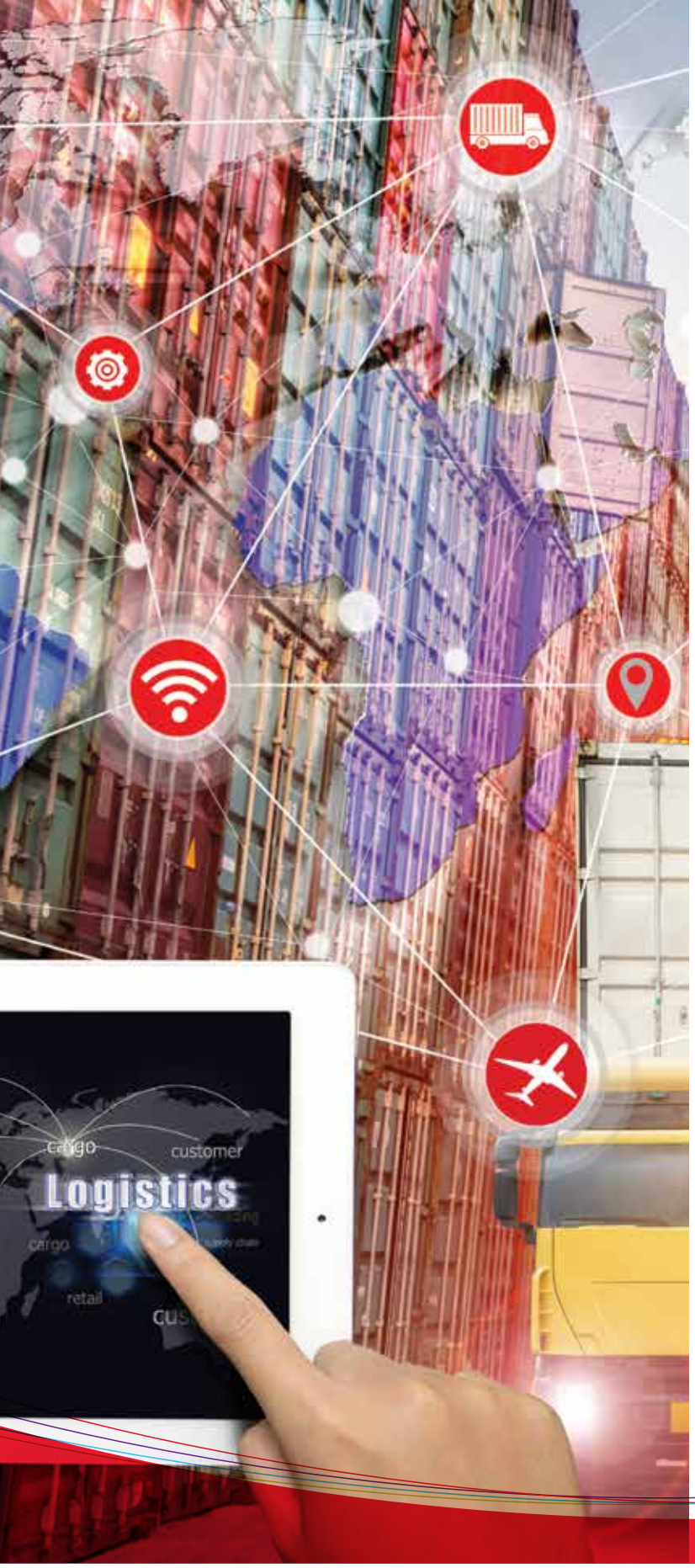
ELECTRO FEDERATION CANADA



2018 INDUSTRY RESEARCH REPORT

LET'S GET DIGITAL

A Roadmap for Digital Supply Chain Excellence in the Canadian Electrical Industry

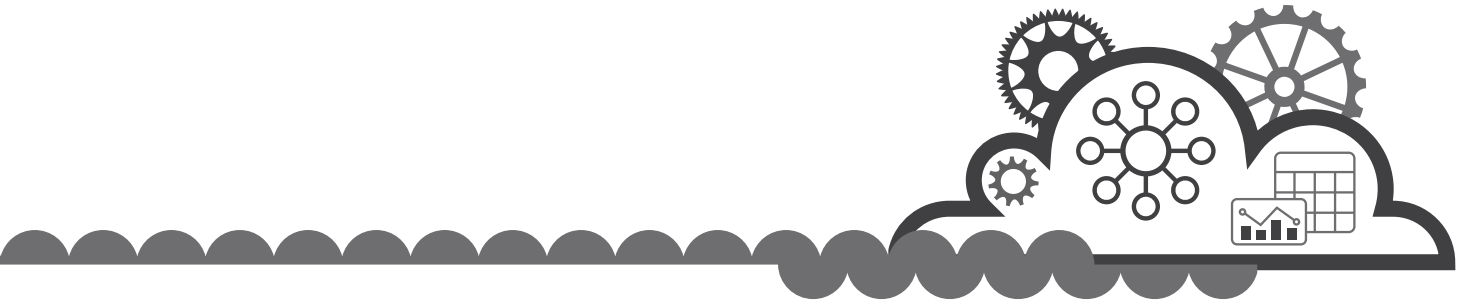
In collaboration with:

pwc

NAED NATIONAL ASSOCIATION OF ELECTRICAL DISTRIBUTORS

We have a vision for the supply chain of the future

How can digitization make the supply chain more agile, efficient, and customer-focused?



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About Electro-Federation Canada

Electro-Federation Canada (EFC) is a national, not-for-profit industry association that represents over 220 member companies that manufacture, distribute, market and sell a wide range of electrical products. EFC members contribute over $10B to the Canadian economy and employ 40,000 workers in more than 1,300 facilities across the country. EFC empowers the industry with market intelligence, professional development and a voice for advocacy and standards advancement within a safe, collaborative environment. For more information, visit www.electrofed.com.

PricewaterhouseCoopers (PwC) provides companies with assurance, tax, consulting and deals services. Drawing on the broad experience of specialists from across its global network, PwC uses its knowledge and experience to develop tailored solutions for clients, helping them build public trust and deliver the value they're looking for. For more information, visit http://www.pwc.com/ca.

ELECTRO FEDERATION CANADA EFC

1. EXECUTIVE SUMMARY

Digitalization is reaching an inflection point and your business must be prepared for the shift. Failure to transform will not be an option for too long.

Electro-Federation Canada (EFC) has developed this study in collaboration with PricewaterhouseCoopers (PwC) to provide EFC members with guidance on the value-add of digitalization[1] in the Canadian electrical industry, specifically as it relates to supply chain networks.

This study examines how digitalization can impact our industry's value chain and provides an outlook on opportunities. An overview of the industry's current digital progress is included in this report; the analysis includes the use of conventional benchmarks provided by PwC.

To draw insight from the electrical community, EFC conducted an online survey with manufacturer and distributor members, and held a focus group with EFC manufacturers' representatives. EFC also worked in tandem with Research Committee members to analyze aggregate results and discussion points.

Key findings in this research study include:

1. Digital Transformation of the supply chain is important to members

- Nearly 70% of those surveyed said the digital transformation of the supply chain is "important or very important" to their business. Three-quarters of these respondents have already formalized a digital strategy or are in the process of formalizing one within a year.
- 28% of member respondents said they do not have a strategy planned yet, but are exploring next steps; only 3% have not considered digitalization to date.

2. Service will set the industry apart from new market entrants

Members recognize the strong importance of service in the channel: 75% of survey respondents said 'heightened service levels' is the key driver for digitalization in their business. This focus on service might very well be what separates the industry from external competitive forces.

3. Digitalization progress is moderate: the industry leads — and lags—in the digitalization of core supply chain functions

- 'Planning' is the most developed area of digitalization so far; close to 70% of member survey respondents claim they are developed in this area;
- 'Transportation' is the least developed; one-quarter of manufacturer respondents have yet to move up from basic digitization in this space; distributors are one level up on manufacturers, with one-in-three beyond the second stage (*emergent*).

4. Establishing an enterprise-wide digital culture will be critical

Strengthening a company's Digital IQ will need to be a primary factor to effectively rolling out digital processes and services across the supply chain. Change management will be a crucial part of each organization's go-forward digital strategy.

5. The key to digitalization success is collaboration

Digitalization will only be successful if all value chain partners collaborate to affect change. Unlike e-Commerce and other 'e-friendly' platforms that help differentiate industry players, the digital electrical supply chain will only be as robust as the transformation of its weakest link.

6. Technological advancement is paramount

Today, many organizations employ a series of disparate systems that are not configurable with other internal or external partner platforms, resulting in siloed, fragmented information. The electrical industry lacks integrated technologies to support and streamline the supply chain. The retail market and other industries have demonstrated digital transformation success by investing in technologies that help automate the supply chain and connect functions to a single, common interface. The electrical industry will be required to modernize its infrastructure to allow the integration of platform systems which extend across the value chain, enabling all channel players to input, source and share data in real-time.

These are just some of the many insights this research study has uncovered. Members are encouraged to share these results with internal teams and collaborate with value chain partners to explore how digitalization can be realized within supply networks. Digitalization is reaching an inflection point and your business must be prepared for the shift. Failure to transform will not be an option for too long.

EFC will be forming a Digital Supply Chain Committee to help support the industry's collaborative movement into a new digital frontier. If your organization is interested in participating on this committee, please send an email to info@electrofed.com.

EFC thanks PwC for sharing their thought leadership and resources throughout this research process. EFC is also appreciative to the National Association of Electrical Distributors (NAED) for sponsoring this industry report. This is a strong collaborative achievement! ■

[1] 'Digitalization' is enabling, improving or transforming business functions, operations, processes and models by applying digital technologies and digitized data to create insight and knowledge for businesses to take action.

2. FOREWARD BY PwC

You know when your supply chain isn't working. You can see it when your costs are getting out of control, when your inventory levels are not in line with demand and when your customers aren't happy.

In most circumstances, the members of Electro-Federation Canada (EFC) realize that the industry supply chain today is a series of largely discrete, siloed steps both internally (through marketing, product development, manufacturing and distribution), and externally between business partners from manufacturers, distributors, wholesalers, brokers and retailers—and finally into the hands of the customer. And members realize that as most customers' enterprise processes become more digitized, traditional supply chains must also move to a digital environment.

As well, members realize that digitalization has the potential to break down organizational barriers so that the entire supply chain becomes a completely integrated ecosystem that is fully transparent to all the players involved—from the suppliers of raw materials, components, and parts, to the transporters of those supplies and finished goods, and finally to the customers demanding fulfillment.

Once built—and the building blocks are starting to be developed today—the digital supply chain will offer a new degree of resiliency and responsiveness, enabling companies that get there first to beat the competition in the effort to provide customers with the most efficient and transparent service delivery.

