecosystem in which a connected and carefully coordinated set of movements and actions must be tracked at every level in order to maximize efficiency and meet customer demands for increased flexibility, visibility, and transparency,” the report says.

The key technologies will enable the always-on

supply chain are:

- Blockchain
- Robotics and automation
- Predictive analytics
- Internet of things
- Artificial intelligence
- Driverless vehicles and drones
- Wearable and mobile technology
- Inventory and network optimization
- Sensors and automatic identification
- Cloud computing and storage
- 3D printing

This year the report covers artificial intelligence and blockchain for the first time. (See page 25 for our in-depth look at how blockchain may be relevant in your operation.)

“The time is now to think big, but start small and act fast. You don’t need to invest a lot to start testing these technologies.”

– Scott Sopher

Disruption and competitive advantage

The survey respondents largely believe these technologies will be disruptive, and have the ability to confer a competitive advantage on their users.

“Early adopters are successfully combining NextGen supply chain technologies to improve speed and agility and increase efficiency and visibility,” said George Prest, CEO of MHI.

The technologies seen as offering the most disruptive potential are: robotics and automation (65 percent, up from 61 percent in 2017); predictive analytics (62 percent, up from 57 percent in 2017); the Internet of things (IoT) (59 percent, up from 55 percent in 2017); Artificial intelligence (53 percent, new category in 2018); and driverless vehicles and drones (52 percent, up from 30 percent in 2015).

What’s already in use

Of the technologies that are already being used in supply chain operations, cloud computing and storage has the highest current adoption rate at 57 percent. Adoption is expected to grow to 91 percent

over the next five years. Inventory and network optimization, now at 44 percent, is expected to reach 90 percent adoption over the next five years.

Over the same time frame, predictive analytics is expected to reach an 82 percent adoption rate, followed by IoT at 79 percent, robotics and automation at 73 percent, blockchain at 54 percent, driverless vehicles and drones at 50 percent and artificial intelligence at 47 percent.

Roadblocks to adoption

In spite of respondents' enthusiasm for the new technologies, there has been much less uptake than initially anticipated when the study was first done in 2014. The authors theorize that this is a common occurrence with disruptive new technology, as optimism at the outset is often displaced by the growing understanding of the challenges that face early adopters. The survey results "provide a useful reminder that technology transformation is extremely difficult, and that there are always challenging barriers to overcome," the report notes.

The study found the three principal barriers to new technology adoption are the ability to make the business case for its use, finding the skilled workforce – both in leadership and technical roles – to implement it, and trusting the technology and managing cyber security around it.

The talent gap is particularly troubling, as implementation requires both visionary leadership and technical skills at the highest level. According to the survey the top skills required are: strategic problem solving (49 percent), analytics/modeling/visualization (43 percent), and general business acumen and cross-functional knowledge (38 percent).

"Algorithms, automation, sensors, big data and artificial intelligence are dramatically changing what supply chain talent looks like, how to find it and retain it," added Prest.



George Prest

Scott Sopher

Making the business case

In tackling the business-case question co-author Scott Sopher, principal and leader of the global supply chain practice at Deloitte Consulting LLP, offered this advice: "The time is now to think big, but start small and act fast. You don't need to invest a lot to start testing these technologies."

The report notes it's relatively easy to justify the case for proven technology. But making the argument for unproven technology leaves a lot of room for ambiguity.

"Innovation, by its very nature, is full of open questions – especially in the early stages – and information about costs and benefits is often imperfect and speculative," it says.

As well, the authors advise planning to "leapfrog" over competitors by choosing breakthrough technology. If you choose an incremental catch-up strategy instead, you risk being left behind even after making significant investments.

The report also offers real-world case studies of NextGen supply chain technologies and recommendations for leaders for developing strategies to implement these innovations.

"While the transition to NextGen supply chains is complex, inaction is not a strategy. Ignoring these important developments may leave your supply chain at a severe disadvantage in the future," Prest added.

The findings in this report are based on survey responses from 1,100 manufacturing and supply chain industry leaders from a wide range of industries. Half of respondents hold executive-level positions such as CEO, vice-president, general manager, or department head. Participating companies range in size from small to large, with 47 percent reporting annual sales in excess of \$100 million, and 10 percent reporting annual sales of \$10 billion or more. **■**

The full report is available at www.mhi.org/publications/report.

Retailers, manufacturers investing for different reasons

Seeking the same goal: visibility

Trying to keep up with customer expectations is driving retailer investment, while agility and innovation are driving manufacturers' investment in their supply chains. The 2018 Digital Supply Chain Executive Survey found that one force, however, remains constant across both sectors: More than half identified the need for real-time product visibility as the leading driver in digital supply chain investment.

"As Amazon extends from retail into manufacturing and logistics, these industries recognize that the status quo for supply chains is no longer an option for success," said Kevin Sternecker, group vice-president, innovation strategy and solution marketing at JDA Software Inc, which jointly sponsored the survey with KPMG. "The survey outlines how retailers and manufacturers are leveraging innovative technologies and strategic

alliances to improve speed to market and deliver a superior customer experience profitably."

The survey found that both retailers (57 percent) and manufacturers (50 percent) include real-time product visibility as a top driver of investment. Retailers express the need for end-to-end traceability (53 percent) with the ability to manage new fulfillment nodes (50 percent)

continued on page 12

cent), where manufacturers are driven by the need to innovate faster (40 percent), with lower cost to serve (33 percent) through improved planning.

Predictive analytics

The study found that cognitive/predictive analytics is overwhelmingly viewed as the most disruptive technology by executives for its ability to impact all parts of the supply chain, including forecasting, fleet routing and inventory optimization. Manufacturers view blockchain and autonomous vehicles as the most disruptive technologies, with half of the companies surveyed planning to test these in the next 24 months.

“Companies that offer the best customer experiences and service have raised the bar on expectations, and now many business-to-business companies are expecting the same service levels as today’s consumers,” said Brian Higgins, U.S. supply chain practice leader at KPMG. “It should come as no surprise



that companies are investing in innovative technologies to remain relevant.”

Lack of strategy

While retailers succeed by exceeding customer expectations, the study found many are held back because they lack a clear integrated strategy. The top inhibitors for retailers include lack of management commitment (70 percent), limited IT budget (60 percent) and no integrated strategy (30 percent). In sharp contrast to retailers, manufacturers have the finan-

cial resources, but are struggling with internal decision-makers, with 57 percent citing a resistance to change as a top impediment to investment in the supply chain.

“We are all fighting for customer relevance in this age of immediacy and rapid change, and a fast, transparent and nimble supply chain sits at the core of driving relevance,” said Gaurav Pant, chief insights officer at Incisiv, which conducted the study. “Retailers and manufacturers need to focus on

reducing friction from their customer experience, which requires embracing analytics and an attitude reboot on innovation.”

Incisiv collected responses from 60 supply chain executives in the retail and manufacturing industries in February 2018 to determine the findings. Sixty-two percent of respondents are from companies that are worth more than \$1 billion, and 75 percent of respondents decide or directly influence supply chain purchase decisions. ■

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Non-industrial robots taking over market share

AGVs, drones and other supply chain bots are on the rise, study says

The robotics market continues to experience a profound and significant restructuring as the traditional industrial sector continues to shrink as an overall percentage of the total robotics market.

According to a new report from Tractica, "Robotics Market Forecasts", non-industrial robots represented 70 percent of the US\$39.3 billion robotics market globally in 2017, growing from a 64 percent share in 2016. By the end of 2018, the market intelligence firm expects that non-industrial robots will rise to 76 percent of the total market, which will have grown to \$52.7 billion by that time.

"AI technologies like deep learning, computer vision, and natural language processing (NLP) are revolutionizing autonomy capabilities in robots," says Tractica research director Aditya Kaul.

Tractica's analysis finds that most robotics industry growth is being driven by



segments like consumer, enterprise, healthcare, military, unmanned aerial vehicles (UAVs), and autonomous vehicles. A portion of this is accounted for by the rapid uptake of robotics in distribution centres and warehousing applications.

