

# Agile Procurement and its Role in Adding Value

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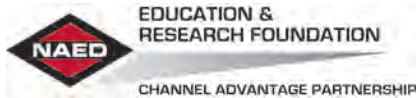
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# Agile Procurement and its Role in Adding Value

This whitepaper examines the use of agile procurement within an electrical manufacturing, distribution, and construction supply chain for the purpose of developing a greater understanding of:

- What services are most widely requested;
- Who is currently charging for added services;
- How these services are being monetized;
- How agile procurement can deliver greater value to manufacturers, distributors and contractors.

## **WHAT'S THE BIG IDEA?**

Partnering and planning can build profitable relationships throughout the industry.

TABLE OF CONTENTS

Executive Summary 1

Introduction 6

Current Practices 9

Case Reviews and Recommendations 13

Methodology and Survey 22

Appendices 27

    Appendix A: Contractor Survey 28

    Appendix B: Manufacturer and Distributor Survey 32

    Appendix C: Survey Results 35

        Manufacturer/Distributor/Contractor Questions

        Manufacturer or Distributor Questions

        Contractor Questions

    Appendix D: Value Added Services Most Commonly Requested 42

    Appendix E: Select Survey Filters 43



# EXECUTIVE SUMMARY

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This whitepaper examines the use of agile procurement within an electrical manufacturing, distribution, and construction supply chain. Agile procurement adds value by engaging all supply chain members in jointly managing the flow of material to create greater efficiency of operations. Funded jointly by the NAED Education & Research Foundation's Channel Advantage Partnership and ELECTRI-International, the Foundation for the National Electrical Contractors Association, this study aims to find a way to eliminate waste and add value to installed electrical materials and equipment.



# What is agile procurement?

➤ The goal of agile procurement is to lower costs by reducing job site material handling and other waste rather than focusing upon reducing the direct cost of materials. In agile procurement, manufacturers, suppliers, distributors, and customers come together to define their common assumptions in terms of the business value, implementation risks, expenses (effort) and costs associated with procurement. An indicative fixed price scope is initially agreed upon, but is not yet contractually binding. This is followed by a test phase. At the end of this phase, suppliers and customers compare the empirical findings with their initial assumptions. Then everyone decides on the procurement implementa-

tion strategy for the entire project. Agile procurement has its basis in Agile Project Management (APM™). APM is an iterative method of determining and developing project requirements in a highly flexible and interactive manner.

Though many contractors believe that having multiple suppliers during the construction stage of a project will better position them to reduce supplier pricing and increase profits, national surveys indicate that contractors may only realize up to a few per cent cost savings using this approach. Contractors who partner with their suppliers, however, can receive supplier services that can reduce contractor material handling time by a significant margin.

Furthermore, in developing a relationship with a preferred provider these specialty contractors need issue only one purchase order for commodity goods, as opposed to multiple orders to numerous suppliers.

NAED and NECA members participated in a survey to gain a better understanding of the approach to materials management, services, and delivery options. Along with the results of this survey, case reviews are presented focusing on opportunities for contractors to utilize manufacturer and distributor value added services. A baseline status of research, along with research steps, questions and milestones, is shown in [Appendix E](#).

## SURVEY RESULTS

### VALUE ADDED SERVICES

➤ The survey results confirm that contractors frequently request several value added services ([Appendix C](#)). Most commonly requested services were analyzed to determine if they were charged as a specific fee or a bundled price with other items/services. Those services were ranked and sorted by the sum of the “bundled price with other services” plus “charged a specific fee” ([Appendix D](#)). Select survey filters, such as “biggest headaches in each region” and “amount decreased by material issues based on Short Interval Scheduling (SIS ®) Success rate, were created ([Appendix E](#)) to further analyze the data.

Each of these services was charged for 50 percent or more of the time. Specific fees were more common than the bundled prices and prove to be a more effective way to realize revenue from these services.

Most common services requested were determined by a measurement of 20% response rate or more; this is summarized in Table 1. Refer to [Appendix D](#) for additional information. Note that this table is first sorted by the most requested category of service (i.e., “Shipping and Receiving”), then by the most requested service within the category (i.e., “Emergency deliveries”).

Specific recommendations are shown below for Distributors/Manufacturers and Contractors. Refer to the *Case Reviews and Transition Roadmap* sections for details. As cited in the *Case Reviews* section, Vendor Managed Consignment Inventory (VMCI) can greatly assist with materials management. As discussed in the Current Status section, co-location of supplier representatives in contractor’s offices will benefit the entire procurement process.

### THE TOP FIVE MOST REQUESTED VALUE ADDED SERVICES, WHERE DISTRIBUTORS RECEIVED COMPENSATION WERE:

- LIGHTING FIXTURE PACKAGING REMOVAL AND PALLETIZATION
- WIRE PARALLELING
- PULLING HEADS
- WIRE & CABLE CUTTING & STRIPPING
- EMERGENCY DELIVERIES



**TABLE 1 – MOST FREQUENTLY REQUESTED COMPENSABLE SERVICES**

**SHIPPING & RECEIVING**

1. Emergency deliveries
  2. Job site delivery
  7. Material Scheduling
  3. Material tracking
  4. Early AM delivery
  5. Staging orders
  6. Coordination of special delivery
  8. Vendor managed inventory
  9. Multiple delivery locations at job site
  10. On-Site containers inventory
  11. Project logistics management
- \*Night delivery to a secured container*

**ORDERING**

1. Co-location of personnel
  2. Repair/return support
  3. Processing rebates or incentives
- \*Warranty*

**WAREHOUSING**

1. Bin restocking for service trucks
- \*Bin restocking for prefabrication*

**OFFICE & ACCOUNTING**

1. EDI invoicing
  2. Summary billing
  3. Price books compatible with estimation software
- \*Warranty*

**JOB SITE MANAGEMENT**

1. Staging at distributor site
  2. Bagged/tagged by area
  3. Staging at job site
- \*Commissioning*

**PRE-INSTALLATION**

1. Lighting fixture package removal & palletization
  2. Wire paralleling
  3. Pulling heads
  4. Wire & cable cutting & stripping
  5. Customized packing or pallet configurations
  6. Sequencing of orders to customer's schedule
  7. Kitting or assembly services
  8. Customized labels & markings
  9. Lighting layout and design
- \*Minor preassembly*

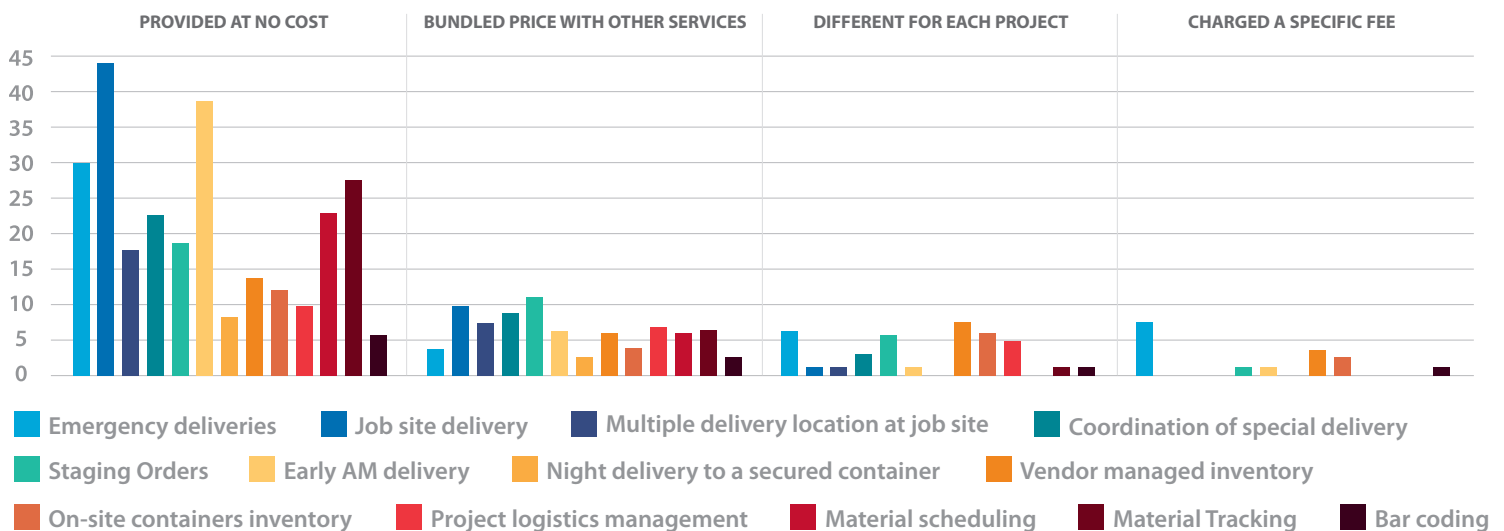
*\*Next request outside 20% threshold*

Note that one of the most critical issues when accepting any additional service is the inherent liability associated with that service; that the liability shifts from the contractor to the manufacturer and/or distributor. There are also concerns with what services may be performed for union shop versus merit shop contractors. Two excellent NAED whitepapers<sup>1</sup> address these issues.

## CHARGING FOR VALUE ADDED SERVICES

➤ While most distributors offer value added services in at least a few areas, our data indicates that very few distributors decide to charge for them. Most who do charge levy the charge as part of a bundle of services and not on a per-service basis as illustrated in the shipping and receiving segment (Figure 1.)