To assist members in making the transition to a digital supply chain, EFC has undertaken a member survey of the supply chain practices throughout the industry. We collaborated with EFC to assist and guide them in the development of the survey and the interpretation of the results. We commend EFC for taking the step forward in bringing awareness to this new industry opportunity, and wish member businesses much success as they develop and execute their digital strategies.

Lino Casalino
PricewaterhouseCoopers

3. INTRODUCTION

"Digitalization will pervade the very fabric of our society. The raw power of digital technologies in new domains such as cloud computing, robotics, 3D printing, machine learning, blockchain algorithms [will impact] how humans live, work, learn, play, innovate, transact and govern."

– *The Digital Matrix*, Venkat Venkatraman

Digitalization and technology are quickly expanding and taking hold of all of our daily interactions and activities. We use our mobile devices to track weather, to route our way to and from work, to adjust the temperature at home, to receive instant news updates and sports scores. Our devices also connect us to every song, movie and book imaginable.

These daily encounters, spurred on by faster Internet access, cloud computing and new technologies that connect devices and IoT platforms, are setting new benchmarks for how products and services are offered, and what derived benefits customers can expect. Take Uber for instance: it has become a preferred method of transportation because it reduces costs, is convenient and improves service. Amazon is a preferred e-Commerce platform for similar reasons: it is faster, more convenient, provides more options and saves money.

The convenience, service improvements, cost savings and ease-of-access that digitalization affords at home also introduce a host of new opportunities at work. The use of digitally-astute technologies such as sensors and controls, robotics, autonomous vehicles and others, help automate cross-functional operations—transforming how companies design, manufacture, distribute, deliver, install and service to meet customers' needs.

"Customers in the digital age are not passive consumers, but nodes within dynamic networks…[These] networks are redefining the marketing funnel, reshaping customers' path to purchase. Businesses need to understand the five core behaviours that drive customers in their digital experiences and interactions —[their ability to] access, engage, customize, connect and collaborate.[2]"

The electrical supply channel has an opportunity to advance its sales and service abilities by embracing new technologies that digitize processes so that we can 'access, engage, customize, connect and collaborate' with customers and other value chain partners. The threat of inaction could have huge consequences; the prowess of digitalization has the potential to render legacy services and people obsolete. Sensors, robotics, artificial intelligence, blockchain, autonomous vehicles and other technologies will alter how operational functions are performed, and by whom—from freight and logistics, to warehousing, outside sales and accounting.

Digitalization is not near, it's here:

"…The race to digitalization is no longer coming, it's already here. There is no longer time to delay in implementing strategies and executing tactical plans…there is still a general feeling in our industry that we have time. We don't." – EFC member survey respondent

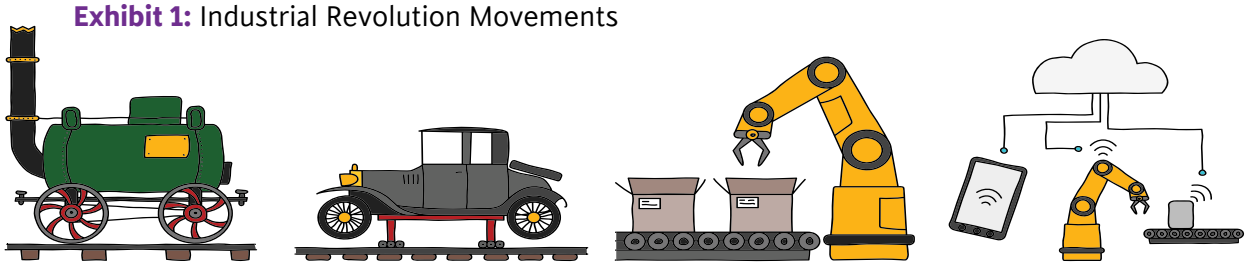
Industry 4.0

Digitalization is part of a broad evolution—one that has been progressing for decades. Each phase in the Industrial revolution has modernized the period before it: from steam engines and the first machines that mechanized work (Industry 1.0); to assembly lines that enabled mass production (Industry 2.0); to the advent of computers and automation that harnessed data and simplified processes (Industry 3.0). We are now entering the fourth cycle of this revolution: Industry 4.0.

Industry 4.0 involves the end-to-end digitization of all physical assets and the use of digital tools to connect platforms and solutions to provide anywhere, anytime access to data. The integration of data into one digital ecosystem transforms business models by allowing value chain partners to simultaneously monitor and provide data inputs to one another. This enables businesses to more effectively assess demand, new product design and development, production, inventory, procurement, distribution, transportation and service.

Just as each phase of the Industrial revolution transformed the one before it—pushing businesses towards fight or flight—the electrical industry is now at such a crossroad. This study provides a roadmap to digital growth, outlining the opportunities that our industry can expect to experience as we continue our digital transformation journey. ■

Exhibit 1: Industrial Revolution Movements



Industry 1.0

The Industrial Revolution begins. Mechanization of manufacturing with the introduction of steam and water power

Industry 2.0

Mass production assembly lines using electrical power

Industry 3.0

Automated production using electronics, programmable logic controllers (PLC), IT systems and robotics

Industry 4.0

The 'Smart Factory.' Autonomous decision making of cyber physical systems using machine learning and Big Data analysis. Interoperability through IoT and cloud

[2] Rogers, David L. (2016) *The Digital Transformation Playbook*. New York: Columbia University Press

4. BACKGROUND & METHODOLOGY

'Digitalization' is of key interest to the electrical industry. During one-on-one discussions by EFC with senior industry leaders earlier this year, this topic was identified as a top game changer that is set to impact their businesses. In response, this research study explores digital opportunities within the electrical industry supply chain, assesses the industry's current state of digital adoption, and provides recommendations on what member businesses, and the industry as a whole, will need to consider in order to make digitalization a reality.

Partnerships

To produce this report, EFC has collaborated with PricewaterhouseCoopers (PwC), an acknowledged leader in the design, development and implementation of digital supply chains. EFC has also worked closely with a Research Committee, comprised of members in operations, sales and marketing functions, to determine the overall scope, methodology and output of this study.

PwC is a Lead Sponsor of this report and has provided tremendous insight on digital supply chains throughout the research process. PwC provided a series of digitalization maturity model scorecards to help benchmark our industry's digitalization progress and map out progressive steps that lead to full development. (Members are encouraged to read PwC's "Industry 4.0" report, which offers a general, but comprehensive overview of a framework that supports a digital supply chain. The PwC report can be accessed at: https://www.strategyand.pwc.com/media/file/Industry4.0.pdf.)

The National Association of Electrical Distributors (NAED) is a Supporting Sponsor of this report. Recognizing that digitalization extends across the entire value chain and crosses borders, NAED will use this study to understand the impact digitalization will also have on their respective members. We thank NAED for their support.

Survey to Manufacturer & Distributor Members

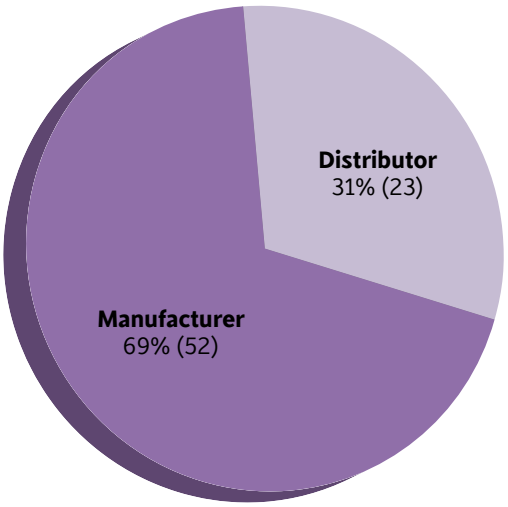
An online survey was conducted to gauge the needs and digitalization progress of Canadian electrical manufacturer and distributor member companies. A total of 75 responses were collected; more than two-thirds of respondents were manufacturers (69%) and one-third of respondents were distributors (31%). Of the respondents, 33% were large (>$150M) businesses; 23% were mid-sized ($50M - $150M); and 44% were small (<$50M). This sample size generally represents EFC's manufacturer and distributor member mix across Canada.

Focus Group with CEMRA Members

EFC also led a focus group with six manufacturers' representative members to understand this community's challenges and opportunities with digitalization. Reps are an important player in the industry—their in-field experience and close ties with customers provide a good view to the challenges and opportunities the industry might experience within a digitalized environment, especially as it relates to market needs.

The information gathered from these research inputs form the basis of this study, presenting a big picture view of where digitalization stands in the industry today—and what we can expect to be challenged with, and benefit from, as we each transform ourselves in this digital age. ■

Exhibit 2: EFC Manufacturer vs. Distributor Survey Respondents



EFC Research Committee Members:

Rob Nadler, Stanpro – Chair
Shitiz Agarwal, Schneider
Sean Bernard, Wesco Distribution
Jean-Francois Bourqui, Southwire
Leslie Clarke, Paul Wolf Electric
Andrew Corkum, Graybar
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Debbie Ianni, General Cable
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Carole Lane, General Cable
Uri Levy, Legrand
Steve Melmead, O'Neil Electric
Enzo Patrone, Paul Wolf Electric
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Swati Patel, Rick McCarten
Carol McGlogan, John Jefkins
Christine Vilim

PwC:
Lino Casalino, David Gibson

NAED:
Erika TenEyck

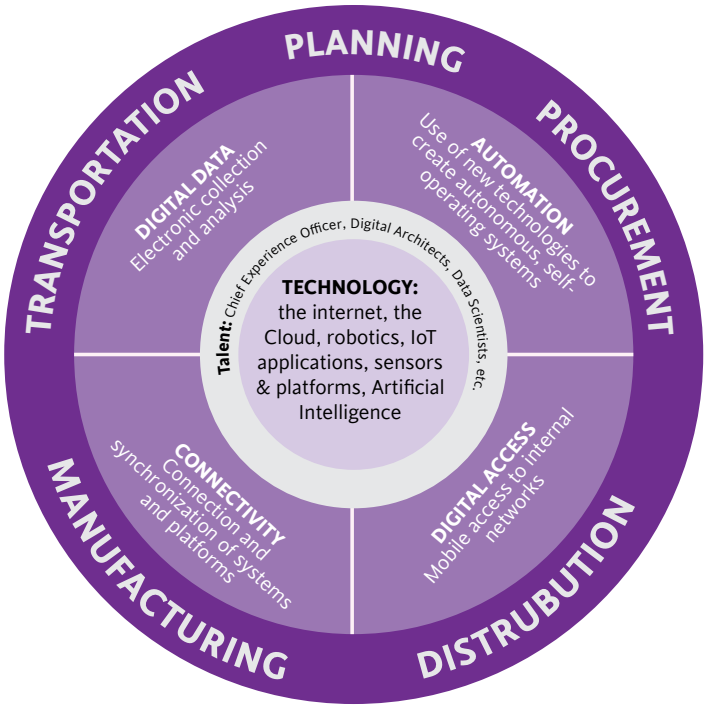
MOVING TOWARDS AN INTEGRATED SUPPLY CHAIN NETWORK

Whether your organization is set to start a journey, or your business has made significant inroads already, it is important to begin with a common understanding of what 'Digitalization' means in this study; see sidebox for a definition.