According to Kaul: "Consequences of

this shift are already beginning to play out, evidenced by recent acquisitions of industrial robotics companies by players in other sectors including consumer electronics companies." For example, industrial robot maker KUKA was recently acquired by Chinese consumer electronics manufacturer Midea.

Moreover, Kaul adds that the epicentre of robotics continues to shift from the traditional centres of Japan and Europe toward the emerging artificial intelligence (AI) hotbeds of Silicon Valley and China. China is already a powerhouse in industrial robotics with a 60 percent revenue share, however Chinese government plans put it on a trajectory to lead the market for non-industrial robots by 2025. Tractica anticipates that China will be the leading market for consumer robots, enterprise robots, and autonomous vehicles by 2025. **IL**

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MOVERS + SHAKERS



Day & Ross Inc. has promoted **Doug Tingley** to president of Day & Ross Freight. Tingley joined Day & Ross in 2013 and was most recently vice-president of operations. He will continue to represent Day & Ross on the Atlantic Provinces Trucking Association Board where he serves as vice-chair. Before joining Day & Ross, Tingley had been with McCain Foods Limited for over 15 years in various leadership roles, including vice-president, supply chain for McCain Foods (Canada), and vice-president of global procurement. He has an MBA from Queen's University and a B.A. from Saint Francis Xavier University. He continues to be based in Hartland, New Brunswick, and will report to Bill Doherty, president and CEO, Day & Ross Inc.



Duane Chiasson has joined **RF Pathways** (the WMS system of **Automation Associates Inc.**) in the lead sales role. He brings a wealth of experience. For eight years he focused on the sale of transportation and 3PL warehousing. In addition, Chiasson has held director level positions in both corporate and 3PL installations. As chair of the Toronto Area Council of the CITT, he is a valued and respected member of the supply chain community.

James (Jim) Williams has joined **Drone Delivery Canada** in the new position of director of regulatory affairs, USA. Williams will oversee regulatory compliance and coordinate with the Federal Aviation Administration at Drone Delivery USA.

Linda Fayne Levinson has joined the board of directors of Kitchener, Ontario's **Clearpath Robotics** as its first independent member. Levinson currently serves as independent lead director at Jacobs Engineering Group and is a director at NCR. Previously, she served as chair of the board of Hertz and a director of Ingram Micro and Western Union. She is on the advisory board of CVC Capital Partners, a member of the McKinsey New Ventures Advisory Council and a senior advisor to RRE Ventures. She became the first female partner of McKinsey & Company in 1978.

Jessica McDonald will be interim president and CEO of **Canada Post**. The appointment began in April 2018, following the planned departure of president and CEO, **Deepak Chopra**. The search for a permanent president and CEO is under way. McDonald was appointed chair of the Canada Post board of directors in December 2017. Most recently, she served as president and CEO of BC Hydro. Before that, she held senior positions in the B.C. government, including head of the BC Public Service.

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Michael Ducker, president and CEO of **FedEx Freight**, will retire on August 15, 2018. Ducker took the helm at FedEx Freight in 2014 after spending close to 40 years at FedEx Express. His successor will be named later. Ducker joined FedEx Express in 1975 and served in the company's frontline operations at the Memphis Hub. After rising through the ground operations ranks in the U.S. in the 1980s, he accepted his first international assignment as vice-president of southern Europe based in Milan, Italy, in 1991. He subsequently held VP positions in the South Pacific and Middle East region, and the Asia/Pacific. In 1999 he was appointed executive vice-president/president, international. In 2009, he also became COO of FedEx Express.



Hannibal Industries has named **Reed Reynolds** as its chief operations officer (COO). Reynolds has more than 14 years of experience in sales and management positions. Reynolds' tenure at California Steel Industries (CSI) began in 2006 as an inside sales representative and he quickly rose through the ranks to sales manager in 2013, making him the youngest sales manager in CSI's history. Through this experience, Reynolds has supported the growth of Hannibal Industries during his previous role and is familiar with Hannibal's organization and ESOP structure. Reynolds holds an MBA in international marketing from the University of Redlands and two undergraduate degrees in economics and business administration.

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DIGITAL DELIGHTS

Modex demonstrates the DC of the future

THE TREND to digital solutions dominated the Modex show in Atlanta this year. Displays featuring robotics, virtual reality, artificial intelligence, data analytics and Internet of Things applications prevailed and proved very popular with show goers.

The show is hosted by materials handling industry association, MHI, and takes place every other year in Atlanta, Georgia.

Modex's 110 presentations and keynotes also highlighted the digital revolution. Juan Perez spoke on UPS's efforts to anticipate tomorrow's supply chain challenges by embracing disruptive, digital innovation. MIT's Andrew McAfee echoed those sentiments in his keynote on harnessing the digital future.

During the April 11 keynote, MHI CEO George Prest and Scott Sopher, principal with Deloitte Consulting LLP's Supply Chain practice, released the findings of The 2018 MHI Annual Industry Report: Overcoming Barriers to NextGen Supply Chain Innovation during a panel discussion with 10 industry thought leaders, which we cover on page 10 of this issue of *Inside Logistics*.

Modex 2018 blew away past attendance records this year, with 25 percent more registered visitors than the previous edition of the show in 2016. Almost 31,000 people took in the massive 283,000-square-foot show floor with its 925 exhibits.

"Modex has grown not only in size, but also in overall scope. Attendees experienced a wide range of manufacturing, supply chain and transportation equipment and systems solutions and education," said Prest.

Award winners

At the show MHI also announced the winners of several prizes, including the 2018 MHI Innovation Awards. These awards serve to educate and provide valuable insights on the latest manufacturing and supply chain innovative products and services. The Raymond Corp. won Best New Product for its Raymond Virtual Reality Simulator (see below for more details).

Elokon GmbH won the Best Innovation of an Existing Product prize for its ELOshield - Proximity Detection System; and Eagle Eye Yard Management Software won Best IT Innovation for its Yard Management Solutions.

In addition to the MHI Innovation Awards, the MHI Young Professionals Network (YPN) honoured recipients with its annual awards. James Radous from UniCarriers Americas was awarded the 2018 MHI YPN Mentor Award and Brian Neuwirth from UNEX Manufacturing was awarded the 2018 MHI YPN Outstanding Young Professionals Award.

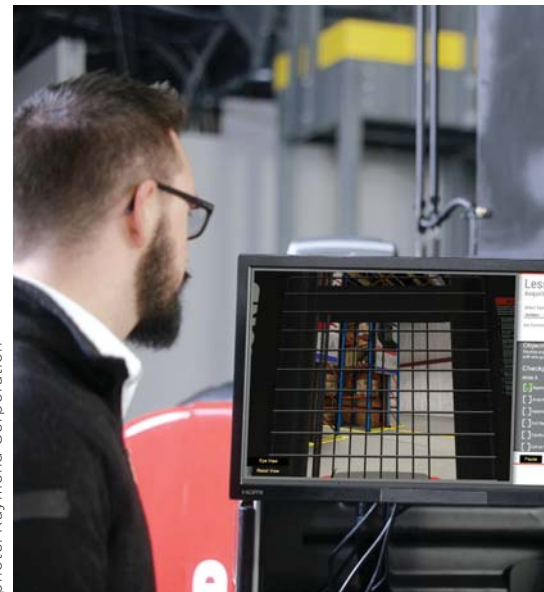


photo: Raymond Corporation

VR forklift training can simulate a wide variety of environments and situations without putting student or trainer at risk.

Show floor highlights

» VIRTUAL REALITY

There was plenty of edu-tainment on the show floor, with numerous booths offering the chance to try VR technology as it applies to various warehouse operations. We got to 'drive' the award-winning Raymond Virtual Reality Simulator through a forklift beginner's handling course. The system delivers near complete immersion, and even though the simulation took place right on the noisy show floor with dozens of onlookers, it was extremely realistic. On screen, pedestrians pop up and behave erratically, looming racking requires good control skills



Robotic picking is coming into its own. Collaborative solutions set a record at the show.

to avoid, and when you lift the operator platform it actually feels as though you are right up at the top of the racks. While some users noted vertigo from the VR, this operator was completely happy and only stepped down because there was a lineup!