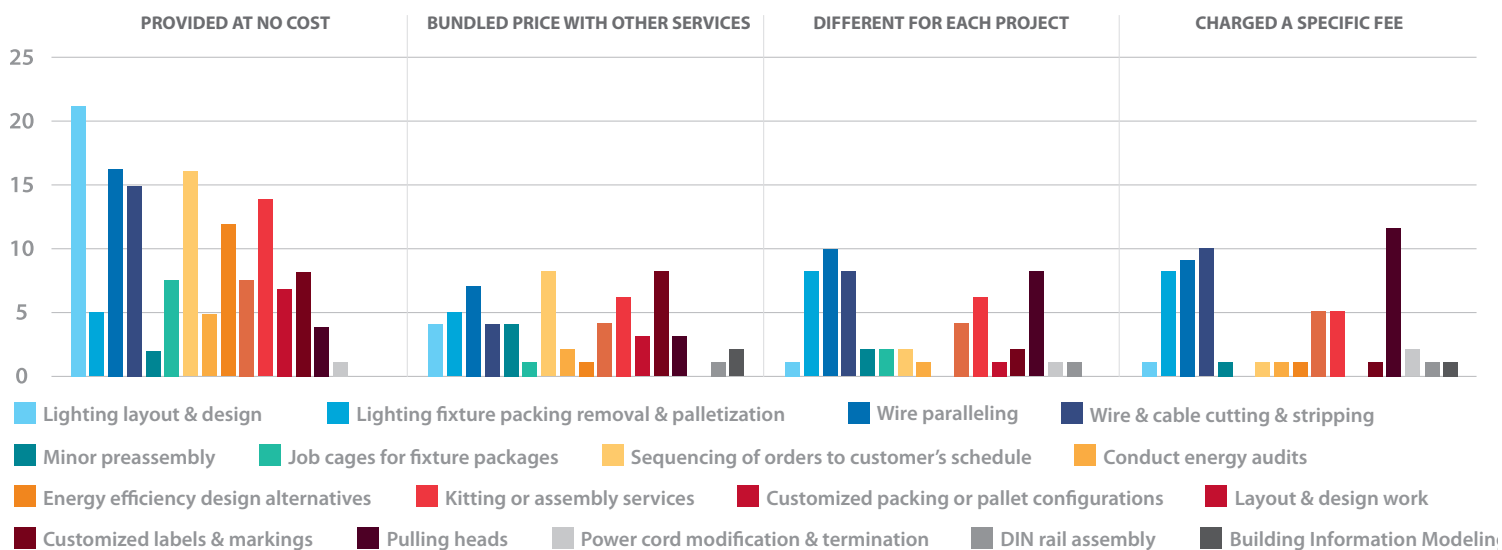
FIGURE 1: BREAKDOWN OF SHIPPING AND RECEIVING SERVICE CHARGES



<sup>1</sup>Heinze, B. G. esq. (2008) "Service Liability Exposure – Navigating the Legal Risks and Protections", published by NAED and NAED whitepaper "Terms and Conditions: Reading the Fine Print (Phase 2)"

Examining charges in one category, in this case Shipping/Receiving Services, the trend toward providing no-cost services becomes clear. This extends across all categories except Preinstallation Services. For services directly related to preparing goods for installation, distributors are far more likely to charge. This may be due to the increased resource requirements or the assumption of risk on the distributor's part (figure 2).

FIGURE 2: BREAKDOWN OF PREINSTALLATION SERVICE CHARGES



It's clear that for distributors to be fully compensated for value added services they need to be able to evaluate their cost for providing each service, on each project, and to selectively charge for this work. Embedding charges for additional services within the cost of doing business does not provide clarity as to the actual costs for these services. There is also the potential for burdening all customers with the same cost basis regardless of whether or not these services are desired.

## DISTRIBUTOR/MANUFACTURER RECOMMENDATIONS

### KNOW WHAT COST YOU CAN CHARGE

➤ With the increase in popularity for value added services comes an inclination to offer them as free added benefits to contractors. This isn't always the best option. Know what services you can offer for free based on your competitor's offerings, and don't hurt your bottom line by offering services that cost you.

### ENCOURAGE CONTRACTORS TO WORK CLOSELY WITH YOU

➤ An Agile model requires distributors and contractors to remain in sync. While contractors are naturally inclined to shop for the lowest price on goods and move among a variety of different suppliers; this leads to higher PO costs for the contractor, and takes business away from you, the distributor.

### PROVIDE FORECASTING AND PRODUCT AVAILABILITY TOOLS

➤ Contractors lose time and money for each PO that is filed and received. Distributors that provide for, and assist with, forecasting can make reduce a contractor's lost time and build a better relationship.



## CONTRACTOR RECOMMENDATIONS

### STOP SHOPPING WITH MULTIPLE DISTRIBUTORS FOR MATERIALS

➤ While it may seem foolish to not search for the best price on materials, it's actually hurting you in the long run. Working with one or two distributors makes it easier to track and source items in the supply chain and avoid confusion. One electrical contractor in California has two distributors co-located in their office and receives quotes from both to ensure they are receiving favorable pricing. Over time, orders are distributed to both distributors.

For example, the average contractor files about 25 POs per project for materials. Depending on the project and the number of suppliers involved, this may seem reasonable. However, agile can help bring these numbers down. Those working on larger projects can expect to realize even greater savings as they slim down their ordering processes.

**RECOGNIZE, HOWEVER, THERE ARE INDUSTRY DYNAMICS THAT SERVE AS BARRIERS TO THIS APPROACH, INCLUDING:**

#### **VENDOR/PRODUCT EXCLUSIVITY**

Exclusivity strategies often hinder distributors from holistically fulfilling a bill of materials that have hard specified products

#### **SUPPLIER PROTECTION**

Upstream channel partner protection of some distributors with a 'low bid' approach often impacts the potential cost savings

### IMPLEMENT VALUE ADDED SERVICES IN KEY AREAS

➤ Distributors offering value added services can complete many processes on the jobsite that take extended periods of time and labor. Popular ordering and preinstallation services utilized by other contractors can be used to reduce expense and time.

Agile practices bring benefits to organizations at all points of the supply chain, but work best when contractors and distributors can coordinate directly on which services each provides. Contractors working on a jobsite often spend valuable man-hours on simple tasks that could

easily be completed by the distributor offsite for much less money. Likewise, distributors often lose out on providing lucrative services that aid the contractor. Provided below are roadmaps for both distributors and contractors to integrate these services.

### KNOW YOUR SUPPLY CHAIN PERFORMANCE INDICATORS AND MONITOR THEM

➤ Most contractor-side supply chain benefits involve the ability to have parts onsite quickly and without the hassle of handling issues. Since the real savings for electrical contractors comes from the reduction of materials handling issues, attention should be paid to monitor and curtail these issues. Moving to a single supply chain partner makes for a simplified, streamlined chain where fewer orders get mixed up or lost. Assuming approximately 25 POs per project

(on average) and the cost to generate/process a PO is \$50<sup>2</sup>. Material ordering/receipt/handling issues typically add 1-5 hours per PO (Appendix C). Using a loaded

**The sum of processing and correcting PO material issues is approximately**

**\$6,125** per project

hourly wage rate of \$65/hour (Daneshgari 2015) and estimating three hours are typically lost per PO, yields \$4,875 lost due to material issues. The sum of processing a PO plus correcting PO material issues is therefore approximately \$6,125 per project. Note that this represents only the direct cost savings; there would be additional consequential costs. A Vendor Managed Inventory (VMI) approach would recoup these costs.

### WORK TO ANTICIPATE YOUR PROJECT REQUIREMENTS

➤ Many contractors fall victim to last-minute part needs that are costly and difficult to fulfill. A streamlined supply chain can help fill these more quickly and reduce time spent waiting on materials to arrive.

<sup>2</sup>This compares favorably with industry data (Daneshgari 2015) of \$42/PO. The survey data therefore yields approximately \$1,250 in average PO costs.

# INTRODUCTION

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## ELECTRICAL DISTRIBUTION AND CONSTRUCTION

*Developing an Agile Supply Chain Partnership*



## BACKGROUND

> This whitepaper examines the use of agile procurement within an electrical manufacturing, distribution, and construction supply chain. Agile procurement adds value by engaging all supply chain members in jointly managing the flow of material to create greater efficiency of operations. The goal of agile procurement is to lower costs by reducing job site material handling and other waste rather than focusing upon reducing the direct cost of materials. In agile procurement, manufacturers, suppliers, distributors, and customers come together to define their common assumptions in terms of the business value, implementation risks, expenses (effort) and costs associated with procurement. An indicative fixed price scope is initially agreed upon, but is

not yet contractually binding. This is followed by a test phase. At the end of this phase, suppliers and customers compare the empirical findings with their initial assumptions. Then everyone decides on the procurement implementation strategy for the entire project. Agile procurement has its basis in Agile Project Management (APM™). APM is an iterative method of determining and developing project requirements in a highly flexible and interactive manner.

Though many contractors believe that having multiple suppliers during the construction stage of a project will better position them to reduce supplier pricing and increase profits, national surveys indicate that contractors may only realize

up to 2 percent cost savings using this approach. Contractors who partner with their suppliers, however, can receive supplier services that can reduce contractor material handling time by up to 40%. Furthermore, in developing a relationship with a preferred provider these specialty contractors need issue only one purchase order for commodity goods, as opposed to multiple orders to numerous suppliers (Daneshgari 2010). The results of a survey of supply chain members are presented, along with a case review approach, focusing on opportunities for contractors to utilize manufacturer and distributor value added services. A baseline status of research, along with research steps, questions and milestones, is shown in [Appendix E](#).

### AGILE STATS



Contractors reduce material handling time by up to

# 40%

when partnering with supplier

## AGILE MANAGEMENT AND CONSTRUCTION

> Agile project management™ (APM™) was developed in 2011 in the software industry. An agile methodology is more flexible, efficient, and team-oriented than previous project management models (Ambler 2012). Agile is based upon iterative and incremental development where requirements and solutions evolve through collaboration between self-organizing and cross-functional teams. Compared with a conventionally structured

sequential Project Management Institute (PMI) approach (Royce 1970), APM™ reportedly delivers defect rate improvements (Bowers 2002) and better, or significantly better, quality (Shine 2003). In a broader sense, an agile approach to construction also includes all additional project stakeholders during construction, including manufacturers, distributors, suppliers, and all specialty contractors, including electrical contractors.

**“Agile construction® is an engineered process designed to respond to the owner’s and general contractors’ specific needs to become more efficient, more productive, and ultimately, more profitable.”**

DANESHGARI (2010)



## AGILE & LEAN

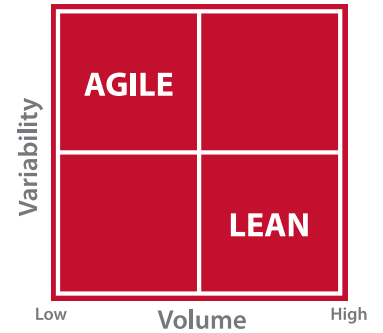
➤ Lean and agile paradigms, though distinctly different, can be combined within successfully designed and operated supply chains (Mason-Jones 2000). Lean supply chain management focuses upon reducing costs and lowering waste as much as possible. This approach is beneficial for organizations with high volumes of POs since waste and costs can accumulate quickly. It is also productive for companies with high volumes of low variability POs. Agile supply chain management, however, is structured to be highly flexible and able to quickly adapt to changing situations. This methodology is considered important for organizations that need to respond to unanticipated external changes, such as changes in

customer demand. An agile supply chain allows organizations to quickly adjust their sourcing, logistics, and sales. Agility is needed in less predictable environments when volume is low and variability is high (Figure 3) (Lim 2014).

Differentiated from lean production, agile techniques focus on how to respond or adapt to constant changes in an unpredictable environment (Dove 1996; Sanchez 2001). This is accomplished through well-established and maintained relationships between the customer, distributor, and suppliers as well as a win-win system of cooperation within a manufacturing organization (Deming 1982). The APM™ approach is highly

dependent on collaboration: APM™ working practices focus on frequent, sustainable, iterative deliveries by multi-functional, intercommunicative teams.