New digital technologies, such as those equipped with Cloud-based computing, sensors and Internet of Things (IoT) integration, and apps that are accessible by mobile devices, are establishing a strong foothold in integrated supply chain networks today.

Exhibit 3 shows how new technologies such as IoT, artificial intelligence, robotics, sensors and new applications enable digital functions, allowing the electronic collection and analysis of data; the synchronization and exchange of that data across the supply chain; automation into self-operating systems that minimize manual intervention; delivering real-time digital data that users can access via mobile devices and other digital platforms to make faster and better decisions.

Exhibit 3: Digitalization Ecosystem Example



What could digital collaboration look like in the electrical industry and what opportunities can we expect to gain from such a transformation?

'Digitalization' is enabling, improving or transforming business functions, operations, processes and models by applying digital technologies and digitized data to create insight and knowledge for businesses to take action.

From Traditional to Transitional...to Digital

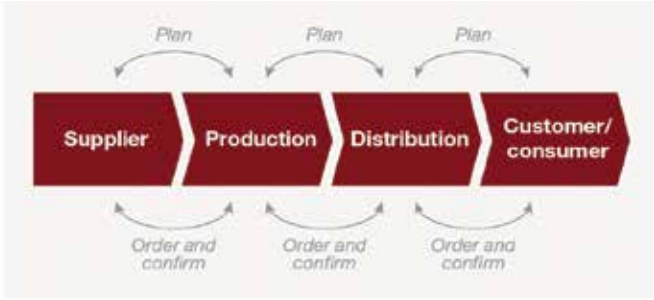
The electrical supply chain is at an important crossroad; it must determine how to move from a traditional model that has served the market well for decades, towards a new model that is connected, smart and highly-efficient. But how does the industry evolve from a traditional model to an integrated ecosystem?

To pave the path to digitalization, let's explore the channel's supply chain today. The industry employs a traditional model, one that is generally a static, linear network. While this partner-to-partner model allows for some cross-planning within the value chain, it often presents a number of key challenges, including:

- Information often resides in company-specific formats and is fragmented, limiting the supply chain's responsiveness and ability to scale quickly to meet growth opportunities.
- Creates a reactionary, push-based system that pushes inventory into the supply chain based on forecasted demand that is fraught with error, biases and buffers at all nodes.
- Creates siloes within a company's functional areas (e.g. marketing, new product development, procurement, manufacturing, etc.) as well as siloes from company to company.
- Limits operational efficiencies, resulting in inventory duplication and under-optimized logistics, transportation and services (repairs, product changes and order cancellations).

Exhibit 4: Traditional vs. Integrated Supply Chain
Source: PwC

Traditional supply chain model



Integrated supply chain ecosystem

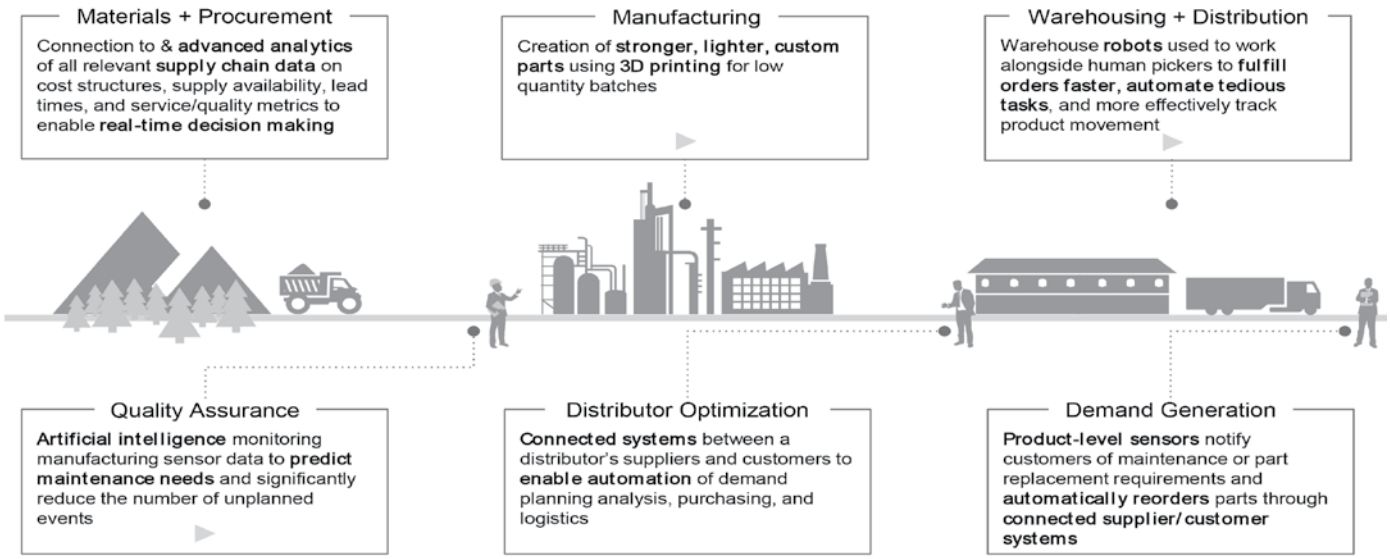
By contrast, digitalization moves to minimize the gap between demand and supply at every point in a supply network. What results is a completely integrated ecosystem that is populated with near real-time data that is demand-driven, available in the Cloud and accessible to all players in the supply chain, providing full visibility into the needs and challenges of others.

This digital framework is supported by an intelligent network of Web-enabled technologies that integrate systems, applications and processes. Indeed, this framework is also dependent on the commitment and foresight of leaders who share a common vision and drive to digitize. Paper and manual processes are replaced with autonomous digital processes that monitor and report internal activities and transactions, and provide staff and value chain partners with access to real-time information dashboards so they can make more informed changes as required. This network also connects customers to real-time, 24/7 order history, delivery tracking and account information, providing them with heightened service experiences that run parallel with their B2C expectations.

The Digitalization of Products

Achieving an integrated network is not as unattainable as it might first appear. The goods news is that digitization is somewhat familiar territory for the electrical industry. The industry has made recent advancements in the digitization of electrical products. Intelligent products such as lighting, controls and breakers are increasingly connected with Cloud-based systems and IoT platforms to provide users with new levels of data access, control, flexibility and application.

Exhibit 5: Digitalization Across the Value Chain
Source: PwC



5. LET'S GET DIGITAL (continued)

Digitally-enabled smart sensors can notify the supply chain of failures and when products need to be replaced or replenished, as well as enable the real-time tracking of performance.

Many member companies also currently employ systems and applications such as Electronic Data Interface (EDI) ordering, Vendor Managed Inventory (VMI) and Enterprise Resource Planning (ERP) systems, as well as data synchronization solutions and standards to support data sharing and digitalized operations. Unfortunately, these implementations vary from company to company, thereby preventing data and systems from connecting partners across a value chain.

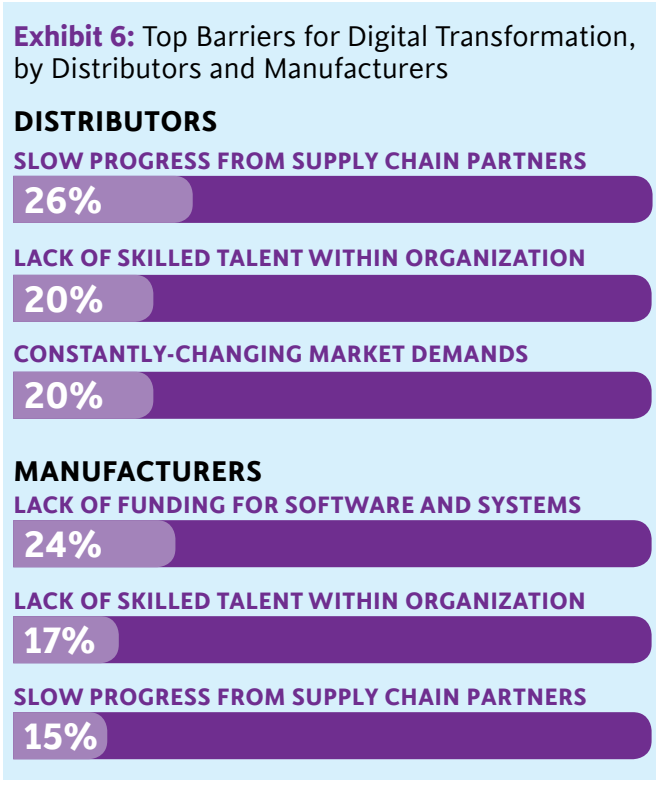
In the EFC survey, 'slow progress from supply chain partners' was identified as the top barrier preventing Distributor members from achieving digital transformation success. For Manufacturer members, the 'slow progress' barrier ranked second ('lack of skilled talent within organization' was identified as the top barrier).

The digitally-adept products also provide our industry with opportunities to enhance service offerings. Intelligent products are more commonly used to monitor usage and control functions, leading to preventative maintenance and services. Data that is captured in real-time from the product itself, is then connected to a digitalized network. One point of contention for this ideal is that product advancement is happening too quickly. During the focus group, reps raised concerns the rate at which products are evolving, not only results in high inventory obsolescence, but also makes it difficult to consistently capture and track historical data. This may be another topic for another time!

The next step in our channel's evolution is to extend our digital footprint from product innovation to supply chain transformation.