The simulator is the first of its kind to allow an operator to enter a simulated warehousing environment using an existing Raymond forklift. The system plugs into the company's patent-pending Simulation Port. Once an instruction session is done, the port is disconnected, and the forklift can go back into operation in the warehouse. Using existing assets in a warehouse or distribution centre's fleet means you can avoid buying and storing purpose-built training trucks.

Over at the Hyster booth visitors put their forklift simulator through the paces, while at Dematic guests were able to try a 3D DC design system.

Robotics, virtual reality and artificial intelligence-based smart software were the hot tickets at this year's Modex show. Digital supply chain solutions are taking over the DC and forcing operations managers to take notice.

ROBOTICS

Alongside the VR, robotics applications were the co-stars at the show this year.

Automated picking displays demonstrated robots' ability to work alongside humans or alone in an e-commerce order fulfillment environment, an application that is attracting the attention of many high-volume DC operators.

A team of automation partners set a world record at Modex, robotically picking and placing 131,072 items over the duration of the event. RightHand Robotics's RightPick workcells were demonstrated in five exhibitor booths, showcasing how robotic piece-picking speeds up e-commerce fulfillment and intralogistics solutions.

continued on page 18



photos: Emily Atkins

Kardex Remstar's Chelsea Tarr (left) emphasized how the company's remote support platform engages with the physical technology. Cimcorp's Rick Trigatti (right) says he hopes predictive maintenance will help customers solve their own problems.

"We wanted to set a benchmark for piece-picking performance, and the show was a fantastic opportunity for it. We are grateful to our partners: Euro-sort, Vecna Robotics, White Systems, and Universal Robots for helping us establish this record," said Yaro Tenzer, co-founder of RightHand Robotics.

RightHand's four deployment engineers set up multiple workcells at the show. Using robots from Universal Robots, the cells were integrated with sortation systems, automated storage and retrieval systems (AS/RS) and mobile robots at partner booths.

Depending on the workflow, the RightHand systems achieved pick rates up to 1,000 units per hour over an assortment of items, including products that they had never seen before. The record was set even as show visitors and booth staff frequently took the opportunity to disrupt the robots' operations to prove their safety in a collaborative setting.

A collaborative robot experiment spanning several booths picked more than 131,000 items during the show, demonstrating how far collaborative robotic picking technology has advanced.

The RightPick set-up handles picking individual items in a variety of workflow configurations within e-commerce order fulfillment centres, distribution centres and other warehouse environments. The system can handle tens of thousands of different items using a machine learning back end coupled with an intelligent gripper that works in concert with many available robotic arms.

Digitizing Support

Remote support, integrated support and AI-aided support for material handling systems also made the top-three list of this year's themes.

At Kardex Remstar, spokeswoman Chelsea Tarr walked us through the company's new cloud-based Remote Support platform. It continuously monitors a customer's installed AS/RS systems and will initiate maintenance remotely. The program also offers analytics to allow users access to performance data no matter where they are. "It reduces downtime and increases efficiency," Tarr said. "These new digital platforms are the future, for sure."

Cimcorp North America president Rick Trigatti talked about the importance of predictive maintenance for systems. Using digital tools allows the customer to "focus on when service will be needed," he said. "We are trying to empower our users to solve their own problems." **IL**

CANADIANS AT MODEX



GREG BRAUN of Montreal-based dock scheduling and yard management software provider C3 Solutions. Braun was happy with the level of interest that visitors expressed in C3's software.



PSI ENGINEERING's senior management team (L-R), Raif Richardson, Steve Pickfield and John Panunto. The Mississauga-based company automates order fulfillment with high-speed printing and document handling systems.



GORD SMITH and **BRIAN DAWSON** of Automation Associates, makers of RF Pathways warehouse management software were busy luring in customers with a fishy giveaway (inset) of a lure.



RICHARD KAT of Engineered Lifting Systems shared news of a partnership with Johnston Equipment and showed off a new product line, the Cascading Belt Conveyor from Gawronski (pictured). For more details: tinyurl.com/ELSmosex

BILL DENBIGH (left) and **ROBERT NEHME** of Tecsys, the Montreal-based supply chain software provider. Denbigh talked about the tough times retailers in the e-commerce space are facing, saying "they are getting murdered" as the cost of goods sold goes through the roof because order values haven't changed but the number of touches has. "They can't go to a courier," he says, "because it's too expensive, so they start their own delivery services and fail." This is what prompted Tecsys to come up with a 'courier lite' concept that allows retailers to start with delivery management and then add components as needed. The solution gets users out of the situation of being 'bad couriers', Denbigh said.





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BLOCKCHAIN 101

IS IT GOING TO HELP YOU?

Blockchain is gaining traction in logistics operations, with many organizations jumping on the bandwagon. But will it have an application for distribution operations? Does it have any use in warehousing?

The technology was invented in 2008 to securely track bitcoin crypto-currency transactions. Fast forward to 2018, and blockchain has spread into all sorts of transactions. This is no surprise, because it allows collective verification of all details relating to every transaction, providing all parties involved with “a huge degree of traceability, security and speed,” says global accounting firm Deloitte.

In the logistics realm, picture a blockchain as an ethereal ledger, one that travels along with a given widget from the factory to the truck, train or ship to the distribution centre, to the delivery truck, to the post office or store, and on to the final destination. Every time the widget changes hands, the details – date, time, parties involved and so on – are added to the ledger. As this ledger is updated, identical copies of it at all points in the supply chain (the blocks in this distributed ledger chain) are also updated. All parties are aware of updates as they occur, and have to sign-off on (or at least can closely scrutinize) changes requested by any party to past updates.

What it can do

In the supply chain blockchains can be applied to any multi-step transaction, enabling not only traceability and secure information handling, but also ease of vendor management, loss prevention and more. “The supply chain is a notable use case where blockchain can be leveraged to manage and sign contracts and audit product provenance,” states Deloitte. It adds that “as the digital and physical worlds converge, the practical applications of blockchain will only grow.”

Gavin Parnell, director of consultancy Go Supply Chain,

continued on page 22

suggests blockchain may confer four advantages in supply chain transactions: more accurate and faster tracking of both products and the distribution assets that handle them; reduced errors on trade-related documentation; real-time information sharing about process improvements; and, a permanent audit trail that will reduce opening for fraudulent activity.

Blockchain's arrival is timely, as logis-

tics is becoming more complex and crowded, with less end-to-end visibility and more issues arising with accountability and auditing, says Michela Menting, digital security research director at ABI Research. Blockchain helps solve these issues, she says, through its ability to automatically organize and store necessary paperwork.

"Letters of credit, billing information, delivery routes – this information can

be coded into smart contracts and then used to trigger actions and include new participants (banks, delivery firms and so on) later down the line," she explains.

Security and visibility

Blockchain's ultimate overall value rests in the security and visibility it provides to shippers and manufacturers. "With so many companies involved in the manufacturing, warehousing and transportation process, fraud is always a possibility," says Kristi Montgomery, Kenco Logistics's vice-president of innovation. "There are currently no standards or regulations for blockchain in the supply chain, and logistics competitors need assurances that a standard is in place to protect their intellectual property. Blockchain has potential to allow for increased security throughout all touch points in the supply chain, but the industry needs to be able to move forward with a cohesive understanding of, first, a set of standards for implementation, and second, the necessity for transparency and collaboration that comes along with blockchain."

That's why Kenco Logistics has joined the Blockchain in Transport Alliance (BiTA), a forum with the goals of developing blockchain standards, educating the market on blockchain applications and encouraging its use. In late March, Purolator also joined BiTA, stating that it did so because, as a leader in the Canadian logistics market, it wants to help shape the future of the sector.