FIGURE 3: AGILE VERSUS LEAN





## CURRENT PRACTICES

### CURRENT STATUS

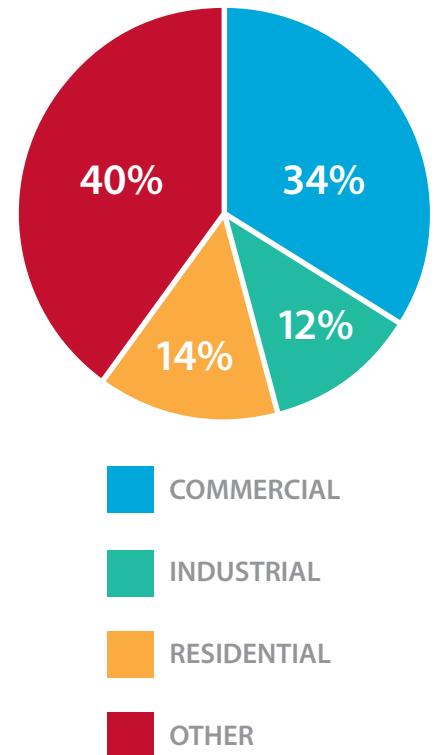
➤ The electrical supply and distribution industry is rapidly changing due to advances in data gathering, distribution, and real-time analysis. For example, LEDs, which last years longer than florescent lights and use only a fraction of their power, are expected to replace some 50 million aging light bulbs worldwide over next few years (Cardwell 2015). While some companies and cities are mainly concerned about saving energy and money, others are looking to reap benefits beyond illumination.

Sensity Systems, a silicon-valley startup, builds and manages smart-lighting networks that enable owners to capitalize on the LED conversion process by embedding sensing and networking technology within both retrofit and new LED installations. They are partnering with an LED manufacturer to develop lighting systems with motion sensors that will help both building owners, as well as cities, save electricity by turning lights on and off automatically as people walk or drive-by. Stores in malls and shopping centers can use the technology to send sales messages to their shopper smartphones, and cities can ease congestion on roads by alerting drivers to traffic jams and sensing when municipal garbage need to be emptied. Also, sensors in parking lot lights can track when cars leave and alert other shoppers to empty spots.

In order to provide insight for electrical contractors to better assess the value added by aligning with, and having added services provided by a single supplier, electrical distributors need to accurately quantify their organizations' total cost to provide these additional services. However, the cost of these services is often hidden since the resources needed to provide them are considered to be part of a distributor's sunk costs; these services are also routinely aggregated with material, thereby masking the distributor's cost of services. According to NECA, a typical electrical contractor has 42% of their revenue devoted to labor, and 40% of that labor goes to material handling; yielding approximately 17% of project revenue associated with material handling (Daneshgari 2010). An Agile Procurement™ process would assist all participants in the supply chain to decrease waste, increase efficiency, and improve costs.

In a recent NAED survey, 60% of the NAED respondents identified Residential, Commercial, and Industrial Electrical Contractors, collectively, as the clients with whom they conduct the most business (Figure 4). "Other" includes Institutional, Utility, Government, and Maintenance and Operations (M & O). The survey was developed to create a benchmark of

FIGURE 4: CLIENTS WITH WHOM NAED MEMBERS CONDUCT BUSINESS



the value added services that electrical distributors are currently offering. This benchmark will serve as a starting point to develop a roadmap for offering new services in the future. By using Agile Procurement™, electrical distributors and contractors, in a partnering arrangement, can jointly manage the flow of material and create greater efficiency of operations.

### AGILE STATS



# 42%

of electrical contractors revenue is devoted to labor.

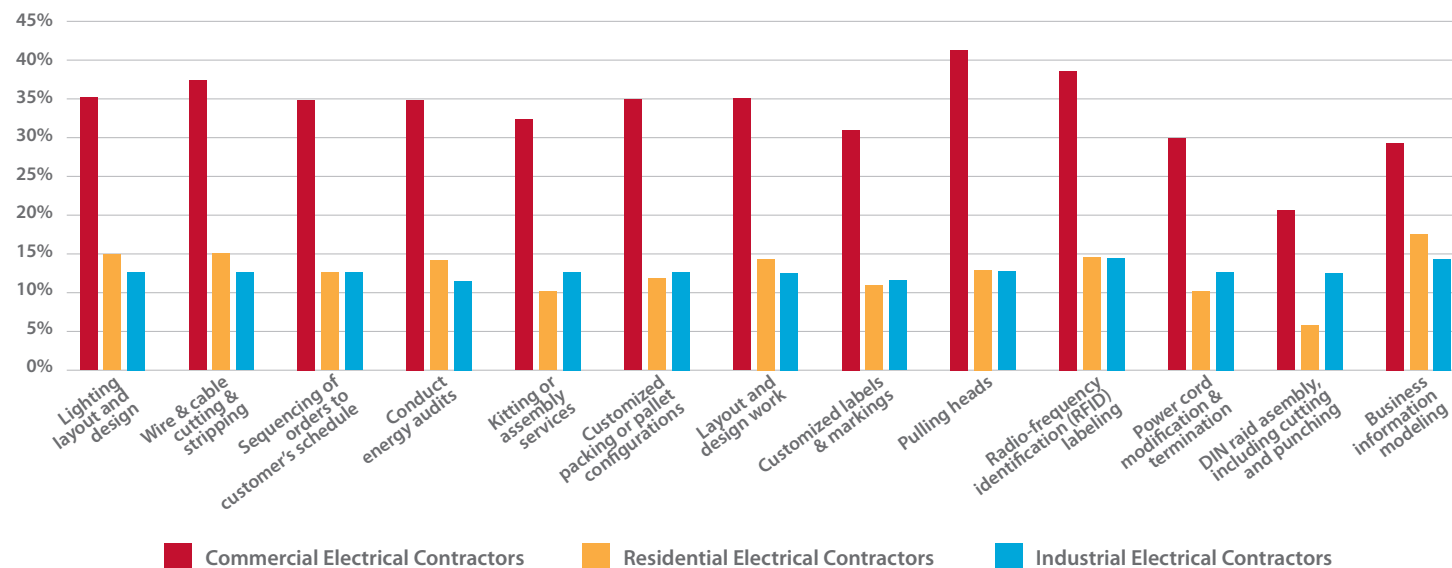
A comparison of types services offered to category of customer is shown in Table 2 and Figure 5.

**TABLE 2 - COMPARISON OF SERVICES OFFERED TO CATEGORY OF CUSTOMER**

Services Offered	Commercial Electrical Contractors	Residential Electrical Contractors	Industrial Electrical Contractors	Original Equipment Manufacturer	Maintenance, Repair & Operations	Institutional (i.e. Hospitals/Schools)	Utility	Government	Other
Lighting layout and design	35.4%	14.7%	12.4%	11.9%	9.8%	5.7%	3.7%	4.3%	1.9%
Wire & cable cutting & stripping	36.5%	15.0%	12.4%	11.4%	9.9%	5.5%	3.6%	4.1%	1.6%
Sequencing of orders to customer's schedule	34.8%	12.9%	12.9%	12.6%	10.7%	5.9%	3.9%	4.6%	1.8%
Conduct energy audits	35.3%	14.1%	12.4%	12.6%	9.9%	6.1%	3.1%	4.8%	1.8%
Kitting or assembly services	32.7%	10.4%	12.9%	16.1%	12.2%	5.6%	3.9%	4.6%	1.5%
Customized packing or pallet configurations	34.6%	12.5%	12.7%	13.9%	10.9%	5.4%	4.2%	4.0%	1.7%
Layout and design work	34.3%	14.2%	12.5%	13.6%	10.5%	5.6%	3.5%	4.0%	1.8%
Customized labels & markings	31.5%	11.2%	11.9%	17.1%	12.1%	5.7%	4.2%	4.4%	1.8%
Pulling heads	41.5%	13.0%	13.2%	9.3%	8.4%	5.2%	4.1%	3.9%	1.3%
Radio-frequency identification (RFID) labeling	37.6%	14.3%	13.7%	10.5%	8.1%	5.2%	6.2%	3.5%	1.0%
Power cord modification & termination	30.3%	10.6%	13.3%	16.0%	15.6%	5.6%	3.5%	3.5%	1.6%
DIN rail assembly, including cutting and punching	21.9%	5.7%	13.3%	29.9%	16.6%	4.4%	3.3%	2.5%	2.3%
Business Information Modeling	28.5%	16.9%	14.6%	13.5%	9.6%	6.4%	5.0%	3.1%	2.3%
<b>Total</b>	<b>33.9%</b>	<b>14.2%</b>	<b>12.4%</b>	<b>14.1%</b>	<b>10.5%</b>	<b>5.2%</b>	<b>3.6%</b>	<b>4.0%</b>	<b>2.0%</b>

Table 2 NAED prior survey reference to "Business Information Modeling" shown above refers to "Building Information Modeling"

**FIGURE 5: SERVICES OFFERED TO COMMERCIAL, RESIDENTIAL, AND INDUSTRIAL ELECTRICAL CONTRACTORS**



➤ In the same survey, 37% of the respondents stated that the reason they do not charge for value added services is “that market conditions dictate that we can’t start charging.” Furthermore:

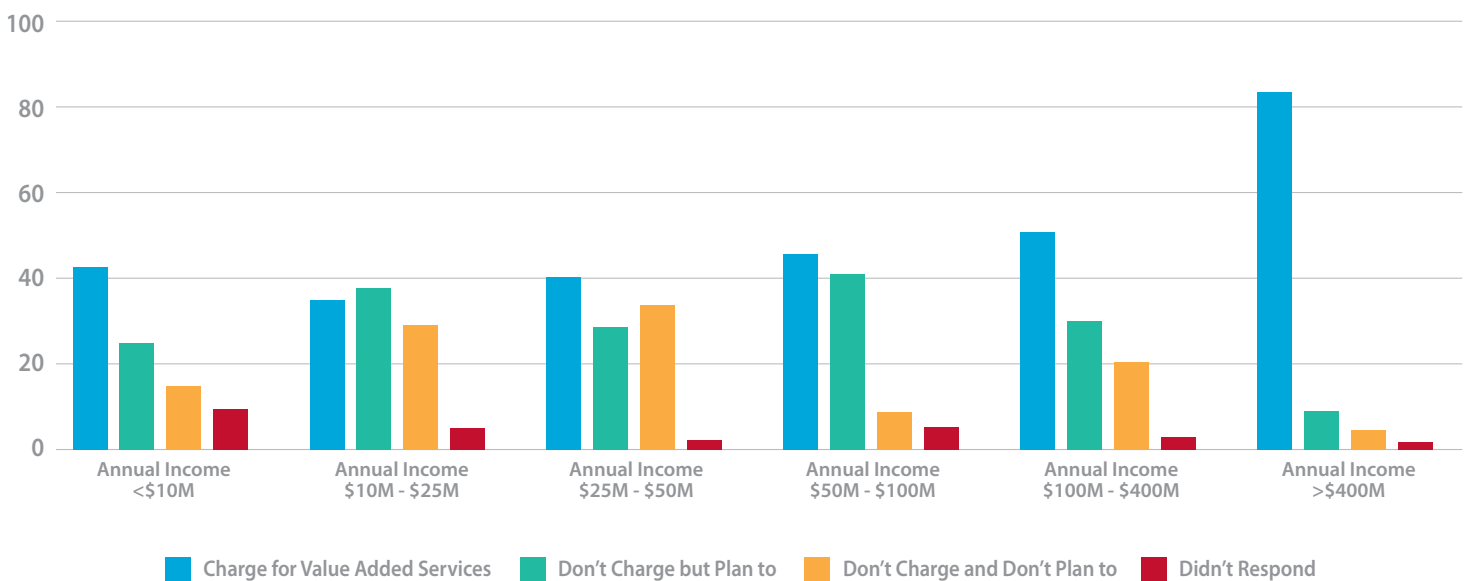
**55% of respondents don’t have a separate budget for services provided**

**54% currently charge for value added services**

**27% do not, but plan to in the future**

The survey data was requested and analyzed with respect to the last two values; companies that currently charge for value added services and those who do not but plan to in the future. These values were examined with respect to company revenue (Figure 6). The data indicates that less than 50% of the 177 companies with annual revenue of less than \$400M currently charge for value added services whereas 84% of 45 companies with annual revenues greater than \$400M currently charge for these services.