All in all, it seems fitting that the next step in our industry's evolution is to extend our digital footprint from product innovation to supply chain transformation. The vision? A complete digital supply chain network that supports the real-time use of structured and unstructured data, and the overall move towards a learning-based system which would infer significant use of artificial intelligence. The next chapter captures the benefits that can be expected through this new view of the supply chain. ■

Exhibit 6: Top Barriers for Digital Transformation, by Distributors and Manufacturers



% of respondents that ranked these as the top (1st) barrier

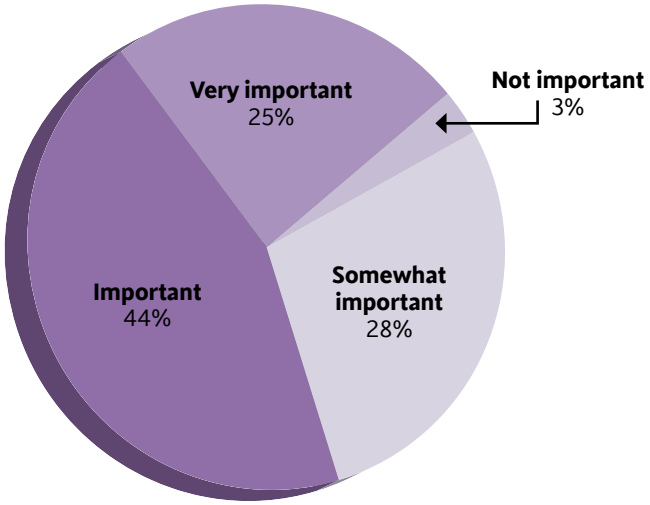
DIGITALIZATION BENEFITS & BARRIERS FOR THE CANADIAN ELECTRICAL INDUSTRY

This report has established opportunities that can be derived from an integrated network. A digital supply chain network is the archetype for operational excellence, given its ability to provide value chain partners with simultaneous, real-time and end-to-end insight on all aspects related to operations—from procurement and planning, to manufacturing, distribution, transportation, and customer touchpoints.

With the strong attention that many industries are beginning to place on such integration, how focused is the Canadian electrical industry on digital advancement?

Our survey results show that nearly 70% of manufacturer and distributor respondents consider the digital transformation of their supply chain to be 'important' or 'very important' for their organization. *Exhibit 7* shows the degrees of importance respondents placed on digital supply chain transformation.

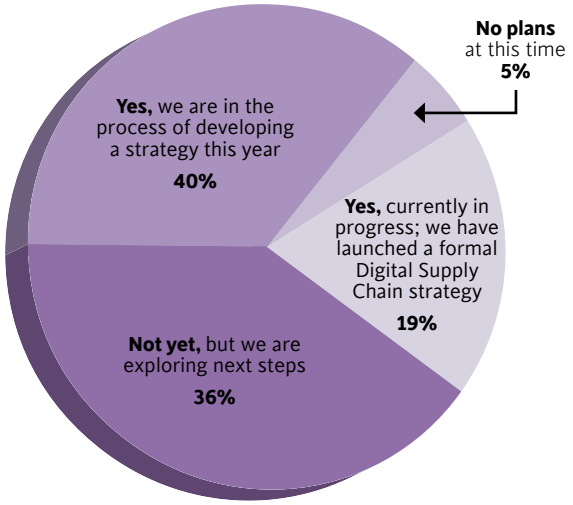
Exhibit 7: Importance of Digital Supply Chain Transformation to Members



A closer look of the results show that the importance of digital transformation is slightly higher for distributors than for manufacturers: 73% of distributors and 67% of manufacturers said this transformation is important-to-very important for their business.

Furthermore, almost two-thirds of member respondents have launched a formal digital strategy or will be developing one within a year. See *Exhibit 8*.

Exhibit 8: Development of a Digitalization Strategy



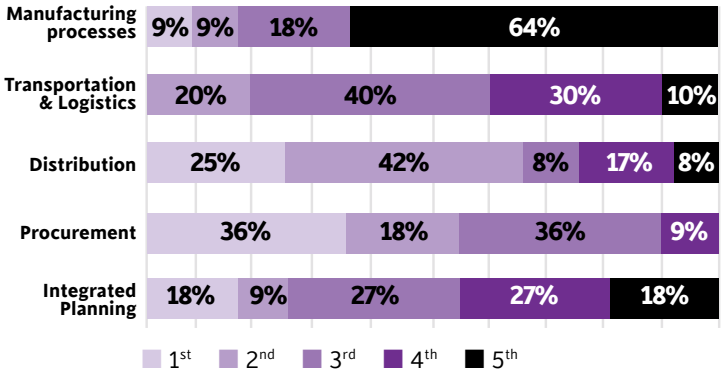
36% of respondents said they do not have a strategy planned yet, but are exploring next steps—providing a good opportunity for industry education initiatives. Only 5% are not considering digital transformation at this time (these are small manufacturers). These findings show that digital supply chain transformation is top-of-mind among channel players, and is already moving into action. *Exhibits 13 to 15* (further on in this report) show EFC members' current digital maturity levels for planning, procurement, distribution, transportation and manufacturing.

Key Focus Areas

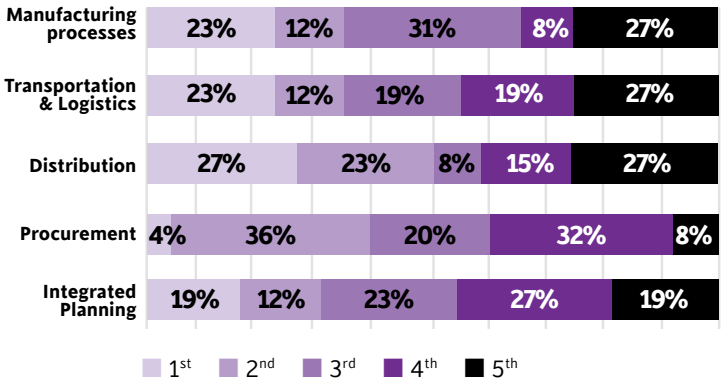
Among those members who have set a digital strategy in motion or are planning to implement one within a year (59%, combined: *Exhibit 8*), there are a few key areas of digitalization that members are most focused on with their strategy. Both manufacturers and distributors agree that the top focus areas (with the first and second ranks combined) are Distribution and Procurement. See *Exhibit 9*.

Exhibit 9: Key Areas of Digitalization Focus, Distributors vs. Manufacturers

DISTRIBUTORS



MANUFACTURERS



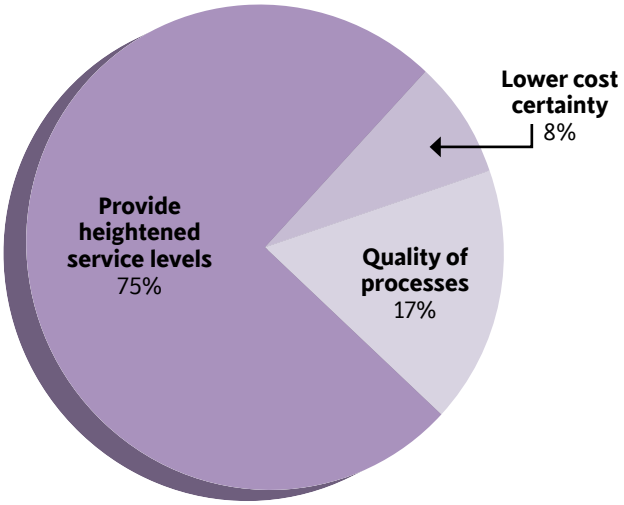
Business Benefits

The EFC survey asked members what the key driver for digital transformation is for their business. Respondents were asked to choose one of three options: improve service levels, lower cost certainty or improve quality of process. An astounding 75% of respondents chose 'improve service levels' as the primary driver.

By industry segment, almost all distributors (91%) selected 'service levels' as their top driver; compared to 68% of manufacturers who selected that option. This strong attention to service could be due to the fact that 70% of the products that distributor respondents said they sell, are *commodity-based* (versus project-based). Therefore, one would expect distributors to have more pressure to differentiate themselves based on service.

75% of survey respondents indicated that 'heightened service levels' is the key driver for digitalization in their business. Service continues to be a bench-strength that sets our industry apart from new, digital entrants.

Exhibit 10: Key Drivers for Digital Transformation



The Path to Heightened Services

Digital technology is changing how supply chains are organized and managed across industries, resulting in increased operational efficiencies and improved market position and financial performance. In fact, companies with highly-digitalized supply chains and operations can expect to have efficiency gains of 4.1% annually, while boosting revenue by 2.9% per year[3]. While this return on investment is certainly desirable, what's also rewarding is the positive play that a digitalized environment has on service levels. Through an integrated supply chain, the channel can conduct more effective predictive planning and data analysis to meet customer demand cycles and changes, providing an increased level of services and responsiveness to customer needs.

Service levels are a primary focus for member organizations today. 75% of survey respondents indicated that 'heightened services levels' is the key driver for digitalization in their business ('lower cost certainty' and 'quality of processes' were the other options available to respondents).

This finding closely correlates with the electrical industry's main strength: the personal connections that channel partners have with customers. These relationships have

[3] Retrieved online at: https://www.strategyand.pwc.com/reports/digitization-more-efficient

allowed our industry to work with customers to identify business opportunities, build strategies and provide services that cannot be matched by new market entrants. As a caution, these customer connections run the risk of becoming weakened if our industry does not adapt to changing customer needs, fuelled by B2C experiences that are forcing B2B practices to evolve.

Our industry must continue to focus on relationship management and heightening service levels, but within the new scope of a digitalized network. Digitally-native businesses (e.g. Amazon) have a clear advantage over traditional businesses—they have been constructed from the ground up to support an end-to-end digital framework. These enterprises were conceived, cultivated and steered by a mindset of people who share a common digital culture. Modernizing the foundation on which the traditional electrical industry has stood for decades will require strong collaboration, new expertise and more trust among players and partners.

Going Beyond Trust

The digital supply chain model requires a new stance in relationships among industry partners. Trust has traditionally been built on 'time' measures: who one has worked with in business for a long period of time. In the new digital age, as new technologies, people and processes are introduced, channel relationships cannot be sustained on this time factor alone; the new trust value principles between partners will be formed with collaboration, communication, transparency, flexibility and responsiveness factors. These five principles are examined in PwC's "Industry 4.0" report[4]:

- **COLLABORATION:** natural development of collaboration to capture intrinsic supply chain value
- **COMMUNICATION:** information availability to all supply chain partners simultaneously
- **TRANSPARENCY:** complete view of the supply chain; trust a primary factor for this
- **FLEXIBILITY:** production changes and end customer demand changes are rapidly assessed
- **RESPONSIVENESS:** real-time responses for predictive forecasting and analytics

Let's take a closer look at each principle and the impact that each may have on the electrical supply chain.

Collaboration

The digitalization of the electrical supply chain, and by virtue, its extended value chain, can only be as robust as the digital transformation of its weakest link.