"The applications for blockchain are endless and will provide the shipping and logistics industry with never-seen-before benefits," Ricardo Costa, Purolator's vice-president and chief information officer stated at the time. Purolator wants to see how blockchain can help it improve shipment visibility, agility and delivery speed, as well as provide assistance in exploring opportunities to globalize its products and services.

Inventory control

Montgomery notes blockchain may be able to minimize redundancy in inventory control. "By centralizing data on the products [a blockchain] is tracking, less time can be spent ensuring each product is accounted for," she explains.



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“It will also allow for more global visibility to real-time status of inventory across multiple providers throughout the entire supply chain process.”

Stefan Kukman, CEO of blockchain solutions-provider CargoX, points to another inventory-related use. Once inventory is below a threshold (calculated automatically based on average usage in previous months, for example, perhaps also including periodic/seasonal factors), a blockchain contract can automatically initiate new orders through appropriate vendors and enable automatic payment in due course.

“The beauty of smart contracts is their extensibility and programmability,” he says. “For example, importers or other businesses could automate ordering to

take into account price fluctuation on the producer’s side, and order when a product is in low demand and is cheaper, for example.

Third-party logistics providers could be selected automatically, depending on pre-selected factors like route, speed, price, or mode of transport.”

Smart contracts

Similarly, Kukman says truckers and others can be included automatically in blockchain systems once their services are required via Internet-enabled devices to share cargo location and other critical

information. He adds that “by the time blockchain is widely adopted, we will have made many improvements in AI and

autonomous driving... This has huge implications in terms of driving down costs and finding instant optimizations in a complex system where human operator input alone isn’t sufficient.”

Montgomery says blockchain also could provide inventory control

in terms of traceable performance histories of suppliers (measured against chosen metrics), better compliance with regulations such as electronic logging, and true control tower visibility for shippers.

Although blockchain is poised to provide many benefits, Kukman believes its large-scale realization within the supply chain will take some time, occurring only when a regulatory framework exists to support it. In his view, blockchain will mostly be used in the near-term to optimize internal or unregulated processes in small parts of the supply chain. “We’ll see private transactions first,” he predicts, “with Customs agencies and other government bodies signing on later in the game. Later on, as adoption picks up and consensus builds around blockchain standards, we will see this technology expand into all parts of the supply chain, including handling of financial flows and on-chain settlements, and more complex end-to-end solutions.” **IL**

The applications for blockchain are endless and will provide the shipping and logistics industry with never-seen-before benefits.”

—Ricardo Costa, Purolator

HOW TO KNOW IF BLOCKCHAIN MAY WORK FOR YOU

In the 2018 MHI Annual Industry Report (for more detailed reporting, see page 10), blockchain is cited as one of the technologies that may enable the next generation of supply chain innovation. The report finds that blockchain’s main benefits will likely be in providing security and visibility to transactions. What’s slowing down its adoption is lack of understand of its potential, so the first step is to gain a thorough understanding of the technology and its applications. The report suggests conducting a capability assessment that includes asking some of the following questions to determine if blockchain is worthy of consideration in your operation:

- Can you identify a specific use case that could drive profit?
- Would having more upstream and downstream data allow you to modify strategy and improve processes?
- Would being able to increase trust along the supply chain improve operations, boost the bottom line, or reduce costs?
- Are competitors using blockchain in a way that might make sense for you?
- Could it be applied to projects that are already underway? Could it supercede them?

CELEBRATING THE BESPOKE FORKLIFT

Combilift marks 20 years of innovation

Annahagh, Monaghan, Ireland – At the end of April, Irish forklift manufacturer Combilift celebrated its 20th anniversary in business and the grand opening of a new production facility. The event was marked by a massive celebration, including supply chain media from the many countries around the world where they sell their product. *Inside Logistics* was delighted to accept the invitation to see Combilift’s new home and meet with managing director Martin McVicar to learn about the company’s plans.

» Mass customization

McVicar was clear about the manufacturer’s focus: “Mass customization is the new frontier for both the customer and the manufacturer,” he said. “Increasingly, customers are expecting products to be tailored to meet their needs...Combilift is setting the benchmark by offering the mass production of tailored products...We evolve with our clients, producing new products each year.”

In producing “bespoke” forklifts, the company works closely with customers in the design of machine and the warehouse it operates in alike. “We’re not interested in developing regular forklift trucks that have to compete with Toyota, Mitsubishi, Nissan, etc.,” McVicar said. “So, in the segments we



Main: The factory, situated on 100 acres of land, includes 500,000 square feet of production space. Inset: Combilift founders Robert Moffett (left) and Martin McVicar celebrating 20 years of success.



enter, we want to become the number one player in that market segment within a five- or 10-year period, maximum.”

The venue for this mass-custom production is Combilift’s new 500,000-square-foot, light-filled factory situated on 100 acres outside the small town of Monaghan, Ireland. Processes on the shop floor are entirely manual, which McVicar says will allow flexibility to produce the high volume of customized forklifts their customers are seeking. In fact, the set-up will allow Combilift to double production to meet future demand.

» How it started

Founders McVicar and Robert Moffett (now technical director) established the company in 1998, building the world’s first multidirectional all-wheel drive internal-combustion engine forklift. In its first year of operation, Combilift produced 18 units, 17 of which were exported. There’s a Canadian connection: One of Combilift’s first customers was Toronto-based building products supplier Lansing Buildall, which bought a unit in 1999. To this day

Combilift exports 98 percent of its production to 85 countries around the world.

The founders saw a niche market for long-load handling and for the first 10 years, the company focused on this market, selling to lumberyards, pipe manufacturers and the construction industry. The Combilift truck’s ability to essentially turn around the load instead of turning the load around the truck meant long products could be carried lower to the ground, and not lifted over people, machinery and other product in the yard.

“The Combilift multi-directional forklift revolutionized the handling of long materials as it allowed customers to handle long products in less space more safely,” McVicar said.

» Building the niche

Over the first 10 years, the company developed this niche, launching one or two new products a year. But in 2008, with the economic downturn, the construction industry went quiet. This was the catalyst for the company to look for new markets, McVicar noted. As e-commerce was in its

early stages, they saw the need to make better use of warehouse space and turned their sights to indoor forklift products.

Between 2008 and 2018 Combilift diversified its product range by developing products for the warehousing and heavy handling markets. For warehouses and distribution centres the company first built the Aisle-Master articulated truck that is designed to operate in a very-narrow-aisle environment.

In the past five years Combilift has gone deeper into this market, designing pedestrian forklift trucks with the introduction of the Combi-WR (walkie-reach truck) and Combi-CS (counterbalanced stacker). These trucks may be used in a 72-inch aisle as the operator and the controls can pivot to the machine’s side, allowing it to fill the aisle. Combilift has patented what it calls the “multi-positional operator tiller arm” technology that allows the pivot.

In the heavy-handling market Combilift builds the Straddle Carrier (Combi-SC), along with a variety of massive custom machines for unique applications. These are monsters with capacities up to 100,000kg, and many are remote-control enabled. They are all custom-designed, and are used to move items like wind turbine blades, aircraft engines and concrete tanks.

Most recently – at the anniversary event – the company introduced new members of the family, an order picker for long loads, and a high capacity powered pallet truck that can handle loads of 3,000 and 6,000 kg with higher capacities available on request.

» Export markets

The company has more than doubled in the last five years and now has 40,000 machines in operation in over 85 countries. Last year it produced 5,000, 1,200 of which were exported to Canada and the U.S. More than 12,000 Combilift machines are operating in Canadian and American businesses, McVicar said.

While Americans are very gung-ho from the outset, “our Canadian clients are a bit more cautious in terms of new products, but I have to say when you win a Canadian client, you win them for life,” he noted.