FIGURE 6: NAED MEMBER COMPANY REVENUE AS A FUNCTION OF COMPANIES CHARGING FOR VALUE ADDED SERVICES



The survey results (shown in [Appendix C](#)) provide detailed information as to those specific services that are currently provided, along with the associated compensation.

Agile practices may be graphically shown to aid in improving the procurement process among supply chain partners by examining process diagrams. A conventional material flow diagram for electrical materials that could be used to prefabricate assemblies might be similar to that shown in Figure 7.

FIGURE 7: SAMPLE MATERIAL FLOW DIAGRAM FOR AN ELECTRICAL PREFABRICATED ASSEMBLY

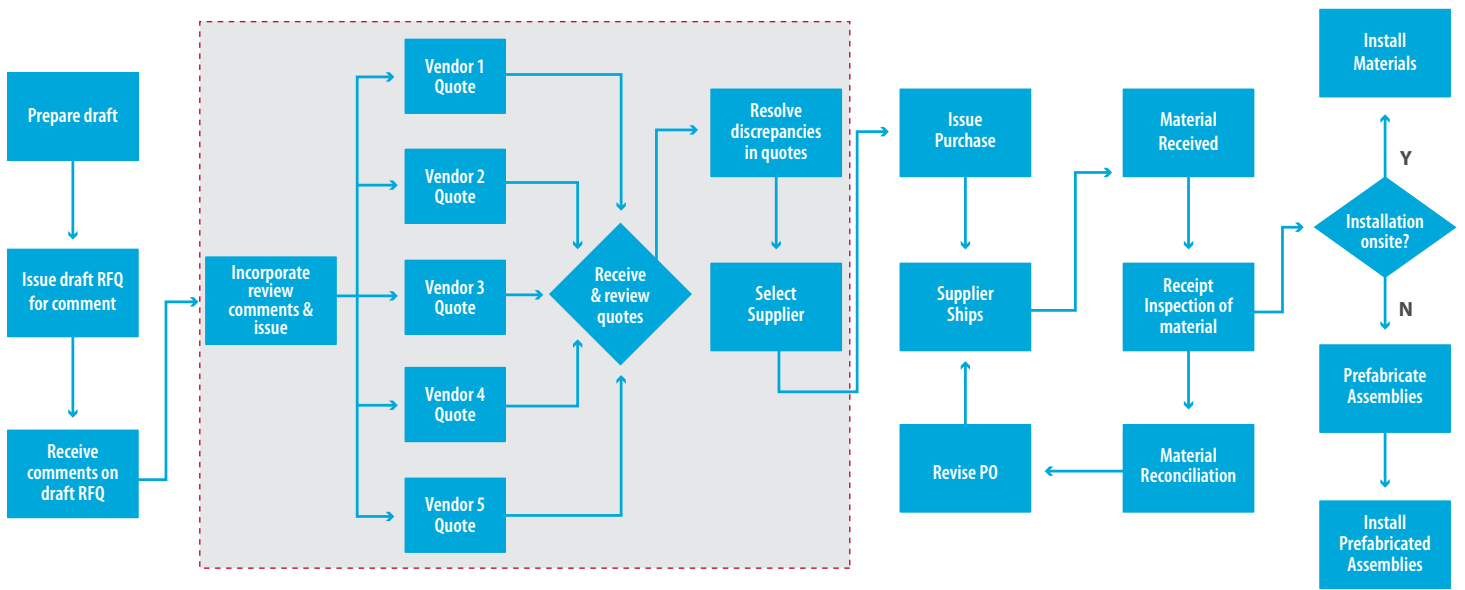
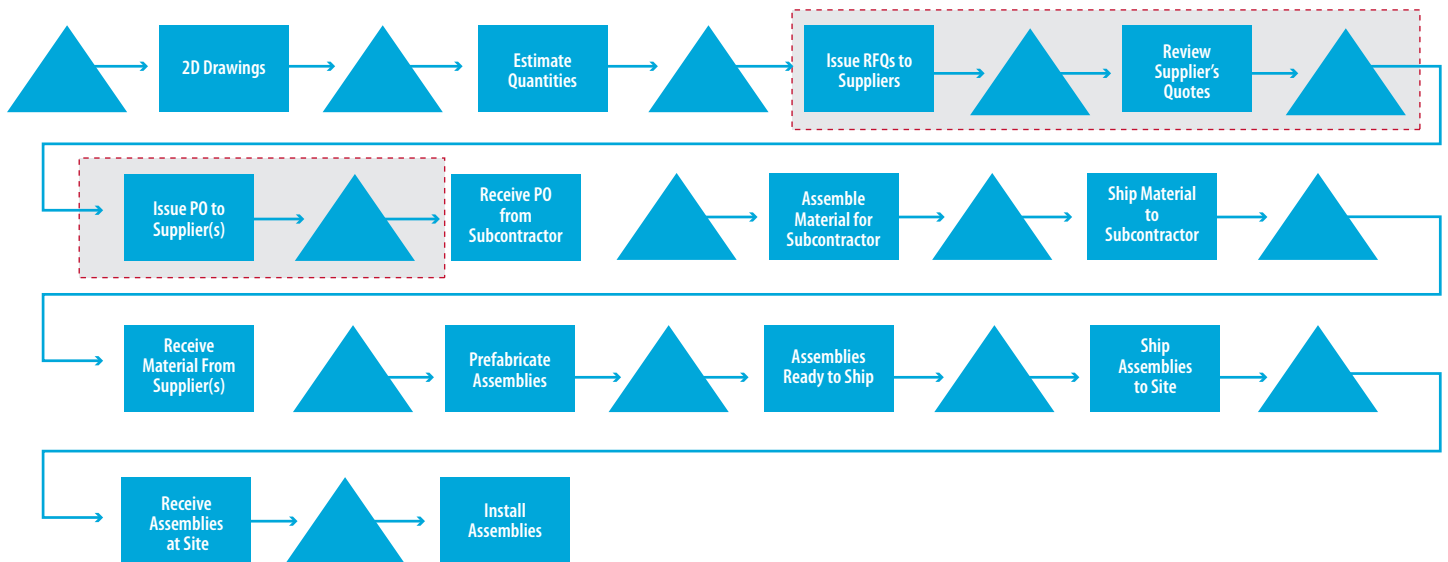


FIGURE 8: SAMPLE VALUE STREAM MAP FOR AN ELECTRICAL PREFABRICATED ASSEMBLY



Note that there is considerable time and effort expended on those steps shown shaded, which involve quotes from multiple vendors. By incorporating an agile approach of co-locating one or two selected suppliers within an electrical contractor's office, these steps, and their associated time, may be significantly reduced. Similarly, a value stream map for the same process might be similar to that shown in Figure 8.

The activities and queue times for procurement on those steps shown shaded may be similarly reduced as well.



# CASE REVIEWS & RECOMMENDATIONS

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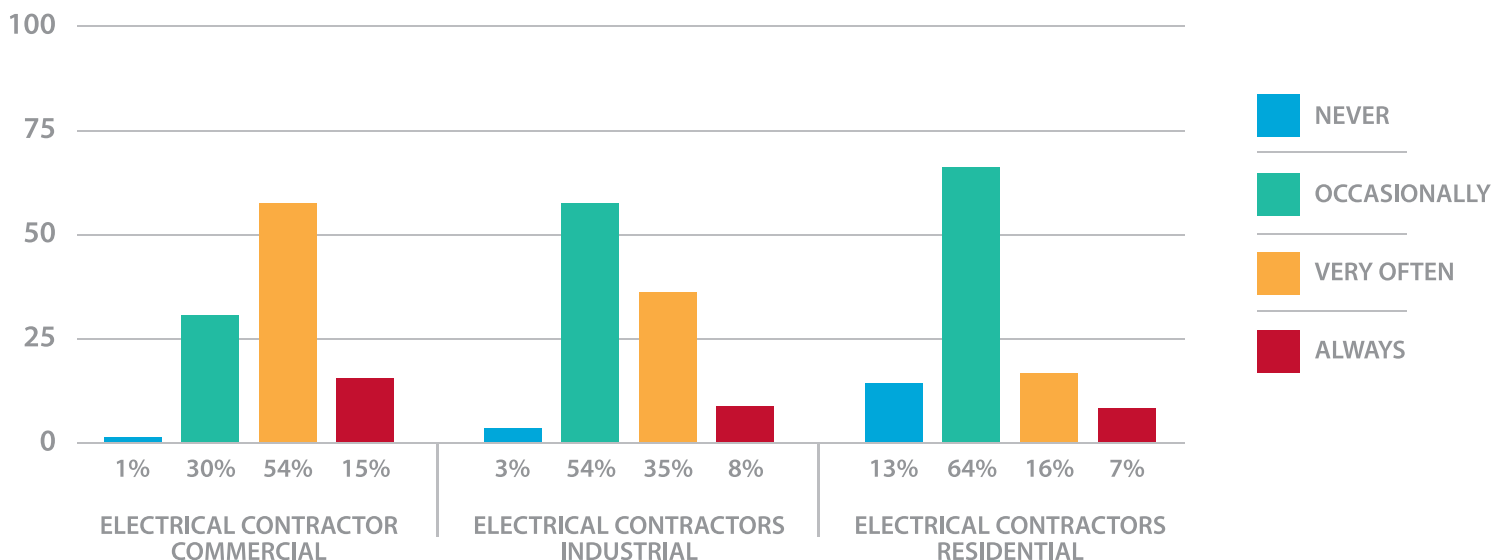
ELECTRICAL DISTRIBUTION AND CONSTRUCTION  
*Developing an Agile Supply Chain Partnership*



## REASONING

➤ Cases were solicited to describe how electrical contractors have adopted Agile Procurement™ and applied this process to help reduce job labor costs. For example, Daneshgari cites that one electrical contractor in the NAED South Central region reduced labor costs by more than 30% on three different industrial plants under the same ownership by utilizing a wide range of agile incorporation (from 0% to 100%). One focus of the case reviews was to examine opportunities for supplier and distributor value added services (Figure 9).