The need for collaboration is of paramount importance to members—and, as stated earlier, is something survey respondents consider a key barrier to achieving digital transformation ('slow progress from channel partners' was rated a top barrier to change). This concern was shown again when respondents were asked to rate overall Partner Collaboration efforts: 45% of those surveyed, said they are currently in only stage two (out of a possible five stages) in their collaboration efforts – *see below for what constitutes Stage 2 performance*.[5]

PARTNER COLLABORATION SCORECARD

Stage 2 Identifiers:

- **Collaboration done for specific projects or initiatives not only for portions of the network**
- **Some risk assessment done at local level. No corporate strategy**
- **Tight controls, diligent and comprehensive approval process**
- **Enterprise system maintains records of POs as well as contracts, CWAs, and other contracting tools**
- **Single platform for model but the technology does not have optimization capabilities for analysis**
- **Reports are manually run and sent throughout network ad hoc**
- **Repository available to store contracts, but does not contain records of all contracts**
- **SOWs created for services and materials from major suppliers; short term contracts used otherwise**

Source: from PwC's Digital Transformation Scorecards

This barrier was also identified in a study conducted by the National Association of Wholesaler-Distributors (NAW), which surveyed leading distributor CEOs. When asked how participants felt about collaborating to share data (i.e. data that might come from CRM or marketing automation tools) with their manufacturer partners for mutual benefit, the study found many were not in favour of this. The study also referenced various buying groups who are exploring initiatives around digital collaboration (incentive plans for distributors, etc.)—some of the initiatives have fallen short in enabling new services or customer experiences to shore up the value chain.[6]

This concern among U.S. counterparts raises additional issues north of the border for our industry. As some Canadian enterprises are governed by U.S. or other global divisions, what level of collaboration will members be able to engage in based on larger North American and global digital supply chain application models? This situation will need to be considered.

Collaboration will be key if this industry is to digitally transform. Unlike e-Commerce platforms and other applications that have provided a business with a competitive edge over others, the digitalization of supply chain networks will be most efficient and effective if all players within the industry orchestrate change for all.

[4] Schrauf, Stefan and Berttram, Philipp (2016). "Industry 4.0: How Digitalization Makes the Supply Chain More Efficient, Agile and Customer-focused". PwC Strategy&. Retrieved online at: https://www.strategyand.pwc.com/media/file/Industry4.0.pdf

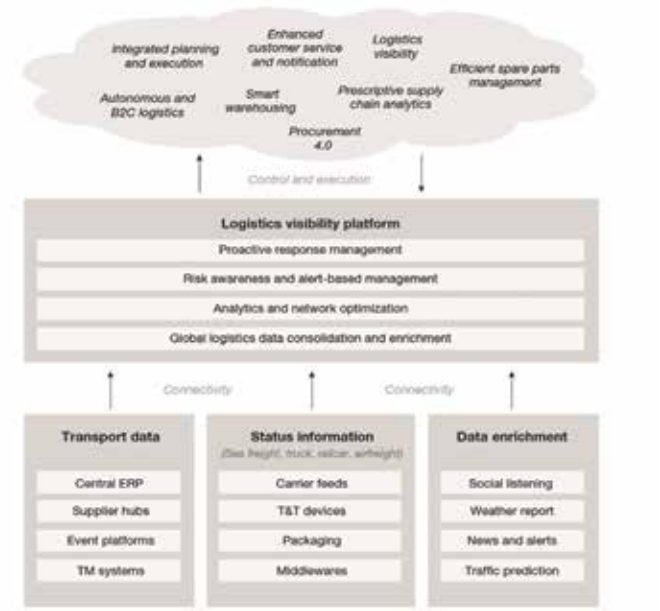
[5] PwC's Digitalization scorecards are shown in Chapter 8 of this report. The scorecards provide digital maturity benchmarks within several categories and are for information purposes only. The scorecards are not specifically designed for the electrical industry; they are for general industry benchmarking.

[6] Dancer, Mark (2017). "CEO Insights on Innovating the Distributor for the Digital Age". NAW Institute for Distribution Excellence: p. 18.

Communication

Within an organization, no department can remain a silo, especially as supply chain functions transform into a digital network, where all data is digitized and available to employees, partners and customers. The cross-sharing of information improves overall communication both within and beyond an enterprise. A business' actions in the warehouse impact marketing, research and development, operations and logistics, distribution and other groups that are involved in planning and procurement.

Exhibit 11: Logistics Transparency Framework



Transparency

With widened communication channels, come the benefit of transparent information that allows all supply chain partners to make better business decisions. Digitalized supply chains enable end-to-end transparency.

"Supply and demand signals will originate at any point and travel immediately throughout the network. Low levels of a critical raw material, the shutdown of a major plant, a sudden increase in customer demand — all such information will be visible throughout the system, in real time. That in turn will allow all players — and most important, the customer — to plan accordingly."[7]

Trust goes hand-in-hand with transparency. During EFC's focus group with select EFC manufacturers' representatives, participants voiced how important 'trust' will be in our industry's movement towards digitalization. Reps require the same access to product information as manufacturers' sales staff. The more manufacturing processes and product information is digitalized and becomes transparent, manufacturers will have the opportunity to provide reps and distributors with digital access to the flow of products within their supply chain, resulting in better expedited customer orders, or in the case of low stock or logistics challenges, an opportunity for sales reps to proactively aid in a resolution.

Flexibility

Companies are often challenged to scale their supply chains up or down as demand and supply circumstances require. Scalability becomes more attainable when a supply chain has been infused with digitally-enabled connectivity and intelligence. Manual processes are reduced, allowing operations to become more easily optimized and enabling users to track and address errors and anomalies more quickly.

Responsiveness

Speed will become the digital future's most important currency; the speed at which a business can respond to changing demand and supply signals and address customers' needs, will separate leading businesses from those who lag. Digital supply chains will drastically improve response times and agility, allowing businesses to quickly address gaps in the supply chain and engage in more reliable predictive forecasting to stay in step with changing market dynamics.

Barriers to Overcome

This research report has explored the value-add of digitalization within our industry and how an integrated supply chain network could strengthen it. While the benefits of a digital supply chain are clear, the following are some key barriers that must be addressed to move forward in our journey.

Talent

The biggest challenge to digitalization is not the technology – it is the people, and the survey results concur. Success will largely depend on an organization's Digital IQ and what extent leaders such as CEOs, COOs, CTOs, or CIOs define, lead and communicate the transformation to value chain partners, including employees. Large dependency will need to be placed on employees who will be required to roll out digital processes and services—and to find meaning in the vast volumes of data that their organization receives. To this end, change management will be a crucial part of an organization's go-forward digital strategy. Supply chain talent will require a refocus: from recruiting people for traditional roles to developing recruitment and training efforts to build a culture of digital architects.[8]

Slow Progress

The threat of inaction could be fierce. With heightened customer expectations, new technology advancements and new entrants paving a path in the B2B market, now is the time for the electrical industry to move forward with digital transformation.

[7] Schrauf, Stefan and Berttram, Philipp (2016). "Industry 4.0: How Digitalization Makes the Supply Chain More Efficient, Agile and Customer-focused". PwC Strategy&. Retrieved online at: https://www.strategyand.pwc.com/media/file/Industry4.0.pdf

[8] For other digital talent roles and functions that organizations can consider, go to: http://www.adweek.com/digital/a-guide-to-the-10-next-hot-jobs-in-digital-marketing-and-for-several-years-to-come/

If we move too slowly, our channel could be swept aside. Think about the various markets that are struggling to keep pace in the face of disruption: "at least six conventional industries have been eviscerated by digital innovation in the past two decades—music, video-renting, books, taxis, newspapers and clothes retailing." [9]

What other markets are at risk? In an article in *The Globe & Mail*, it is suggested that the wholesale market is being closely watched and approached by the likes of Amazon: "Amazon's interest in the B2B wholesale and distribution market is said to stem from the inefficiencies that exist within the space. Amazon Business is purpose-built to address the concerns of B2B purchasers and professional procurement teams concurrently." [10]

Technology

Today, the industry employs a wide range of disparate systems and applications that are not synchronized or interconnected, resulting in fragmented information that resides in siloes within organizations and across the value chain. A concerted effort to bridge current technologies and invest in new platforms, must be considered so that supply chain functions can be streamlined and made consistent. Digital businesses such as Amazon have realized the strength that a single platform offers and other industries are also automating their supply chain through a single technology platform. It is time for our industry to take a close look at how a standardized platform could work for the channel. Remember, digital transformation will require collaboration—and this includes a collaborative approach to how technology is deployed and used.

Investment

Businesses within our industry will need to determine how to raise capital for digital investments. With large investments already made to support CRM, ERP and other such applications, businesses will need to assess how to leverage these technology assets with digital platforms to digitize their processes so that all business data can shared across systems. Investment in training and developing skilled employees can help to lead the way to a new digital culture within an organization.

In the same article from *The Economist* (see footnote 9), it was also stated that "over the next decade, conventional industries will face an onslaught from tech competitors wielding vast financial resources, new technologies and massive reserves of data...Large firms have raised their game...most have digital or e-commerce divisions." In some cases, the large companies are spending five times more on research and development than the big technology companies do [Apple, Amazon, Alphabet, Facebook and Microsoft].

Raising funds might be especially difficult for smaller enterprises, such as those surveyed by EFC who intend to build a digital strategy. In EFC's research survey, 60% of small distributors are exploring next steps; 39% of small manufacturers are in the exploration phase. Will this investment barrier widen the gap even more between large and small businesses in our industry? The opportunities for small businesses to become digitalized are profound, but they will need to account for risks and be more strategic in their digital direction.

This provides a good segway for the rep businesses. While new technology offers the promise of digitized processes—and possibly less staffing for certain functions—reps expressed concern that they may be relegated to filling manufacturers' staffing gaps. Many reps are currently expected to support CRM, EDI and other systems deployed by each of their manufacturer partners (this can be upwards of 10-20 different manufacturers for each rep business). How can reps be expected to invest in supporting such a myriad of manufacturers' systems and balance the risk that comes with the typical 30-day termination clause that they are often contracted to by manufacturers? Trust during this digital transformation will take on the value of more data transparency and better-balanced contract terms between manufacturer and rep partners.

The 'Digital Enabler' characteristics in the next chapter provide insight on what areas of investment businesses will need to explore. These relate to how technology, process, partnering, organization and skills, and performance management enablers can help propel an organization towards digitalization success.

Realizing growth potential in the rapidly-changing world of business, requires more than simply adding digital technologies, analytics and reporting, and cloud and cognitive computing to your supply chain. It requires the re-imagination of the supply chain as a digital network that leverages technologies and digital architectures in unison to drive collaboration and bottom-and-top-line growth. ■

RIVER OF MEMBER VIEWS

(from EFC Digitalization Survey)

"Data collection allows the specific review of stats that can be used to develop new service levels for specific market and customer segments. Nothing is uniform anymore - customization is the key."

"When the quality and frequency of data sharing increases among partners, the uniformity and consistency of the customer experience increases, and we believe more than ever before that customers are buying an experience vs. a basket of products."