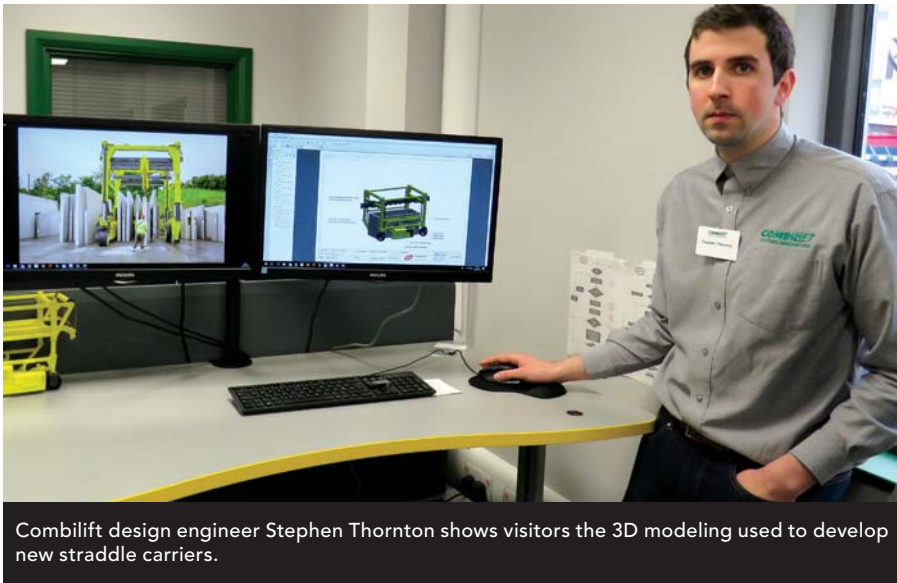
“It’s for the simple reason that it’s a

continued on page 26

“Mass customization is the new frontier for both the customer and the manufacturer... We evolve with our clients.”

– Martin McVicar





Combilift design engineer Stephen Thornton shows visitors the 3D modeling used to develop new straddle carriers.

forklift that goes sideways, and it's very easy for operators to understand," said Paul Short, the company's North America president. We have "a lot of operator acceptance, it's so versatile, and has so many uses for big-box merchants, it's a great tool for them to use all over."

Another advantage is the ease of maintenance. Although the company has a parts depot in South Carolina, you don't need exclusively Combilift parts to keep operations moving. "A lot of our major components are available in North America, so all of our hydraulic hose lines, either they're standard so a customer anywhere in Canada can go to a local hydraulics shop, can get a hydraulic hose line made," McVicar said. "A competent car mechanic can repair a Combilift anywhere, it doesn't matter where in Canada, even in the most Northern territories."

He points out that the company deliberately intends to keep it simple, but innovative, without relying extensively on complex electronics.

Combilift is counting on continued growth from our side of the pond. The aim is for sales of 1,600 units this year, a 30 percent bump from 2017, but McVicar notes they have already surpassed 36 percent growth year to date. He's confident it will continue apace.

One fly in the ointment could be the Brexit. But McVicar's not outwardly worried. Although there's a "high probability" of tariffs and import and export duties, the WTO tariff rating on forklift trucks is 4.5 percent. When you crunch the num-

bers, with the average client getting an ROI in 24 to 36 months, "even with that tariff of 4.5 percent, we don't believe it's going to have a major impact on our business going to the UK, but it's going to mean our UK clients are going to be paying 4.5 percent more," he said. "We're going to have to deal with it when it happens, because I think none of us knows exactly what's going to happen there either."

Inside the factory

The new 46,500 square-metre purpose-built factory has 11 acres of roof space, making it one of the largest manufacturing operations under one single roof in the Republic of Ireland. Everything about it is carefully designed and looking to the future, from the shape, to the ability to reconfigure sections to accommodate growth.

McVicar explained the logic of the L-shaped design (see aerial photo). "Most production plants you see across the world, the best are the rectangular shape. The reason we developed in an L shape, [was] we wanted the administration block to be in the center of the L, so that for design engineers to go to any part of the shop floor people don't have to walk so far."

In the main stores area, where parts are held, the roof is peaked and well clear of the 40-foot racking. When asked why, tour guide Graham Moffett, normally a Middle East sales rep for the company, explained that when it comes time to grow the main stores will be moved to portable storage adjacent to the new building, and the

current storage area will be converted to production. In the meantime, however, the warehousing section of the factory has 2,600 pallet positions, and a vertical carousel to manage smaller items.

They serve both the production line and repair orders from this location, with 92 percent of outside parts orders filled the same day. A part will be pulled from the production line to get an existing customer's truck up and running faster, Moffett said.

Incorporating the latest manufacturing processes with a focus on sustainability, the new factory will enable Combilift to double its output in a single shift across all production lines. Four 90-metre moving



Graham Moffett shows the ID sheet that is affixed to each machine as it goes through the production line. It shows all the specifics of each machine's unique build.

assembly lines produce a finished truck every 15 minutes. Each line specializes in a type of truck. Every truck gets about 11 hours of testing, and they correct, on average, five or six defects per truck.

The company spent 16 months developing its own water-based paint, to reduce the overall VOC (volatile organic chemicals) emissions. According to Moffett, fully 11 percent of the factory is dedicated to R&D.

Thirty percent of its roof space is covered in skylights, enabling staff to work in natural daylight without the assistance of artificial lighting. LED lights with individual motion sensors are at the ready when it's gloomy outside. Solar panels supply 185 kW of energy, while a 1 MW Biomass plant fuelled by recycled wood (pallets etc) provides heat for the painting booths and assembly area.

More than 50 truckloads of finished products are dispatched to 85 countries each week. Spare parts are also shipped across the world from Monaghan to the dealer network.

The new headquarters and manufacturing facility have been awarded ISO 9001 international quality management system, ISO 14001 Environment Management and OHSAS 18001 Occupational Health and Safety Assessment Series.

» Staffing challenges

McVicar noted that the company deliberately spends 10 percent of revenues (currently at US\$280 million) on its workforce. “If we can keep our labour content within 10 percent of that, we believe we can be competitive exporting anywhere around the world, because if we move this plant somewhere else, all we’re going to make the saving on is that 10 percent, and when you’ve expertise here, it’s not even something to consider,” he said.

And although the town of Monaghan has only 7,000 residents, with an unemployment rate of six to seven percent, the company has not needed to advertise job openings. McVicar says that being in a rural area means that many prospective employees come to the company with mechanical knowledge gained growing up on farms and working on the equipment.

Being close to the Northern Ireland border gives Combilift another concern about Brexit. With 52 staff crossing the border daily from Northern Ireland, “when the Brexit vote took place in June 2016, our biggest concern was employees, that there’s no big inconvenience at a border crossing,” McVicar said. Fortunately an agreement was reached late last year that will prevent a hard, physical border on the island.

“It gives our employees great comfort that there’s not going to be inconvenience getting to and from work. And, because as our business continues to grow and scale, if you draw a circle of where we are, we are going to be recruiting more people from northern Ireland, so we’re comfortable that there’s a solution there,” he added.

Since they began work on the new factory in 2015 the company has added 230 positions, and now employs 550. This



An assembly line worker installs door handles on a truck by hand.

“We offer the 3D warehouse design service free of charge because we’re confident that our product’s going to bring our customers value”

– Martin McVicar

number includes 50 staff in North America, and eight to 10 engineers solely dedicated to warehouse design – a service Combilift provides for free to customers. The rest working at HQ are skilled technicians, design engineers, logistics and supply chain specialists and mechanical and electrical mechatronics specialists.

» Collaborative design

Combilift prides itself on taking a collaborative approach to design, both of products and facilities. As noted, warehouse design is offered as a free service to clients and prospects.

“We offer the 3D warehouse design service free of charge because we’re confident that our product’s going to bring our customers value, and we’re willing to take the risk to do the drawing without an order because we believe it’s going to demonstrate to the customers the value it’s going to bring,” McVicar said. “It’s an investment we’re willing to make up front, and it’s paid off over the years for us.”

Sales staff will map and model a custom-

er’s existing facility over to a narrow-aisle design and use it to show them how much they might save by converting (a number they claim can be close to 24 percent more pallet positions.).

The company invests as much as seven percent of revenues into R&D each year. They work closely with clients to tweak existing products and blue-sky new ones.