FIGURE 9: FREQUENCY OF VALUE ADDED SERVICE REQUESTS FROM CUSTOMERS (NAED)



Specifically, do the 54%, 35%, and 16% “Very Often” value added service requests for commercial, industrial, and residential electrical contractors (respectively) accurately reflect the current state of the industry? If so, what opportunities are available for expanding these services?

From all case reviews it was clear that distributors can play a greater role in helping electrical contractors select the correct materials and manufacturers, that align with project needs and price points, to achieve project success. Electrical contractors should use selection criteria to choose a

Vendor Partner with shared pricing (open book) information to the distributor to allow the distributor to assist in the material selection and flow process. Distributors need to ensure that they have adequate resources and employees with the correct skill sets to add value to this process.

### EXCESS INVENTORY WHEN THE JOB IS OVER

#### MUCH LABOR IS LOST AT THE CONCLUSION OF EACH PROJECT BY:

- collecting materials from the job
- transferring these materials to the electrical contractor’s shop
- sorting the materials
- restocking the materials

The cost benefit of turning that process over to a distributor through consignment inventory should be thoroughly examined, as should allowing a distributor to take over the role of the entire clean-off process. This is a great selling tool for distributors to gain loyalty and business from contractors, saving contractors a significant amount of money.

## CASES

> Four cases were identified for review

**Walmart Distribution Center in Maine**  
**University Hospital in Texas**  
**Harrison County Schools**  
**Charles County Schools (retrofit) in Maryland**

Project cost information is included, however, specific cost savings associated with value added services is not listed, as this information is considered proprietary and confidential. Both contractors and distributors provided case study data.

### 1 THE LAST CASE REVIEW WAS THE CHARLES COUNTY MARYLAND SCHOOLS (RETROFIT) PROGRAM:

- > Contractor Requirements.
  - Execute to end-customer requirements.
  - Adhere to 24 school retrofit schedule during a two-month summer period.
  - Zero impact on school opening.
  - Manage multiple contractors.
- > Manufacturer/Distributor Solutions.
  - Managed all products in regional manufacturing center with 1–2 days shipment lead time.
  - Hosted weekly calls to facilitate communication of scheduling requirements.
  - Initiated contractor calls for each shipment with date and specified times.
  - Initiated contractor calls on days of delivery to ensure schedule closure.

### 3 THE HARRISON COUNTY SCHOOLS PROGRAM INCLUDED MULTIPLE SCHOOL SITES WITH THE FOLLOWING CONTRACTOR AND MANUFACTURER/DISTRIBUTOR ATTRIBUTES:

- > Contractor Requirements.
  - Specified delivery times.
  - Full truck-loads.
  - Advanced notice of truck contents.
  - Customer specified quality.
- > Manufacturer/Distributor Solutions.
  - Utilized manufacturing and rapid response in both regional manufacturing and distribution center to achieve required product mix, truckload, and dates.
  - Single carrier for consolidation and inspection prior to shipping.
  - Sequenced loading of each truck provided in advance of shipment (in both list and photo form).

### 2 ANOTHER CASE REVIEW PROJECT WAS A UNIVERSITY HOSPITAL IN TEXAS; KEY FEATURES INCLUDED:

- > Value Added Basis-Material Management and Logistics Support Vendor.
- > Leveraged expertise in inventory management, delivery logistics, and storage facilities.
- > Furnished adequate facilities to warehouse materials.
- > Acted as local agent to review, receive, inspect file claims, reconcile, and performed receipt inspection of ALL vendor deliveries.
- > Expedited deliveries as required, warehouse, organized, and pulled/staged material.
- > Managed jobsite delivery, palletized/kitted as required, delivery material to jobsite as needed when/where needed, provided personnel to breakdown pallets.
- > Provided forklifts and coordinated crane lifts as need on-site.
- > \$600M facility, \$70M of electrical work.
- > Urban setting, little or no laydown area.
- > Patient Tower and Central Utility Plant.

### 4 THE WALMART DISTRIBUTION CENTER IN MAINE INCLUDED THE FOLLOWING PROCUREMENT APPROACH:

- > Vendor Managed Consignment Inventory (VMCI).
  - On-site storage trailers to be stocked and restocked on a weekly basis.
  - Only stock removed for installation would be billed.
  - Returns would be accepted for stock in good condition, no restocking fee.
  - Prices fixed for the duration of the project, or tied to a commodities index.
- > 1M square foot facility.
- > Three-stage, phased project.
- > \$10M in electrical materials.

## DISTRIBUTOR/MANUFACTURER RECOMMENDATIONS

### COLLABORATION WITH CONTRACTORS

➤ Because distributors work in a contractor-focused industry, the most useful data on their business goals comes from contractor evaluations of their supply chain needs. Revisiting the primary supply chain headaches for contractors, we see that the most pressing issues are forecasting, communication, and critical

product availability. Distributors should focus on helping meet these needs.

Key advantages to distributors for entering into contractor partnerships are related to increased loyalty and ability to promote value added services as solutions to common problems. When compared to con-

tractor evaluations of their relationships, distributors were, on average, less positive about their interactions. They were more likely to rate collaboration on supply issues as fair or poor, especially in “forecasting” and “parts shortages/capacity issues”. Forecasting is consistently ranked highly by both groups (Figures 10 and 11).

FIGURE 10: CONTRACTOR RELATIONSHIP EVALUATION

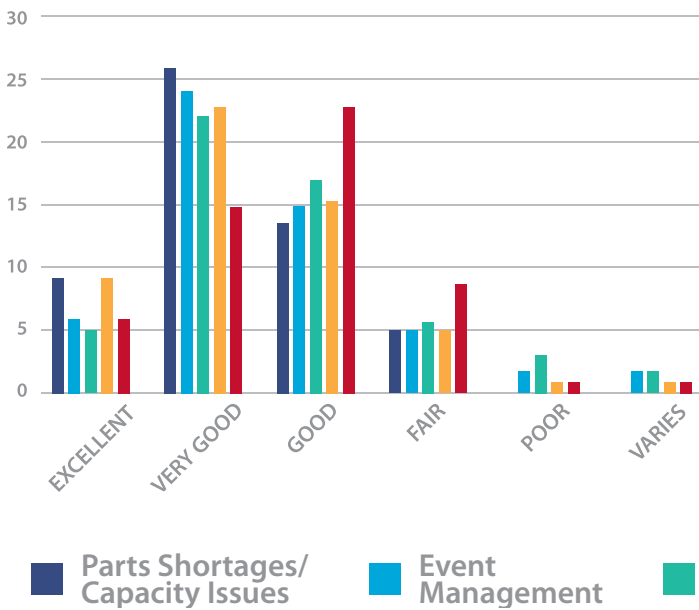
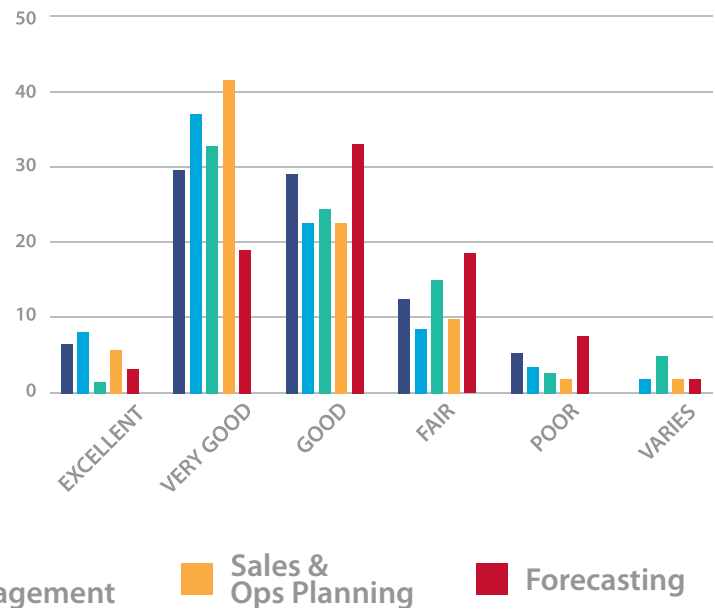


FIGURE 11: DISTRIBUTOR RELATIONSHIP EVALUATION



### AGILE PARTNERSHIPS FOR DISTRIBUTORS/MANUFACTURERS

➤ For distributors and manufacturers, building agile partnerships with contractors should focus on meeting current needs and anticipating future ones. Most contractors have at least 50 purchase orders (POs) per project (some have hundreds or more). Developing closer relationships with contractors discourages price-shopping and complex ordering

schemes. This in turn may reduce PO receiving time. Most contractors estimate they spend 1–5 hours per PO correcting order-handling issues, a factor that results in significant lost time and money.

The majority of contractors estimate their Short-Interval Scheduling (SIS®) success rates are heavily impacted by materials

handling and availability issues. Results indicated that 58% could attribute a negative impact of at least 5% on their success rate based solely on materials handling. Contractors may be correcting last minute oversights on long lead items, contributing to this issue. Distributors can see increased value by providing products and services that reduce scheduling impacts.



## INTEGRATING VALUE ADDED SERVICES FOR CONTRACTORS

➤ Suppliers have opportunities to strengthen the supply chain by offering different types of value added services to contractors. Often, these additional services provide opportunities for increased distributor revenues.

To assist with forecasting issues, many distributors now provide product training and education (67%), technical assistance (53%), price books compatible with estimation software (36%), and weekly materials summaries (31%). These tools may help contractors determine which products meet their needs best and estimate future consumption.

While parts shortages can also be avoided by improved forecasting, many distributors offer other services that can reduce these

shortages. Results indicate that many offer services like emergency deliveries (83%), vendor managed inventorying (55%), and material scheduling (50%). Given the wide range of available services, parts shortages, alone, represent an area where increased collaboration could result in significant gains.

From Table 1, certain categories of services are offered more often than others. Ship-

ping and Receiving (11), and Preinstallation (9) were the most frequently requested compensable services. Together, there were 20 services cited where the sum of the bundled price plus charged a specific fee was greater than 20%. Ordering, Office and Accounting, Job Site Management, and Warehousing offer many opportunities collectively, but fewer than Shipping and Receiving by itself.

AGILE STATS

**83%**

of distributors offer emergency deliveries as additional services



## DISTRIBUTOR ROADMAP

### EVALUATE WHAT SERVICES YOU CAN OFFER

➤ For the distributor, it's important to ensure that any services you plan to offer aren't resulting in losses. While it may be tempting to provide services at no additional cost to the contractor to increase loyalty, moves like these can impact your bottom line.

### MAKE CONTRACTORS AWARE OF YOUR SOLUTIONS

➤ Have a dialogue with contractors about the services you can offer them. While you can benefit from providing these, ensure that they understand that the greater benefit from your services is the reduced costs they'll face.