"By working from one integrated set of data, we can better see and manage the impact of events resulting in better cost, quality and service levels."

"Improves response times, agility, ability to meet quickly-changing market dynamics, improves efficiency -- do more with less, makes it far easier to manage master data."

"It helps streamline the workflow in order to understand volumes and customer requirements. This will allow us to proactively address resource and equipment needs throughout the organization."

[9] Schumpeter (September 30, 2017). "Uneasy accommodation". *The Economist*, p. 63.

[10] Mohammad, Qasim (January 8, 2018). "Amazon's Next Mountain: B2B Procurement". *The Globe and Mail*, p. B4.

HOW DOES THE INDUSTRY MEASURE UP?

To understand the digital proficiency of the electrical industry today, we must first learn how far we have come. We know that the desire to achieve digital transformation is strong: nearly 70% of survey respondents said they recognize the importance and are taking next steps towards action. To gauge the industry's current level of progress, we asked manufacturer and distributor members to benchmark their stage of digital maturity by using a set of measures, shown below.

Benchmarking Performance with Scorecards

PwC provided a set of comprehensive scorecards[11] to help benchmark industry performance in several areas:

Set 1: Digital Supply Chain "Functions"

Planning | Procurement | Distribution | Manufacturing | Transportation

Set 2: Digital Supply Chain "Enablers"

Technology | Process | Partnering | Organization & Skills | Performance Management

Rating System: A five-point rating scale was used by members to measure their current level of adoption in the above supply chain "functional" areas and their use of "enablers"

Based on aggregate survey results, the Canadian electrical industry is generally positioned in stages two and three ('emerging' and 'advanced', respectively) within the digital transformation process. There were of course, some members who are further along and appear in stages 4 and 5 ('differentiated' and 'digital champs', respectively).

This progress might come as a surprise to some when we consider how widespread the barriers to change still are within the industry. According to EFC's survey results, slow progression from supply chain partners, little digital expertise, lack of awareness and acceptance from internal ranks from within organizations, and inadequate internal digital processes and tools, continue to hamper digital advancement. Even so, the progress is encouraging as it demonstrates that many leaders are forward-thinking in their approach. As noted earlier, close to 70% of survey respondents said digital transformation is important-to-very important to their business, and many already have a digital strategy in place or are developing one within one year.

Let's now take a closer look at the survey results from the two scorecard sets: "Functions" and "Enablers".

Digital Supply Chain "Function" Scorecards

The very core of a supply chain includes five key functions: Planning, Procurement, Distribution, Manufacturing and Transportation. Let's explore the degree to which these areas have become digitalized within the industry.

Exhibit 12: Digital Supply Chain Rating System

STAGE 1: BASIC	STAGE 2: EMERGENT	STAGE 3: ADVANCED	STAGE 4: DIFFERENTIATED	STAGE 5: DIGITAL CHAMPION
Discrete supply chain processes. Resources managed at department level and performance measured at functional level.	Business has identified a need to develop a digitally-enhanced, customer-driven enterprise strategy, but deployment is on a project-by-project basis.	Company-wide process and data model continuously measured at the company, process, and diagnostic levels. Resources managed at both functional and cross-functional levels.	Strategic partner collaboration throughout the global supply chain: identifies joint business objectives and action plans; enforces common processes and data sharing; defines, monitors, and reacts to performance metrics; achieves basic transparency throughout the supply chain.	Collaborative supply chain ecosystem enabled by digital solutions: aligns participating companies' business objectives and associated processes; results in proactive acting, real-time planning, decision making, and execution of supply chain responses to customer requirements and supply chain disruptions.

[11] The PwC scorecards are for information purposes only; they are not specifically designed for the electrical industry, but are to be used for general industry benchmarking.

Exhibit 13: Digital Supply Chain 'Functions' - Overall Industry Performance

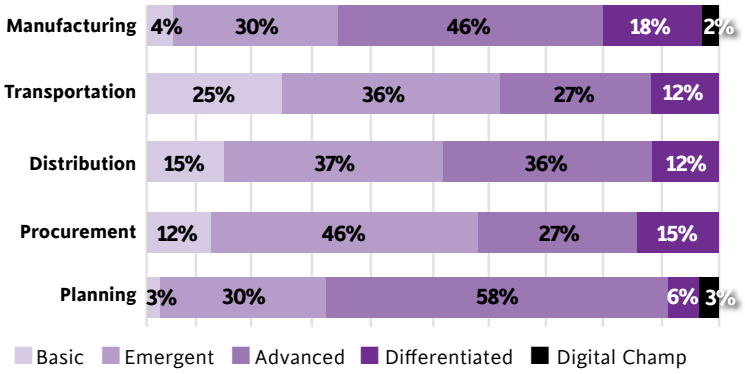
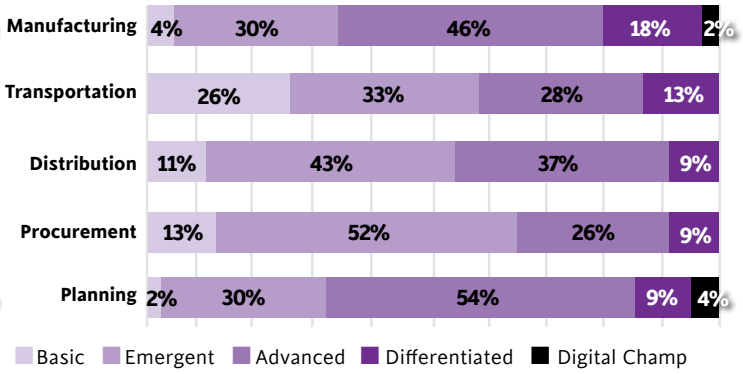


Exhibit 14: Manufacturers' Report Card – Digitalization Progress



Planning

Based on the combined manufacturer and distributor results, Planning is the most developed area of digitalization so far, with close to 70% of respondents in one of the three most progressive stages: 'advanced' (58%), 'differentiated' (6%) and 'digital champions' (3%).

58% of respondents in the 'advanced' stage of digitalized Planning, indicated that they have achieved the following:

- Integrated systems in place to provide critical data for effective performance management/ reporting
- Use of a demand planning dashboard for robust reporting with capability for key data roll-up and drill-down
- Effective use of statistical analysis tools and ERP system(s) for demand, supply and distribution planning
- Consumption of forecast monitored and supply constraints analyzed with advanced "what if" tools
- Incorporates select customers and suppliers' data and information
- Alerts are accessed and managed through technology

Distribution & Procurement

Earlier in this report, it was shown that survey respondents are primarily focusing their digitalization efforts on Distribution, followed by Procurement. This focus is paying off: combined results from the scorecards show that Distribution digitalization is tracking well, with 73% in 'emergent' and 'advanced' stages of transformation, and 12% have already progressed to the 'differentiated' stage. Procurement digitalization is also on a positive track, with more than 70% of respondents in 'emergent' and 'advanced' stages, and 15% already in the 'differentiated' stage.

By segment, there are some variances, but not many. The graphs that follow illustrate the channel's performance by industry segment (manufacturers and distributors):

Exhibit 14 shows that digitalization in Manufacturing represents the most mature function area:

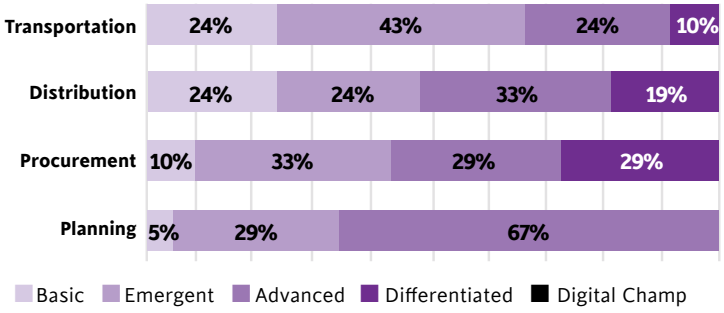
- Manufacturer members have moved beyond the 'basic' stage and almost 70% are beyond the 'emergent' stage
- 20% have moved beyond 'advanced' into 'differentiated' – and 'digital champs' are beginning to develop.

Within Planning, two-thirds have moved beyond 'emergent' and 13% have moved beyond 'advanced'.

Procurement and Distribution among manufacturers also have similar levels of development. Transportation is less developed than the other areas; one-quarter of respondents have yet to move up from 'basic' Transportation digitization.

Distributors have made similar progress, as shown below in Exhibit 15.

Exhibit 15: Distributors' Report Card – Digitalization Progress



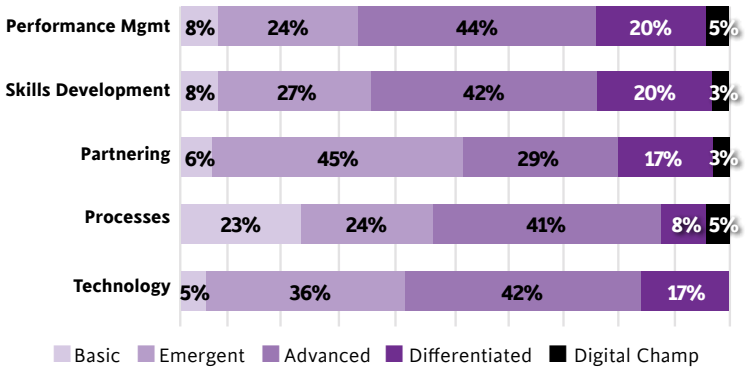
For distributor members, Planning is the most digitalized, and shows a very similar profile to manufacturers, with two-thirds having moved beyond the 'emergent' stage. Procurement is next and is shown to be more digitalized by distributors than manufacturers so far, with 58% moving beyond 'emergent', and half of these having moved on to 'differentiated' (by comparison, only 35% of manufacturers moved beyond 'emergent' and less than one-third have progressed to 'differentiation').

Distributors lead manufacturers in the race towards digitalized Distribution, but both segments have developed several 'digital champs' in this area. The digitalization of Transportation lags the other areas, although activity is still somewhat strong, with one in three already having moved beyond 'emergent'. Distributors appear to be more technologically advanced than manufacturers.

Digital Supply Chain "Enablers" Scorecards

Next, is a look at the digital "enablers" that all survey respondents (manufacturers and distributors) have considered to date, to support their supply chain functions. As a reminder, the key enablers include: Technology, Process, Partnering, Organization & Skills, and Performance Management.

Exhibit 16: Digital Supply Chain 'Enablers' - Overall Industry Performance



On the next page, *Exhibit 18* outlines the main findings from the three graphs on this page.