For example, McVicar notes that the explosion of cold storage in North America is a new niche they are exploiting. “We’re very successful is in the cold store industry, because the cost of building a cold store warehouse, running it, managing it, is about three times the cost of an ambient warehouse, so we’re finding any company that’s looking to build cold store warehouses is really serious about going the Aisle-Master route.” (For an example, see our feature on the cover of the January-February 2018 issue on Ontario Refrigerated Services.)

To adapt the Aisle-Master to cold environments, Combilift engineers brought in a group of customers to modify the truck. They ended up adding heated cabins, replacing glass with a double-layered, heated, unbreakable polycarbonate, then fine-tuning the design to allow barcode scanning through the windows when they discovered the heating wires were interfering with the readers.

“Some of this might seem small, but we’re willing to go down into the detail to make it easier for the customer,” McVicar concluded. **IL**



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The Airbus A380

Building a giant

When Singapore Airlines flight SQ380 took off on Oct 25, 2007, it opened a new chapter in the history of air transport: it was the inaugural commercial Airbus A380 super-jumbo flight, connecting Singapore to Sydney, Australia.

This was the culmination of a development process that began in the early 1990s when the aircraft manufacturer started to examine developing a jumbo jet with a capacity of over 500 passengers to compete with the Boeing 747. Engineering and design on the A3XX started in 1994. The re-named Airbus A380 made its first flight on April 25th, 2005, and entered commercial service in 2007.

A bit of history

The European Airbus consortium was created in 1967 by France, Germany and Great Britain to compete against Boeing, the then-dominant force in the industry. When Great Britain pulled out in 1971,

Spain became a partner to the project and Airbus's first aircraft, the A300 passenger jet, had its inaugural flight from Toulouse, France in October 1972. By the 1990s, the competition between Airbus and Boeing created a duopoly in the jet airliner market, as Boeing bought

out competitor McDonnell Douglas in 1997 while other companies like Lockheed Martin, Convair, Fairchild, British Aerospace and Fokker, withdrew from this market. Airbus and Boeing account for 85 percent of the market today, with smaller players like Bombardier, Embraer, Tupolev and Comac sharing the balance. In October 2017, Airbus took a majority stake in Bombardier's C-Series jetliner program.

The double-deck A380 is the world's largest commercial passenger aircraft flying today. It has two full-length decks with wide-body dimensions. A typical A380 generally carries around 555 passengers in a three-class configuration and can accommodate up to 853 passengers in a single-class economy configuration. Its design range is 15,700 kilometres, cruising speed is about 900 km/h and maximum take-off weight (MTOW) is

continued on page 31

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**The Airbus A380's
inaugural flight**



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Major airframe sections for the first All Nippon Airways A380 arrive at the Airbus final assembly line in Toulouse, France. (Photo: Airbus)

569 tons. An enhanced A380, called the A380plus, with increased range and capacity but reduced fuel usage, is being developed.

A brand new supply chain

To successfully carry out this extraordinary project, Airbus had to create a completely new supply chain and build the infrastructure to manufacture these huge planes, with massive new facilities in France, Germany, Spain, Wales and England. The various parts that make up the jumbo jet are shipped by boat, barge, truck and plane to Toulouse, in South-West France, where a new facility was built for this purpose at the Blagnac airport. Airbus SAS has its corporate headquarters in Toulouse.

The final assembly and testing process takes between 10 to 12 months. An A380 has over four million parts and the plane is so big that it is built in six main pre-fabricated sections: three fuselage sections, two wings and the tailfin. Of these six major components, the first five travel by ocean and the tailfin travels by air, on one of five specially designed Airbus A300-600STs, nicknamed “Belugas”. In service since 1994, the Belugas are unique cargo aircraft designed to carry oversize pieces between Airbus manufacturing sites and their final assembly lines in Toulouse, Hamburg (Germany), Mobile (Alabama, USA) and Tianjin (China).

In order to carry the other massive components between their European

The future looks bright for the A380. Airbus does not have any real competition in this segment any more.

plants and the Toulouse Final Assembly Line, Airbus operates a fleet of three custom-made ocean-going vessels of the roll-on roll-off (RO-RO) type. No crane or lifting equipment is necessary to load or unload the components, as they are mounted on custom-made trailers that are driven on or off the vessels, to minimize the risk of damage. These three vessels carry the major pieces between Airbus facilities in France, Germany, Italy, Spain and Wales, all landing at the small port of Pauillac in south-west France, where Airbus has its own dock.

From Pauillac the parts journey 110 kilometres, up the Gironde river, then the Garonne river on one of two custom barges that make their way to the river town of Langon, a quiet village of some 6,000 inhabitants, more renowned for its white Bordeaux and Graves wines. The transit to Langon must be planned very carefully; when the barges go through the city of Bordeaux, they have very little clearance under the magnificent Pont de Pierre, the city’s oldest bridge, designed under Napoleon and built in 1810. The barges can only proceed at low tide and have a very narrow window.

In Langon the last leg of the voyage

begins, as the pieces are transferred from barges to specially designed road trailers, for haulage through the picturesque French countryside up to Toulouse, some 240 km away. That journey takes at least two days as the oversize convoy can only travel at night. And in spite of by-passes and roundabouts that have been built to improve the roads and minimize the risks, the vehicles have to proceed slowly.

When the final assembly work on the aircraft is completed in Toulouse, a key component has to be fitted: the engines. This is the last step, as the engines are usually selected by the airline that has ordered the plane. Then the final tests and, eventually, the inaugural flight can take place.

No competition

The future looks bright for the A380. Airbus does not have any real competition in this segment any more, since Boeing announced last year that it is phasing out production of the famed B747, the only other passenger jumbo jet currently in service. In January 2018, Dubai-headquartered Emirates Airline ordered 36 additional Airbus A380s, to be delivered from 2020 onwards, confirming it as the A380’s largest customer, ahead of Singapore Airlines, Lufthansa, Air France, British Airways and Qantas. The total order book for the A380 jumbo plane stands at 331 units, 226 of which have been delivered and 226 are in operation at time of writing. **IL**

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Cycling supplier gets smart conveyor



ZYROFISHER is a distributor of parts, accessories and clothing to the UK and Irish cycling markets and represents over 50 brands as well as supplying its own Altura products to retailers.

With 800-plus cartons being shipped daily, the company needed to streamline operations and increase warehouse productivity by improving the efficiency of the order fulfilment process. With high levels of manual handling dominating pick, pack and dispatch operations at the 100,000-square-foot facility, they needed a solution to make the movement of goods from the packing area to dispatch more efficient.

ZyroFisher invited Advance Automated Systems Ltd., a UK-based conveyor manufacturer to review existing handling methods. Their proposed improvements included a handling system incorporating energy-efficient 24V DC technology and components from Interroll.

Smart solutions for totes, boxes and cartons

Advance's engineers proposed a bespoke, zoned, SmartLine roller conveyor to transfer various sized cartons directly to the dispatch trailer.

The conveyor was installed because it offered the most energy efficient and economical method of delivering cartons directly to the dispatch trailer.

Built by Advance Automated Systems Ltd., SmartLine is a zero-line-pressure conveyor system incorporating 24V DC technology and includes a quiet running RollerDrive EC310 and the MultiControl from Interroll, which together simplify and reduce the system commissioning time on site.

Easy configuration

The configuration of sensor or RollerDrive properties is done over PLC software, a web user interface or with the Interroll teach-in procedure. The Interroll MultiControl can be used in

temperature ranges of between -30°C and +40°C. Plug & play technology allows for quick and easy replacement, if necessary. In case of replacement, no new addressing or configuring is required.

Automation

Advance's automation solution is flexible, modular and efficient to run. With each individual conveyor module independently driven, they only operate when there are containers present; once these have moved off, the conveyor modules no longer run, but continue to be ready

The company ships 800 cartons a day from its 100,000 square-foot facility



to transport product. If required, cartons can accumulate over the full length of the conveyor.

So as not to restrict access through the warehouse, the conveyor system was equipped with lift access gates, both single width (for pedestrian/fire escape access) and double width (for pallet access). All gates include gas springs, making them easy and safe to lift. An extensible gravity roller for loading into the back of a trailer completed the configuration.