### BE AWARE OF AREAS WHERE ADDITIONAL SERVICES CAN BE INTEGRATED

➤ Contractors in your region likely face a unique set of challenges. Know these challenges and look for opportunities to introduce services that can be beneficial in your market.

When distributors begin to offer and charge for value added services, both sides benefit. The supply chain can architect solutions to common contractor problems together. Contractors, even when paying for value added services, save money over having to perform the work themselves. As the supply chain recognizes additional needs, problems can be solved quickly and efficiently in ways that greatly reduce cost.

## RECOMMENDATIONS BY REGION AND FIRM SIZE

➤ For this section, we've constrained our analysis to assume that small distributors are generally dealing with small contractors (and so on). It's easier to tailor distributor services to the needs of the contractor than make recommendations based on their size alone.

The recommendations are based upon the following ranges: SMALL (<\$50M), MEDIUM (\$50–200M), and LARGE (>\$200M) and geographical areas: Western (West of the Rockies), South Central (including the Midwest), and Eastern (seaboard, from Maine to Florida, and including Ohio, Pennsylvania, and New York). Note that these regions were specifically chosen to align ELECTRI with NAED established boundaries.

### DISTRIBUTORS

#### Western Region

##### SMALL

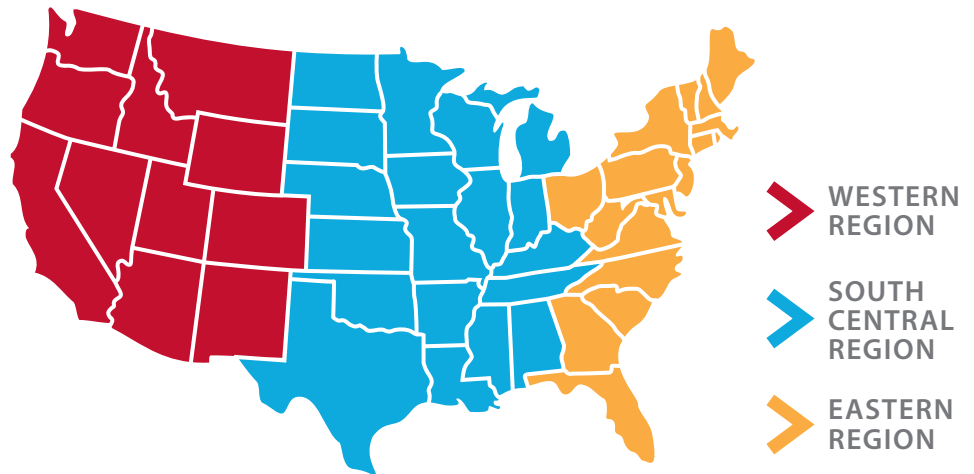
Small contractors in the West report their primary supply chain issues result from time spent placing and receiving orders. Provide resources and services that allow customers to easily decide on parts and estimate pricing. Become familiar with customer's projects to aid in avoiding last minute procurement. Encourage greater communication between both groups in order to reduce confusion and time loss in the supply chain.

##### MEDIUM

Medium contractors in the West face issues with site storage space and product forecasting. Work directly with these suppliers to help them better forecast their needs, encouraging adoption of agile techniques when beneficial. Offer services that increase jobsite delivery flexibility (early morning or night delivery) so that parts are replenished quickly when space is available. Consider providing storage and staging space at your location if possible.

##### LARGE

Large contracting enterprises in this region primarily suffer from forecasting and communications issues. Provide services that give contractors better information to make business decisions and encourage agile techniques to increase supply chain communication.



#### South Central Region

##### SMALL

Critical product availability is most important to small contractors in this region. Product availability challenges are directly related to forecasting and communication issues. The earlier a contractor can communicate needs, the faster a supplier can respond. Make sure that you provide ordering services where contractors can take advantage of these services.

##### MEDIUM

Medium contractors in this region face the same issues as smaller ones.

##### LARGE

No contractors met these criteria; see recommendations for large firms in the other regions.

#### Eastern Region

##### SMALL

Product availability was the largest issue for contractors in this region. See recommendations for South Central Region.

##### MEDIUM

Forecasting and communication were the largest issues in this region. See recommendations for South Central Region.

##### LARGE

Contractors in this region reported their biggest headache came from jobsite storage availability. Offer services that make jobsite restocking easy and convenient on a needs basis.

## CONTRACTOR RECOMMENDATIONS

### PROBLEMS FACING CONTRACTORS

➤ According to the results of our survey ([Appendix E](#)), the biggest supply chain headache facing contractors comes from issues faced in forecasting and communication. The second largest issue facing contractors is critical product availability, or supply chain issues that can be aided by increased communication and regular goal assessment – both foundational features of an agile model (Figure 12).

FIGURE 12: LARGEST SUPPLY CHAIN HEADACHES FOR CONTRACTORS

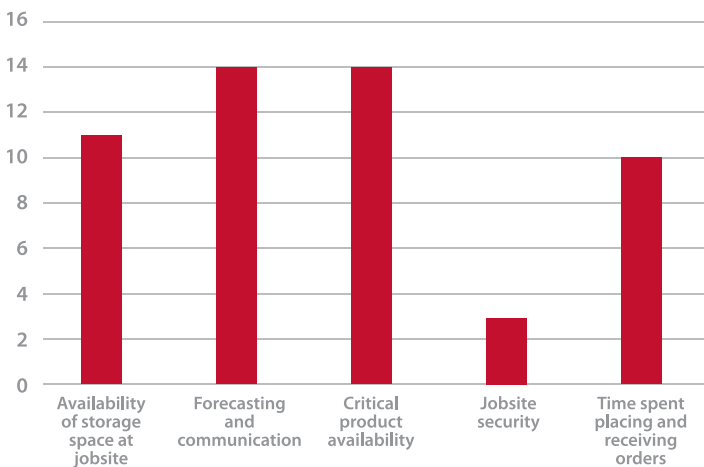
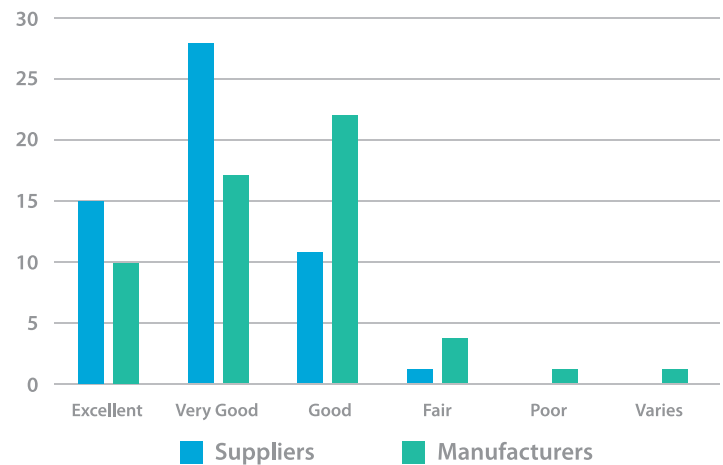


FIGURE 13: CONTRACTOR RELATIONSHIP WITH SUPPLIERS AND MANUFACTURERS



Contractors report that their relationships with manufacturers and distributors are strongly favorable. Contractors often report very good or even excellent relationships. Since one of the core tenets for building an agile supply chain is cross-collaboration between partners, this data indicates that the foundations for such an implementation are already in place.

### HOW AGILE CAN HELP

➤ While contractors report their relationships with manufacturers and distributors are positive, there are some areas where agile practices could reduce issues impacting business operations. PO processing is a core area where an agile implementation can benefit contractors. The majority of contractors process from 25–250 separate purchase orders per project ([Appendix C](#)). Sixty percent of contractors estimate that it takes at least an hour per PO to correct these material ordering/receipt/handling issues, with some admitting that it typically takes more than 10 hours per PO ([Appendix C](#)). Adoption of an agile model can reduce not only the number of POs filed, but also reduce the time spent correcting issues associated with material receipt.

Material handling issues represent a major detriment to contractors. Of those reporting a negative impact to their planned versus actual

Short Interval Scheduling (SIS®) success rates, 58% estimated their success rate was negatively impacted by at least 5% due to such handling problems. One quarter of respondents estimated that their SIS® success rate was negatively impacted by at least 10%. Materials supply represents a core area where agile can help improve practices with high cost, time, and effort required.

#### AGILE STATS

**60%**  
of contractors estimate  
an hour per PO to  
correct material issues



For contractors facing communications issues, moving to an agile model under which data is exchanged more quickly may be valuable. The majority of contractors across all revenue levels communicate with distributors manually (via phone, email, or fax). Benefits may be seen by shifting to new web-based collaboration platforms that allow real-time communication. These measures would lead to increased order accuracy and would reduce delays.

## AGILE AND SUPPLIER VALUE ADDED SERVICES

➤ Many distributors commonly offer value added services that may decrease time spent on materials handling and management. Most commonly, these include staging of materials at the distributor and/or job sites, bagging and tagging of products by area, and job boxes for specific uses.

VMI can reduce project support and backroom efforts. “Providing vendors with a bill of materials upfront will help them plan for rough quantities and timing of when materials will be needed, and reduce the likelihood of backorders or other errors” (Daneshgari 2015).

Vendor Managed Consignment Inventory (VMCI) should be investigated to incentivize distributors at the end of a project by sharing a percentage of the material savings realized by utilizing their exper-

tise in helping select the correct products, managing inventory, and leveraging their buying power with the various manufacturers they represent. The distributor could work in a cost-plus fee model, whereby at the end of the project (after meeting the project-established key performance metrics), an additional percentage on material sales could be shared with the distributor. This results in a shared savings at the end of the job for the distributor’s effort in making the project successful. This approach should be taken in an open-book, transparent process where the distributor knows the electrical contractor’s costs for all materials and works diligently to lower the contractor’s overall costs. In addition, the distributor should have an inside purchasing agent working on the project, functioning as a virtual purchasing agent by managing all the inventory and purchasing at no additional cost other

than the markup received from the sale revenue earned during the project.

Another highly ranked headache from the survey was the presence of appropriate storage space for materials on the jobsite. Distributors commonly offer services ranging from wire paralleling to lighting layout and design. Kitting and assembly services or customized pallet configurations can make it easier for contractors to get right to work. The most commonly offered preinstallation services include: wire paralleling, wire and cable cutting/stripping, customized packing/pallet configurations, and lighting. When partnering with a distributor, the contractor can find out about the entire range of services available instead of chasing down meager savings or wasting precious time, money and space on these particular projects.

## CONTRACTOR ROADMAP

### DETERMINE YOUR NEEDS

➤ Contractors often face a variety of project challenges, and while there are some commonalities (lack of jobsite storage and forecasting) issues are often dependent on your specific firm. Work introspectively with employees to determine what your largest supply chain issues are.