Let's take a closer look at some of the findings of this chart and assess how they relate to previous findings in this report:

Performance Management & Cost Certainty

In the survey, members were asked to identify one key driver for digital supply chain transformation. As noted earlier in this report, 'providing heightened service levels' received an astounding response rate (75%), which bodes well for the focus members have on improving overall customer service levels.

Notably, however, only 8% of respondents indicated that 'lowering cost certainties' was a key driver. This low ranking could be indicative of the progression that the industry appears to have already made in Performance Management (as per the above chart). Members may have previously focused on, and already achieved, internal cost certainties. The scorecard for Performance Management pegs these attributes as those employed by 'digital champs':

- All collaborative tools are integrated to make the performance management seamless for all users within the supply chain
- A complete, balanced, multi-level system of metrics is defined and used across the enterprise for end-to-end performance
- Supply chain performance management is automated as part of an overall Corporate Performance Management/Continuous Improvement approach
- Trends are predicted, with minimal human intervention, and costs are known for warehouses, transportation and production, with allocations made for business units, customer or product

Exhibit 17: Digital Supply Chain 'Enablers' - Performance by Segment (Distributors and Manufacturers)

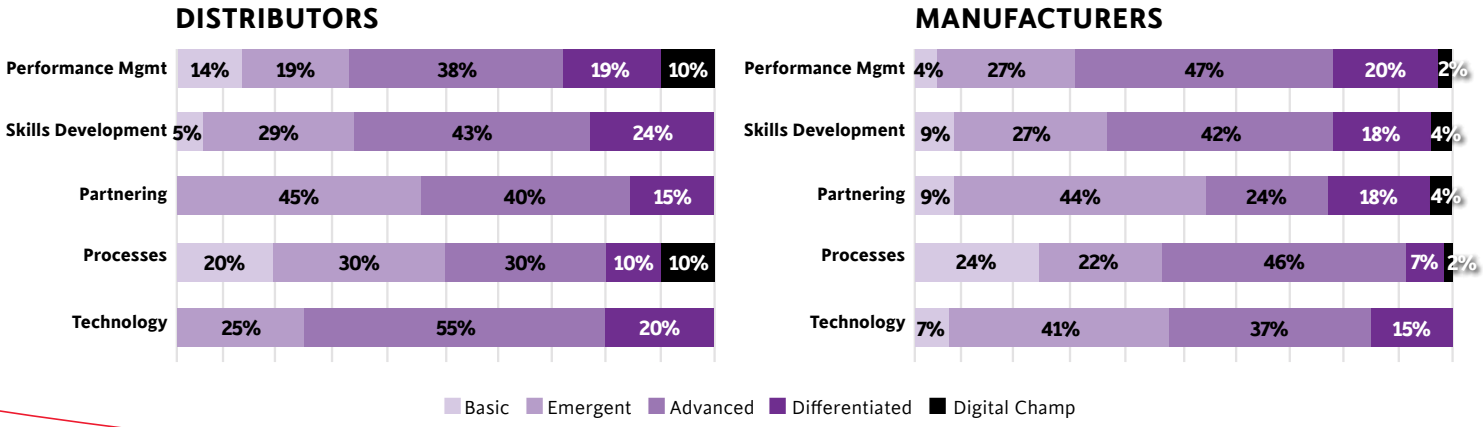


Exhibit 18: Digital Supply Chain "Enablers" – Industry Performance

Technology	Process	Partnering	Organization & Skills	Performance Management
Two-thirds of distributors identified themselves as 'advanced' or 'differentiated' (55% & 20%, respectively), while only half of manufacturers identified themselves as 'advanced' (37%) or 'differentiated' (15%). No 'digital champs' were listed by either segment.	Half of respondents are in 'basic' or 'emergent' stages. Distributors had more than twice the number in the 'differentiated' and 'digital champs' (combined, 20%) stages, versus manufacturers (9%). This makes sense when you consider that distributors are most often the front-line representatives to customers and require efficient digital processes to service users.	While 9% of manufacturers have yet to move beyond the 'basic' stage, almost half of respondents are 'emergent' (44%) – and almost twice as many distributors than manufacturers are 'advanced' (40% vs. 24%, respectively). Both groups are 'differentiated' (15% vs. 18%), and 4% of manufacturers are 'digital champs'.	Rankings for both segments show similar development scores, with nearly half of respondents at the 'advanced' level, and another one-quarter having moved beyond.	Overall, this area has the highest positive rankings than the other categories, with two-thirds of respondents shown as 'advanced' or better. Members within both distributor and manufacturer segments have identified themselves as 'digital champs' (10% and 2% respectively) in this area.

Technology

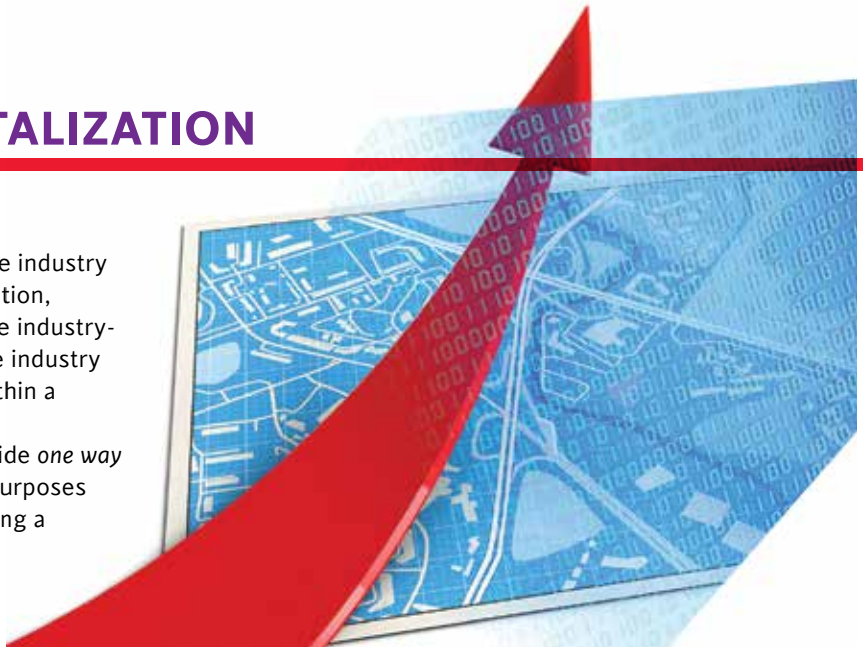
Based on the survey results, the industry appears to be tracking well in its efforts to digitalize supply chains with technology, however we still have a long road ahead. For manufacturers and distributors to further advance in this area, thought will need to be given to how the systems can connect with value chain partners to provide synchronized, real-time data, and how the vast data residing within new infrastructures will be managed, interpreted and applied to map out a positive user experience.

Skills and Organization

The scorecard ranking for Skills and Organization is interesting. 65% of survey respondents ranked themselves in stages 3 to 5 ("advanced", "differentiated" and "digital champions"). Performance is shown to be high based on the scorecards, however, "digital talent" was named one of the top three barriers among respondents—and this area received numerous comments from survey respondents in the survey as well.

During both the focus group with reps and EFC's Research Committee meetings, members emphasized our slow progression in this area. Many expressed concern with the lack of digital resources, knowledge and skills in the industry today. They said organizations will need to train and recruit a new breed of data scientists and user experience designers—leaders who can program pricing algorithms and automate processes to manage and interpret data so all value chain partners have the information they need to make more informed decisions. ■

8. A ROADMAP FOR DIGITALIZATION



While the previous chapter shows that the industry has made some progress with digitalization, there is still some work to do to achieve industry-wide success. The scorecards are used to measure industry advancement in 'functional' and 'enabler' areas within a digital supply chain network.

It is important to note that the scorecards provide *one way* to benchmark progress; they are for information purposes only and offer organizations suggestions for planning a strategic roadmap for the pursuit of digitalization. The scorecards also help open the door for discussion among team leaders and value chain partners.

To view a summary of all stages within each set of scorecards, see Appendices A and B.

Companies must develop a clear strategy that is fully responsive to a digital supply chain environment. As shown in the previous chapter, this strategy cannot be solely based on a company's current operations and business model—it must consider the following enablers[12]:

- **Technology:** Create an internal roadmap of the technologies, old and new, that will underpin the digital supply chain, including the information integration layer, database and analytics capabilities, and the Cloud.
- **Processes:** Establish new end-to-end processes connecting suppliers and customers, such as how to collaborate on cloud-based platforms.
- **Partnering:** Focus on boosting your ability to partner with other companies, as the fully-integrated supply chain cannot be built without collaborating with a wide variety of suppliers, distributors and technology providers.
- **Organization and Skills:** Generate an understanding of the mechanics of the value chain. Become a supply chain "orchestrator": seeing, managing and optimizing the entire chain. Achieving this will require a shift to an open, fast-learning digital culture that promotes communication across different programs and user groups. Develop the talent and expertise needed to build the technology and carry out the new supply chain operations.
- **Performance Management:** Develop a set of straightforward business rules covering the management of the supply chain, and the key performance indicators needed to measure outcomes.

EFC also has a role to play in supporting members' digital transformation. Thought will need to be given on how this initiative can be undertaken by members as a collective effort. Could the industry look at standardizing processes to govern how data is accessed and shared between value chain partners? EFC can play a role in moving this forward, however, member involvement will be crucial for this to gain traction. Digital champions from member companies will be needed to help support and guide this effort. With designated digital champions, clear expectations and timelines in place, the electrical industry can be well positioned to collectively achieve digital transformation success. ■

12 Schrauf, Stefan and Berttram, Philipp (2016). "Industry 4.0: How Digitalization Makes the Supply Chain More Efficient, Agile and Customer-focused". PwC Strategy&. Retrieved online at: https://www.strategyand.pwc.com/media/file/Industry4.0.pdf

9. THE LAST MILE: INDUSTRY OPPORTUNITIES & CONCLUSION

Digitalization transformation is one of the most important business trends of our time. It will require a change in how the electrical industry collaborates with value chain partners, how efficiently businesses digitize operations and processes, and how diligently they embed a digital culture within their organization.

The following are several actions and recommendations for the industry to explore to help advance digital supply chain initiatives:

"I truly believe that the "race" to digitalization is no longer coming, it's already here. There is no longer time to delay in implementing strategies and executing tactical plans, and I feel like there is still a general feeling in our industry that we have time. We don't."

– EFC Member Survey Respondent

EFC Involvement

A Digital Supply Chain Committee will be formed to explore opportunities that the industry can take together, to overcome barriers and move into the next frontier of a digital age. The committee will explore various **training and education** programs that would be of value to members. EFC and the committee will also explore opportunities related to **recruiting more talent** into the electrical industry—particularly, those with digitally-advanced experience and skillsets. The EFC Scholarship Program could be a tool used to attract digital expertise to our industry. Finally, the committee will need to give some thought on how the **standardization** of processes and/or platforms might be implemented across the industry to provide consistency in data collection and data sharing. If a standardized method is to be implemented, EFC's role would need to be clearly defined and members would be required to put forth a digital champion from their organization to help lead the effort.