"Being both modular and flexible in design, the Advance SmartLine zero-line-pressure conveyor was installed because it offered the most energy efficient and economical method of delivering cartons directly to the dispatch trailer, thereby streamlining ZyroFisher's workflow," said Shaun Graham, Advance Automated Systems's marketing manager. **IL**

HYDROGEN

Fuel for distribution centres

LOGISTICS PROFESSIONALS know that cost and operational efficiency are of critical importance to distribution centres, the hubs of the materials management sector. These centres generally operate 24/7/365, making any interruption potentially disruptive and costly.

Currently, one element of DC operations, the necessary fleets of forklifts, are mostly electric battery powered, because fossil fuel-powered vehicles produce fumes and pose other risks. However, they require long charge times that put them out of service, requiring larger fleets. As well, their storage batteries degrade over time, a process that has to be closely monitored, and is a maintenance headache. Costly battery replacements must be scheduled, and performed.

Hydrogen-powered forklifts are a great alternative for many distribution centre operators. Hydrogen is the most common element on our planet. In its natural form it is stable, odourless and safe. The most environmentally friendly method of producing hydrogen is through a process called hydrogen electrolysis, in which an electrical charge is applied to pure water enhanced with a catalyst in order to split the H₂O molecule into pure oxygen and hydrogen gas. The oxygen can be emitted safely to the atmosphere or captured for future use, and the hydrogen gas is the fuel of the future.

This hydrogen gas is then used in a technology called hydrogen fuel cells to produce power for immediate use. Forklifts equipped with hydrogen fuel cells generate power directly to run these critically important vehicles.

What is interesting for us is that hydrogen energy technology is very Canadian. “It was Canadians who discovered the energy potential of hydrogen as an energy carrier,” says Robert (Bob) Stasko, director of government relations for the Toronto based Hydrogen Business Council, and co-founder of Energy Storage Ontario.

“Canadian hydrogen energy pioneers,



LEON WASSER, president of Wasser Resources Inc., is a veteran green engineer, consultant and technology commercializer. He can be contacted at leon@wasserresources.com.

“Hydrogen is the ideal fuel for distribution centres because it eliminates costly charge times, battery charge monitoring, and battery disposal costs.”

like Vancouver’s Ballard Technology and GTA based Hydrogenics and Next Hydrogen, are the global leaders in applying this technology. Our Canadian hydrogen power technology is currently being exported across the globe, especially to East Asia and Western Europe, where it is being applied to trains, streetcars, buses, trucks, cars and distribution centre forklifts. I am pleased to see that that Next Hydrogen is the Canadian company leading our industry’s entry into the distribution sector forklift market.”

Mathew Fairlie, president of Next

Hydrogen, founding chair of the Hydrogen Business Council, and veteran member of Canada’s hydrogen industry says: “Operators have discovered that hydrogen is the ideal fuel for distribution centres because it eliminates costly charge times, battery charge monitoring, and battery disposal costs. Forklifts equipped with hydrogen fuel cell ‘battery-replacement units’ can be fueled in minutes, just like your car at a gas station, and can run for a full shift cleanly and safely.”

Fairlie explains that the company has already developed a complete hydrogen production and fueling system for a major Canadian distribution centre and is finalizing a second, even larger one. “Our contribution to these systems is our proprietary Hydrogen Generation technology. Our systems are housed in standard shipping containers, so they can be set up quickly and easily, anywhere that has power and water. In addition, for distribution centres that don’t want or need a hydrogen production facility on site, we are developing larger-scale hydrogen production stations that generate hydrogen centrally, which can be stored in mobile fuelers and distributed by truck to wherever the hydrogen is needed.”

As Staskow notes, “distribution centres are just the beginning of the application of hydrogen power in the freight distribution and transportation sector. As but one example, California’s Long Beach Port is currently exploring adapting their local port-based trucking fleet to hydrogen to reduce pollution and greenhouse gas (GHG) emissions in America’s largest and busiest ports, and Canadian hydrogen energy technology is essential to make this happen.”

In summary, hydrogen is an ideal fuel for distribution centres because it is economical, eliminates forklift charging downtime, eliminates the hassle and cost of forklift battery monitoring and replacement and operates cleanly and safely. It is a Canadian technology that has potential for the whole planet. **■**

HAZARDOUS MATERIALS

Everyone must commit to safe warehousing

IT MAY SOUND melodramatic or even alarmist, but there's no denying we live in a dangerous world. There are potential hazards everywhere. The dangers can be natural, such as lightning from a thunderstorm, or man made, such as car crashes caused by human error.

But humans have developed ways to keep themselves and their loved ones safe in the world. We take precautions, cut down on unnecessary risks and try our best to control situations. We align and surround ourselves with people we trust. We try to hold others to the same standard we set for ourselves. Many of us collaborate in an effort to ensure the whole community is well taken care of.

Follow the example

The way humans have adapted to living in an inherently dangerous world is the way a 4PL should also practice the proper warehousing of hazardous materials.

The good news is that a warehouse does not have to be as unpredictable as the outside world, even if you are storing chemicals that could damage the environment or seriously injure people. A warehouse is self-contained, with staff and management team members, machinery, tools, and equipment.

Everyone working in a warehouse can be kept safe, every item or piece of equipment can be accounted for and used properly, and each and every procedure can be defined, refined and improved upon.

That is the basic approach to take. You need to prioritize safety, operational controls and regulatory compliance. This sounds simple, and conceptually it is, but it involves a lot of documentation, communication and cooperation. It also requires determination and resilience.

A good safety culture comes when you get buy-in from everyone working in the warehouse. Everyone must commit to safe practices and regular and intensive safety training. Further, staff must be willing to recognize and document their errors or



TRACY CLAYSON

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near misses and to check them against industry standards by participating in regular safety audits.

"And you will get audited," says Neil Telfer, the director of distribution operations at our company. "Rather than being unpleasantly surprised, and negatively impacted by the results of an external audit, why not find out what strategies or procedures you are failing to execute well by doing your own internal audits?"

Detailed safety management

Telfer adds that to ensure good operational control you need a detailed safety management system with comprehensive operating procedures tied tightly into your internal audit program. The procedures must outline expectations, but they must also go deeper. A bad input can lead to a bad output. If Frank doesn't properly tighten a screw, something is in danger of opening unexpectedly down the line when Jane gets to it.

And then there's regulatory compliance, which includes the legislative safety requirements your organization must meet, such as OH&S, WHMIS, the Labour

Code, and national and provincial fire codes. It can also include voluntary compliance to an ISO 9000 or 14000 system, or compliance with specific industry guidelines.

Beyond these three main areas lies a wealth of other great resources. One is the Chemistry Industry Association of Canada (CIAC), which offers many services, including its Responsible Care Program. The CIAC offers extensive information, expertise and support to help companies make sure staff and management are well aware of the challenges they face as keepers of hazardous materials.

Open communication

Communicating internally definitely helps encourage successful approaches to the warehousing of hazardous materials. Smart companies go a step further, by opening lines of communication outward to the community – not because they have to, but because it can provide mutual benefits.

This can take the form of meetings with local residents or groups for discussions about anything the community wishes to discuss. Some companies invite local fire services in, to get on the same page on warehouse safety and to decide on collaborative solutions. This way, if something unexpected happens, the relationship, and some trust, will have already been established.

So, if you are a global 4PL service provider looking to warehouse hazardous material, you now have some of the high-level knowledge you'll need to begin. If you'd rather partner with someone, you can hire a firm specialized in full-service chemical product warehousing and staffing as well.

Proper warehousing of dangerous goods requires a complete commitment to safety, as well as excellent operational controls and thorough regulatory compliance. If you meet or exceed these best practices you will be making everybody's world just that little bit safer. **■**



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MISTAKES

And how we handle them

ON A RECENT TRIP I had the privilege of playing golf in Sedona, an Arizona desert town surrounded by red-rock buttes, steep canyon walls and pine forests. That particular day I was playing as a single and was matched up with three other golfers. On the first tee I was introduced to Jim, a fellow from Kansas City, and then to Bill and Jody from Boise, Idaho.