### WORK WITH YOUR DISTRIBUTOR

➤ Assuming you’re utilizing an agile model, you have a single trusted distributor that is receptive to your needs. Meet to determine what services they can offer to alleviate your largest supply chain issues. With many distributors offering a wide range of services; you may be surprised by the number of possible solutions.

### CONTINUE TO ANALYZE AND COMMUNICATE PROJECT CHALLENGES

➤ Agile’s strongest benefits come from an ability to quickly recognize, communicate, and solve problems up the supply chain. As you add new services, be mindful of additional problems that your distributor may be able to help you solve.



## SUPPLY CHAIN AND MATERIALS MANAGEMENT ISSUES TEND TO VARY ACROSS BUSINESS SIZES.

For small contractors (<\$10M), the most prevalent issues are product availability and time spent placing and receiving orders. Small contractors do not have the supplier base that large ones do, and most spend more time tracking down the same materials that a large contractor can get from one of their many suppliers in far less time.

Companies with annual revenue between \$50 and \$200 million yearly overwhelmingly selected forecasting and communication as their biggest headache. This preference is significant, chosen almost 2-to-1 over other supply chain issues (Figure 8).

Large contractors (>\$800M) report most issues resulting from forecasting and product availability. Order placement time is not a major issue, pointing to a correlation between contractor size and ability to procure.

## RECOMMENDATIONS BY REGION AND FIRM SIZE

### CONTRACTORS

#### Western Region

##### SMALL

Consider working directly with suppliers to implement a system that reduces your time spent placing and receiving orders. Work with your suppliers to determine possible services they may be able to provide that can ease this burden.

##### MEDIUM

For medium customers in the West, the most common problems are site storage space and forecasting. Contact your supplier and work on developing a relationship that may allow them to assist you with any storage and supply issues as well as forecasting coordination.

##### LARGE

The biggest challenges reported are forecasting and communications issues. Look for new methods to communicate with your supply chain partners that may involve agile processes—larger firms can especially benefit from these.

#### South Central Region

##### SMALL

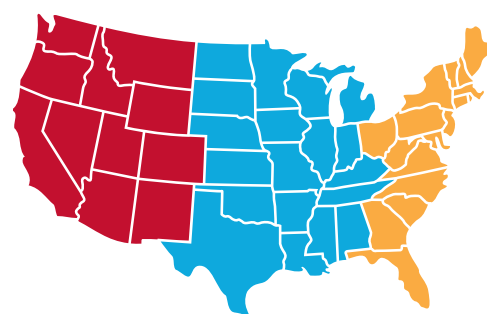
Our results indicate that critical product availability is the most pressing issue for small business in the South Central region. Product availability challenges can be mitigated by working with suppliers on project needs. By establishing a supply chain that involves distributors and manufacturers, smaller contractors can more effectively communicate their needs to their channel partners. Practice a four-week look-ahead style SIS® and mitigate supply issues as early as possible.

##### MEDIUM

Medium contractors in the South Central region point to communication and product availability as the greatest issues. Recommendations remain much the same as those for smaller contractors in this region. The company's larger size may make it easier to partner with distributors and communicate needs effectively.

##### LARGE

None of the responding firms meet these criteria.



➤ WESTERN REGION

➤ SOUTH CENTRAL REGION

➤ EASTERN REGION

#### Eastern Region

##### SMALL

Product availability is the largest issue category for this region. Recommendations remain the same as those for the South Central region.

##### MEDIUM

Forecasting and communication was again the largest issue in this category. See South Central region recommendations.

##### LARGE

Jobsite storage was the largest issue for firms in the Eastern region. Work with supply chain partners to see if options are available for secure jobsite storage or product holding at distributor locations.



# METHODOLOGY & SURVEY

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## ELECTRICAL DISTRIBUTION AND CONSTRUCTION *Developing an Agile Supply Chain Partnership*



## METHODOLOGY

> This research provides the framework for electrical distributors and contractors to establish an Agile Procurement™ process, including:

- > ***Compilation of a database of electrical contractors who use Agile Procurement™ practices; establishing a similar database for electrical contractors using conventional procurement.***
- > ***Survey of NECA members and conduct an outreach program at several NECA regional offices.***
- > ***Compilation of survey questions to include a wide range of database parameters, refer to Appendices A and B for questions asked of Contractors and Manufacturers/Distributors, respectively.***
- > ***Review of existing procurement business practices for both distributors and contractors.***
- > ***Correlation of survey results (Appendix C) and an analysis of the case reviews with the use of Agile Procurement™ to determine areas of strength and opportunities for enhancement.***
- > ***Determination of the best management practices to reduce job site material handling and waste using Agile Procurement™.***
- > ***Outlines of an Agile Procurement™ process with improved efficiency, reduced waste, and a corresponding reduction in costs.***

## SURVEY

> A survey was created and partitioned for both ELECTRI members ([Appendix A](#)) and NAED members ([Appendix B](#)). A total of 249 members, collectively, responded to the survey. Not all questions were answered by every participant. The respondents self-identified as:

**Distributors (135 total)**  
**Contractors (80 total)**  
**Manufacturers (28 total)**

## MANUFACTURER/DISTRIBUTOR/CONTRACTOR QUESTIONS

1. Is your company primarily a Manufacturer, Distributor, or Contractor?
2. What is your company's annual revenue?
3. Where is your company's headquarters?
4. Please rank your market sector revenue:
5. What is your typical cost to generate/process a purchase order (PO)?
6. How many POs do you typically process for a project?
7. Do labor agreements allow the following?
8. What are your biggest headaches in terms of materials management?
9. What steps do you take to improve collaboration with suppliers?
10. Are you a member of NAED and/or NECA?

## MANUFACTURER AND DISTRIBUTOR QUESTIONS

1. Do your terms and conditions use a procurement partnership statement of work with your customer (includes manufacturer-to-distributor or distributor-to-contractor)?
2. What method(s) do you use for communicating with channel partners?
3. Generally speaking, describe your relationship with electrical contractors?
4. What is the frequency with which data is exchanged between you and your channel partners?
5. For which processes does your company rely on supply partners for information/data?

## CONTRACTOR QUESTIONS

1. What is your typical success rate for short-interval (three-week look-ahead) scheduling (SIS)<sup>®</sup> in planned versus actual, as a percent?
2. Assuming that your planned versus actual SIS<sup>®</sup> success rate is negatively impacted, what percentage of this decreased SIS<sup>®</sup> success rate was due to material ordering/ receipt/handling issues?
3. What is your best estimate as to the amount of time that is typically lost due to material ordering/receipt/handling issues?
4. What is your average percentage of waste and theft for miscellaneous material?
5. What Ordering services does your primary supplier typically provide and how is your company charged for these services?
6. What Office and Accounting services does your primary supplier typically provide and how is your company charged for these services?
7. What Shipping and Receiving services does your primary supplier typically provide and how is your company charged for these services?
8. What Warehousing services does your primary supplier typically provide and how is your company charged for these services?
9. What Pre-installation services does your primary supplier typically provide and how is your company charged for these services?
10. What Job Site Management services does your primary supplier typically provide and how is your company charged for these services?
11. Describe your relationship with suppliers and manufacturers.
12. How well do you collaborate and address issues with suppliers and manufacturers?

## RESEARCH MILESTONES

- Establish NAED and NECA task forces and meet with NECA and NAED members to promote the research.
- Develop survey and gather data on current NAED and NECA member procurement processes Solicit case study data from NECA and NAED members.
- Compare data from projects using a conventional procurement approach to those with an agile model basis.
- Document case study data, prepare a roadmap using Agile Procurement™.
- Develop a whitepaper of the research findings.
- Create online articles based upon the whitepaper.
- Present the research findings at NAED regional meetings and EI/NECA meetings Leverage the meeting presentations and develop a webinar.

## RESEARCH QUESTIONS

**Some of the questions that this research intends to address include:**

- How do productivity variations lead to waste, and how can distributor and manufacturer value added services reduce variability and waste?
- How can process mapping and material flow diagrams demonstrate current performance and validate the potential for improved performance?
- How do Building Information Modeling (BIM) and prefabrication affect the distributor/contractor relationship?
- How can distributors develop a better-defined way to go to market and be involved in the earliest stages of a project?
- How can electrical contractors improve communication and planning with their distributors, allowing distributors more flexibility to manage their own inventory/processes and be responsive, instead of reactive, to project needs?
- How can all partners in a supply chain make the transfer of goods easier and faster?
- What value added services can manufacturers and distributors perform to reduce contractor labor time and how can they convince contractors of the need to pay for these services?
- How can the cost of logistics – which is often hidden (lumped with material) and complex – be calculated?
- Given the different business models of manufacturers, suppliers, distributors, and contractors, how can these costs be established?
- What are the opportunities for pre-installation work?
- Can co-location of distributors at contractor shops, or contractor personnel at distributor offices, improve performance?
- How do jurisdictional restrictions affect the ability to deliver value added services?

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# APPENDICES

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## ELECTRICAL DISTRIBUTION AND CONSTRUCTION

*Developing an Agile Supply Chain Partnership*



## APPENDIX A: CONTRACTOR SURVEY QUESTIONS

### 1. Is your company primarily a:

- a. Manufacturer
- b. Distributor
- c. Contractor
- d. Don't know

### 2. What is your company's annual revenue?

- a. Less than \$10M
- b. \$10M–\$25M
- c. \$25M–\$50M
- d. \$50M–\$100M,
- e. \$100M–\$200M,
- f. \$200M–\$400M
- g. \$400M–\$800M
- h. Greater than \$800M

### 3. Where is your company's headquarters?

- a. West of the Rockies
- b. South Central-Midwest
- c. Eastern Seaboard, from Maine to Florida and including Ohio, Pennsylvania, and New York
- d. Don't know

### 4. Rank your market sector revenue from those shown below, with 1 being the highest:

- a. Residential \_\_\_\_\_
- b. Commercial \_\_\_\_\_
- c. Industrial (and Process) \_\_\_\_\_
- d. Institutional (including Schools and Hospitals) \_\_\_\_\_
- e. Governmental \_\_\_\_\_
- f. Utility (incl. Transportation and Renewable Power) \_\_\_\_\_
- g. Maintenance and Operations \_\_\_\_\_
- h. Other (please list) \_\_\_\_\_

### 5. What is your typical cost to generate/process a purchase requisition/purchase order (PO)?

- a. Less than \$25
- b. \$25–\$50
- c. \$50–\$100
- d. \$100–\$200
- e. Greater than \$200

### 6. How many POs do you typically process for a project?

- a. Less than 25
- b. 25–50
- c. 50–100
- d. 100–250
- e. 250–500
- f. Greater than 500

### 7. What is your typical success rate for short-interval (three-week look-ahead) scheduling® (SIS®) in planned versus actual, as a percent?

- a. Less than 50%
- b. 50%–70%
- c. 70%–80%
- d. 80%–85%
- e. Greater than 85%

### 8. Assuming that your planned versus actual SIS® success rate is negatively impacted, what percentage of this decreased SIS® success rate was due to material ordering/receipt/handling issues?