Executive engagement is key. Members are encouraged to send a thought leader from their company who has expertise in digital supply chains and/or IT to participate in EFC's Digital Supply Chain Committee. Please send an email to info@electrofed.com with the name(s) of digital champions within your organization.

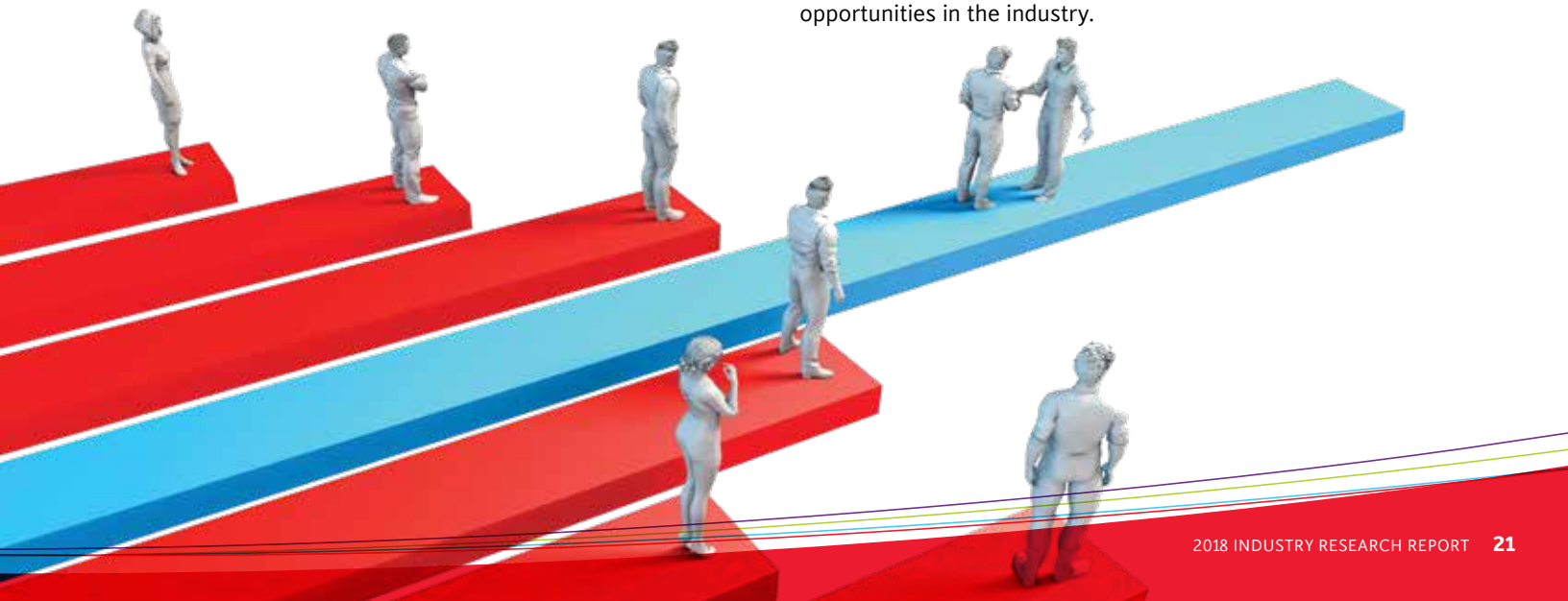
Industry Involvement

As new technology continues to develop and customer expectations for real-time information heightens, members will be required to build and implement digital strategies across their value chain.

Collaboration will play an important role in digital transformation success. Member organizations will be required to work closely with their employees, partners and customers to identify business opportunities and build digital strategies for mutual benefit. Trust will be a key factor going forward; it will be based less on familiarity, and more on collaboration, communication, transparency, flexibility and responsiveness—and in the end, will heighten service levels and solidify customer relationships.

Change management will also be a critical part of an organization's go-forward digital strategy. There will be large dependency on developing a digital culture within organizations to ensure employees with the right knowledge and skills are in place to drive digital processes and services. Supply chain talent will require a shift in focus—members will be required to develop recruitment and training initiatives to support their digital transformation efforts.

Our industry's goal must be to collectively transform the electrical supply chain into one that is more agile, transparent and robust. Digitalization will provide our industry with the bench-strength it needs to amplify what we do best: servicing customers. This transformation is essential for growth opportunities in the industry.



DIGITAL SUPPLY CHAIN 'FUNCTIONS' SCORECARDS – 'PLANNING' & LINK TO OTHERS

The following scorecards showcase Digital Supply Chain 'Functions". These have been provided by PwC as a tool to benchmark digitalization progress, and are for information purposes only. The models presented should not be interpreted as a full strategy; they are offered to provide guidance only.

An example of one of five "Function" scorecards is shown below. This, and all other scorecards are available online – follow the URL listed below for access.

PLANNING

A	B	C	D	E
Limited to no use of connectivity platforms in the supply chain planning setup Poor visibility to end-to-end planning data; limited useful information Extensive use of spreadsheets and data extracts from disparate sources Information is developed, as required Use of disparate heuristics and tribal knowledge by each functional manager to plan and manage the supply chain No ability to aggregate data	Excel used to aggregate and analyze demand-supply data Limited, but increasing, use of ERP system for supply chain planning Minimal integration of independent spreadsheets Difficult to link operational data to financial forecasts Information is provided cross-functionally Limited, but increasing, use of statistical analysis and market intelligence Significant effort needed to aggregate data No collaborative capabilities No predefined alerts or actionable messages	Integrated systems in place to provide critical data for effective performance management/reporting in meetings Information flow is synchronized with meetings cadence Use of a demand planning dashboard for robust reporting with capability for key data roll-up & drill-down Effective use of statistical analysis tools and ERP system(s) for demand, supply and distribution planning Consumption of forecast monitored and supply constraints analyzed with advanced "what if" tools Incorporates select customers' and suppliers' data and information Alerts accessed and managed through technology	Integrated systems provide accurate end-to-end visibility and scenario analysis capabilities to make data-driven decisions for optimizing margins and supply chain performance Use of integrated scenario/"what-if" analysis techniques and tools in conjunction with financial modeling "What-if" analyses are available for future access to archive critical decisions Dynamic dashboards can be instantly modified to enable real-time analysis Automated workflow, complete with pre-defined alerts, is used facilitate the process Integrated collaborative tools make the decision process seamless	Use of Artificial Intelligence/ Markup Language to automate and improve accuracy in demand forecasting/planning at scale Predictive analytics and demand planning Complete use of data analytics solutions and systems for: multiple functional silos, internal integration of single functions, external integration of key partners and value chain strategy Proactive demand sensing and multi-level demand consolidation for the customer Dynamic real-time inventory management for a multistage supply chain and warehouse network Utilization of digital customer and configuration data, sales data, service needs, and external data Integrated material requirements planning. Vendor-managed inventory/consignment stock, visibility on inventory; Procurement 4.0 Vertical integrated real-time planning in production (including manufacturing execution system introduction) End-customer demand changes are rapidly assessed

• Procurement • Distribution • Manufacturing • Transportation

Follow this link to access this above scorecard and all others listed:
www.electrofed.com/digitalization-scorecards/

DIGITAL SUPPLY CHAIN 'ENABLERS' SCORECARDS – TECHNOLOGY' & LINK TO OTHERS

The following scorecards showcase Digital Supply Chain 'Enablers". These have been provided by PwC as a tool to benchmark digitalization progress, and are for information purposes only. The models presented should not be interpreted as a full strategy; they are offered to provide guidance only.

An example of one of five "Enabler" scorecards is shown below. This, and all other scorecards are available online – follow the URL listed below for access.

TECHNOLOGY

A	B	C	D	E
PC-based, manual and disparate tools in place across supply chain organization No involvement of technology in supply chain strategic decisions No supply chain technology roadmap Supply chain performance is constrained by difficulties of making software changes to adapt to business needs Poor application integration limiting effective collaboration and decision making Data maintained in multiple systems and is inconsistent or incomplete. Low confidence in data quality	Ad-hoc, highly-customized Technology components exist, but only address some supply chain business capabilities Informal and limited involvement of technology in some supply chain functions on strategic decisions Supply chain technology portfolio are evaluated on a one-off basis Existing applications can be changed but require extensive development, testing and retraining effort. Business needs are met after significant time lag Minimal integration between applications in selected businesses Basic application integration agility provides limited collaboration and support to achieve business goals Some common data elements in different systems but still has significant inconsistencies requiring reconciliation	Commercially-available technology components exist that provide most critical supply chain business capabilities Formal, active involvement of technology in most supply chain strategic decisions Limited long-term (3-5 year) planning around supply chain technology portfolio Applications can accommodate ongoing changes in the business with minimum effort Some integration between key business applications across the organization Mature application integration speed, enabling information sharing and more frequent collaboration. Supply chain technology is trusted as the source to support decision-making Centralized master data management in place, but not consistently applied across the organization. Increasing trust in data accuracy	Technology components exist that provide some supply chain leadership/ innovation Technology is fully incorporated and involved in all supply chain strategic decisions Formal 3-5 year supply chain technology roadmap in place and reviewed as during strategic decision sessions Applications allow business to react quickly to changes in the business without investing in large scale design Real-time integration among and between all key business applications across the organization Flexible plug-and-play integration promotes cross-functional collaboration and enables achievement of business/strategic imperatives Single source of data serves the entire organization providing high data integrity	Use of Machine Learning (ML) algorithms offering mitigation advice and proven routine solutions from the past, when available Use of blockchain to enable visibility and traceability of goods throughout all segments of the supply chain Use of prescriptive analytics and smart Artificial Intelligence (AI) engines as key elements of the planning processes to conduct the analysis, correct the situation and predict the outcomes in a near real-time environment Use of AI/ML to automate complex decisions made across supply chain operations, particularly around optimizing asset utilization, supply and demand in dynamic conditions End-to-end logistics visibility with Track & Trace technologies and systems, i.e. 1) use of RFID and Bluetooth technologies to track movement of items indoors, such as inside factories and warehouses. 2) use of 3D printed readable sensor tags that can be attached to cargo and capture temperature and humidity conditions. 3) use of a Global System for mobile communication (GSM) and satellite tracking in maritime transport, and ship sensors to monitor engine performance

· Process · Partnering · Organization & Skills · Performance Management

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12. APPENDIX C:

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