It didn't take more than a few seconds for me to realize that the gentleman from Boise was in fact Bill Buckner, formerly of the Boston Red Sox. Baseball fans will know that he's most famous for a mistake he made during the 1986 World Series.

A simple mistake

Boston was heavily favoured to beat the New York Mets when game six of the series went into extra innings. While playing first base Buckner failed to handle a softly hit ball that came towards him. Trying to rush the play because of the speed of the hitter, he let the ball roll to the left side of his glove, through his legs and into right field, allowing a base runner to score from second and win the game.

Ultimately the Red Sox went on to lose the World Series and Buckner faced enormous anger from fans and media alike. He was heckled at every ballpark thereafter and even faced death threats. His wife and children experienced vitriol from the Boston community, which ultimately led to them relocating to a ranch in Boise, Idaho, where life could carry on peacefully. And all of this because of a fielding error that every baseball player who's ever played the game could have made.

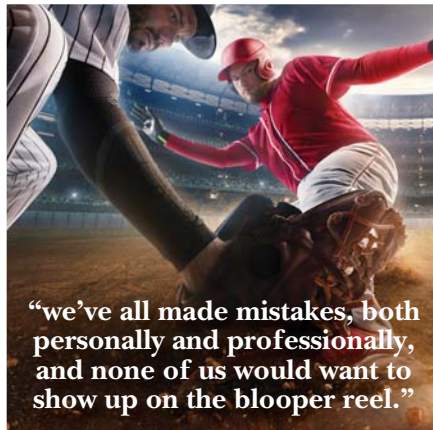
It seems we are in a place and time where people's mistakes are amplified to outrageous proportion. The sports news regularly carries the worst plays and the bloopers of the month, all of which focus on mistakes that anyone could make. The fact is we've all made mistakes, both personally and professionally, and none of us would want to show up on the blooper reel.

As leaders within our companies we have an opportunity every day to handle mis-



ROSS REIMER

has over 30 years of experience in transportation/supply chain. For the last 20 years he has been President of Reimer Associates, a recruitment firm within supply chain. rreimer@reimer.ca



“we’ve all made mistakes, both personally and professionally, and none of us would want to show up on the blooper reel.”

takes professionally and with understanding, or conversely, with an attitude that can make our employees feel like they are personally responsible for losing the game. What an opportunity for leaders to exhibit character, strength and compassion, which I believe builds the most competent and trustworthy team that any company can ultimately have.

When I think back to my early days in the transportation industry working in the warehouse and driving a truck, my personal blooper reel would have been embarrassing – particularly as part of a family business. Thankfully, I have fond

memories of great managers and supervisors along the way who used my mistakes as teachable moments and showed me the way forward early in my career.

Very few of us will have our careers defined the way Bill Buckner's was. In fact he was an accomplished player in every facet of the game, an outstanding teammate and most importantly a player who came to the field every day giving it his very best.

In the four hours I spent with Bill and his wife Jody playing golf in Sedona I got just a small taste of who they are as people. And two nicer people you couldn't meet. Married for 38 years with a great family, they were a pleasure to play golf with, chat with and enjoy a beautiful day. Both excellent golfers, they were just as interested in my playing partner and I, as we were in them. It wasn't about baseball or celebrity status, just four people in a chance meeting on a golf course having a great time together, mistakes and all.

Forgiveness

Over the years most Boston fans came to forgive Bill for his famous error. Perhaps some even realized how ridiculous their behaviour towards him really was. The Red Sox invited him back to throw the first pitch at Fenway Park several years ago. Bill told me it was important for him and his wife to head back to Fenway so they could forgive the fans for the awful treatment they received in the years following the incident. And so the world finally moved on and Bill has as well.

So the next time one of your employees makes a mistake, even a big one, remember it presents an opportunity. It's an opportunity to crush their spirit, focus on the negative and most likely poison the work environment, or to see it as a teachable moment, understanding that we all have our own blooper reel. Mistakes will happen, but it's forgiveness that makes the world a better place.

To learn Bill's story, here is a YouTube video: <http://tinyurl.com/IL-Buckner>

WORKING WITH CONVEYORS

Preventing injury through proper safeguarding

IN THEIR VARIOUS FORMS conveyors make material handling easier. Unfortunately, equipment that contributes to productivity typically also introduces hazards into the workplace.

Given the significant use of conveyors with DC processes and the close proximity of workers to the equipment, the risk of injury is often underestimated. Crushing injuries, amputations and sometimes fatalities are the result of contact with conveyor-related hazards.

Proper safeguarding practices should be in place to protect workers from the in-running nip hazards and shear points that are found at many conveyors. In many cases, injuries result during cleaning, unjamming or other maintenance activities. It is important to identify risks associated with the conveyor during its entire lifecycle.

A thorough risk assessment should focus on the tasks and hazards and determine what level of risk could result at and around a conveyor system. Safeguarding can help control these risks. Thankfully, there are many safeguarding options available and it is essential for an employer to select a solution that best fits their operation.

A common area of concern is the conveyor's main drive system. These components are often safeguarded with fixed barriers, as frequent access to this part of the system is not necessary. Fixed distance guarding – which doesn't completely enclose the hazard but reduces access based on distance from it – is another common measure.

More advanced solutions could make use of safeguarding devices such as interlocked doors, light curtains, area scanners, etc. The application of safeguarding devices requires careful consideration, including ensuring that these devices are placed at the appropriate safe distance from the hazard(s), and that they are integrated to meet an appropriate performance level as determined by a risk assessment.

When door interlocks and light curtains



MICHAEL WILSON

is a professional engineer, Canadian Registered Safety Professional and a Certified Machine Safety Expert. With over 20 years of experience, he supports machine safety solutions as a Technical Specialist for Workplace Safety and Prevention Services

“A thorough risk assessment should focus on the tasks and hazards and determine what level of risk could result at and around a conveyor system”


are applied, the hazards must cease or be controlled immediately in order for these devices to be considered effective safeguarding measures. Where the conveyor hazards do not stop instantly, guard locking should be contemplated. In this case, a movable barrier (eg. hinged access door) would be locked in a closed (safe) position until the hazard(s) are controlled or stopped. Only then would a worker be allowed to access the area.

Each part of the safeguarding system should be effective – consider using CSA Z432 (Safeguarding of Machinery) or ASME B20.1 (Safety Standard for Conveyors and Related Equipment) to support your safeguarding solutions.

Emergency stop functions are frequently applied around conveyor systems. In some cases, an emergency stop button would be placed at a workstation and, in others, an emergency stop pull-cord may run the length of a given conveyor. Where e-stops exist and, for that matter, any safeguarding device that signals a stop to the system, workers should understand what action occurs when the e-stop or safety interlocks are activated. The CSA Z432 refers to this as “span of control”. Many conveyor systems can be a considerable size so it is important that workers understand what part of the system would be affected by activating a specific safety device or e-stop.

As with any machine, maintenance will be required at some point, either planned or unplanned. When it comes to conveyor repairs, locking out the equipment is the preferred approach. Workers should have knowledge, training and experience related to the machinery. The employer should establish a lockout program, train and evaluate each worker's understanding of the lockout requirements.

On occasion, safety measures may be removed or defeated for the sake of maintenance. This practice should be prohibited. In the rare case where lockout prohibits a specific task, other hazardous energy control methods must be in place. CSA Z460 (Control of Hazardous Energy: Lockout and Other methods), CSA Z462 (Workplace Electrical Safety) as well as applicable legislation should be consulted for guidance.

Conveyor design and associated safety methodologies can become complex. The standards mentioned above can contribute to safety around conveyors. As a starting point, look at “A User's Guide to Conveyor Belt Safety” found on the WSPS website. This resource outlines common hazards, provides an overview of the risk assessment process and summarizes several safeguarding solutions. With this information you can take steps to reduce the risk associated with conveyor systems. 



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