- a. Less than 2%
- b. 2%–5%
- c. 5%–10%
- d. 10%–20%
- e. Greater than 20%

### 9. What is your best estimate as to the amount of time that is typically lost due to material ordering/receipt/handling issues?

- a. Less than 1 hr./PO
- b. 1 hr./PO–5 hrs./PO
- c. 5 hrs./PO–10 hrs./PO
- d. Greater than 10 hrs./PO

### 10. What is your average percentage of waste and theft for miscellaneous material on a project?

#### Waste

- a. Less than 1%
- b. 1–4%
- c. 4–7%
- d. 7–10%
- e. Greater than 10%

#### Theft

- a. Less than 1%
- b. 1–4%
- c. 4–7%
- d. 7–10%
- e. Greater than 10%

**11. What Ordering services does your primary supplier typically provide and how is your company charged for these services?**

	Provided at no cost	Bundled with other services	Different for each customer	Specific fee	Promotion
Product training/education					
Technical assistance					
Design alternatives					
Repair/return support					
Processing rebates or incentives					
Warranty					
Collection & credit					
Financing					
Co-location of personnel					

**12. What Office and Accounting services does your primary supplier typically provide and how is your company charged for these services?**

	Provided at no cost	Bundled with other services	Different for each customer	Specific fee	Promotion
Price books compatible with estimation software					
Weekly material summaries					
EDI invoicing					
Once per month invoicing					
Summary billing					

**13. What Shipping and Receiving services does your primary supplier typically provide and how is your company charged for these services?**

	Provided at no cost	Bundled with other services	Different for each customer	Specific fee	Promotion
Emergency deliveries					
Job site delivery					
Multiple delivery locations at site					
Coordination of special delivery					
Staging orders					
Early AM delivery					
Night delivery to a secured container					
Vendor managed inventory					
On-site containers inventory					
Project logistics management					
Material scheduling					
Material tracking					
Bar coding					

**14. What Warehousing services does your primary supplier typically provide and how is your company charged for these services?**

	Provided at no cost	Bundled with other services	Different for each customer	Specific fee	Promotion
Radio-frequency identification (RFID) labeling					
Bin restocking for service trucks					
Bin restocking for prefabrication					
Inventory reduction					
Storeroom management					

**15. What Pre-installation services does your primary supplier typically provide and how is your company charged for these services?**

	Provided at no cost	Bundled with other services	Different for each customer	Specific fee	Promotion
Lighting layout and design					
Lighting fixture packaging removal and palletization					
Wire paralleling					
Wire & cable cutting & stripping					
Minor preassembly					
Job cages for fixture packages					
Sequencing of orders to customer's schedule					
Conduct energy audits					
Energy efficiency design alternatives					
Kitting or assembly services					
Customized packing or pallet configurations					
Layout and design work					
Customized labels & markings					
Pulling heads					
Powercord modification & termination					
DIN rail assembly, including cutting and punching					
Building Information Modeling					

**16. What Job Site Management services does your primary supplier typically provide and how is your company charged for these services?**

	Provided at no cost	Bundled with other services	Different for each customer	Specific fee	Promotion
Bagged/tagged by area					
Staging at distributor site					
Staging at job site					
Onsite storage					
Job boxes					
Programming					
Commissioning					

**17. Do labor agreements allow the following?**

	Yes	No	Restricted to call/schedule	Contractor may specify	Jurisdiction determines
Unrestricted material delivered to dock/jobsite					
Material to be delivered to the point of installation, such as a specific floor/area					
Contractor prefabrication					
Supplier/distributor prefabrication					
Prefabrication if the assembly has a designated part number and is included in a catalog					

**18. What are your biggest headaches in terms of materials management? (Rank from 1-5)**

- Availability of storage space at jobsite\_\_\_\_\_
- Forecasting and communication\_\_\_\_\_
- Critical product availability\_\_\_\_\_
- Jobsite security\_\_\_\_\_
- Time spent placing and receiving orders\_\_\_\_\_



## 19. Describe your relationship with suppliers and manufacturers.

	Excellent	Very Good	Good	Fair	Poor	Varies
Suppliers						
Manufacturers						

*Excellent – we are always in total alignment*

*Very good – we communicate frequently and effectively solve problems*

*Good – they respond to requests but are not interactive or proactive*

*Fair – responsiveness is slow and often incomplete*

*Poor – we are actively looking to align with others*

*Varies – depends upon size and/or local rep*

## 20. How well do you collaborate and address issues with suppliers and manufacturers?

		Excellent	Very Good	Good	Fair	Poor	Varies
Suppliers	Parts shortages / capacity issues						
	Event management						
	Risk management						
	Sales & Ops Planning						
	Forecasting						
Manufacturers	Parts shortages / capacity issues						
	Event management						
	Risk management						
	Sales & Ops Planning						
	Forecasting						

## 21. What steps do you take to improve collaboration with suppliers?

	Have taken	Plan to take	Do not plan to take
Better management of logistics			
Improve planning of customer fulfillment			
Optimize sourcing and distribution decisions (network design)			
Implementation of supply chain software/IT solutions			
Gain greater visibility into in-transit shipments			
Better management of global suppliers			
Adopt collaborative inventory planning strategy (e.g., Vendor Management Inventory (VMI))			
Implementation of social network technologies (e.g., Chatter, Yammer, etc.)			

## 22. Are you a member of (please check all that apply):

- a. NAED (National Association of Electrical Distributors)
- b. ELECTRI International – The Foundation for Electrical Contractors
- c. NECA (National Electrical Contractors Association)
- d. None of the above

## 23. Thank you for your participation and assistance on this research project. If you will allow us to contact you for clarification or additional information concerning your responses, please provide the following contact details:

- a. Name
- b. Company
- c. Address 1
- d. Address 2
- e. City/Town
- f. State/Province
- g. ZIP/Postal Code
- h. Country
- i. Email Address
- j. Phone Number
- k. No thank you. I do not wish to be contacted.

## APPENDIX B: MANUFACTURER AND DISTRIBUTOR SURVEY QUESTIONS

### 1. Is your company primarily a:

- a. Manufacturer
- b. Distributor
- c. Contractor
- d. Don't know

### 2. What is your company's annual revenue?

- a. Less than \$10M
- b. \$10M–\$25M
- c. \$25M–\$50M
- d. \$50M–\$100M,
- e. \$100M–\$200M,
- f. \$200M–\$400M
- g. \$400M–\$800M
- h. Greater than \$800M

### 3. Where is your company's headquarters?

- a. Eastern Region
- b. Western Region
- c. South Central Region
- d. Outside of U.S.
- e. Don't know

### 4. Rank your market sector revenue from those shown below, with 1 being the highest:

- a. Residential\_\_\_\_\_
- b. Commercial\_\_\_\_\_
- c. Industrial (and Process)\_\_\_\_\_
- d. Institutional (including Schools and Hospitals)\_\_\_\_\_
- e. Governmental\_\_\_\_\_
- f. Utility (incl. Transportation and Renewable Power)\_\_\_\_\_
- g. Maintenance and Operations\_\_\_\_\_
- h. Other (please list) \_\_\_\_\_

### 5. What is your typical cost to generate/process a purchase requisition/purchase order (PO)?

- a. Less than \$25
- b. \$25–\$50
- c. \$50–\$100
- d. \$100–\$200
- e. Greater than \$200

### 6. How many POs do you typically process for a project?

- a. Less than 25
- b. 25–50
- c. 50–100
- d. 100–250
- e. 250–500
- f. Greater than 500

### 7. Does your company participate in Special Pricing Agreements (SPAs)?

- a. Yes
- b. No
- c. Don't know

### 8. Do your terms and conditions use a procurement partnership statement of work with your customer (includes manufacturer to distributor or distributor to electrical contractor, but not manufacturer to electrical contractor)?

- a. Yes
- b. No
- c. Don't know

### 9. Do labor agreements allow the following?

	Yes	No	Restricted to call/schedule	Contractor may specify	Jurisdiction determines
Unrestricted material delivered to dock/jobsite					
Material to be delivered to the point of installation, such as a specific floor/area					
Contractor prefabrication					
Supplier/distributor prefabrication					
Prefabrication if the assembly has a designated part number and is included in a catalog					

### 10. What are your biggest headaches in terms of materials management? (Rank from 1-5)

- a. Availability of storage space at jobsite\_\_\_\_\_
- b. Forecasting and communication\_\_\_\_\_
- c. Critical product availability\_\_\_\_\_
- d. Jobsite security\_\_\_\_\_
- e. Time spent placing and receiving orders\_\_\_\_\_

**11. What method(s) do you use for communicating with trading partners? (Select all that apply)**

	Manual (text, email, phone, fax, web conferencing)	Enterprise Resource Planning (ERP)	3rd Party Web Portal	Electronic Data Interchange (EDI)	Cloud-Based Collaboration Platform	Other	None of these
Electrical Contractors (Tier 1)							
Suppliers to Electrical Contractors (Tier 2)							
Suppliers to Tier-2 Suppliers (Tier 3)							

**12. Generally speaking, describe your relationship with electrical contractors?**

- a. Excellent, we are always in total alignment
- b. Very good, we communicate frequently and effectively solve problems
- c. Good, they respond to requests but are not interactive or proactive
- d. Fair, responsiveness is slow and often incomplete
- e. Poor, we are actively looking to align with other customers
- f. Varies, depends upon size of contractor and/or local rep.

**13. How well do you collaborate and address issues with electrical contractors?**

	Excellent	Very Good	Good	Fair	Poor
Parts shortages / capacity issues					
Event management					
Risk management					
Sales & Ops Planning					
Forecasting					

**14. What is the frequency with which data is exchanged between you and your channel partners?**

	Batch weekly or less often	Batch, daily	Batch, hourly	Near Real-time	Real-time	Never
Demand						
Inventory levels – finished goods						
Inventory levels – components or materials						
Shipment information						

**15. For which processes does your company rely on supply partners for information or data? (Check all that apply)**

- a. Transportation/Logistics\_\_\_\_\_
- b. Inventory management\_\_\_\_\_
- c. Manufacturing\_\_\_\_\_
- d. Order management\_\_\_\_\_
- e. Repairs and returns\_\_\_\_\_
- f. Supply planning and management\_\_\_\_\_
- g. Sourcing, procurement, and contracts management\_\_\_\_\_
- h. Overall supply chain operations\_\_\_\_\_
- i. Demand management\_\_\_\_\_
- j. Risk monitoring and response\_\_\_\_\_
- k. Product lifecycle management\_\_\_\_\_
- l. None – Do not outsource any supply chain tasks\_\_\_\_\_
- m. Don't know\_\_\_\_\_

**16. What steps do you take to improve collaboration with suppliers?**

	Have taken	Plan to take	Do not plan to take
Better management of logistics			
Improve planning of customer fulfillment			
Optimize sourcing and distribution decisions (network design)			
Implementation of supply chain software/IT solutions			
Gain greater visibility into in-transit shipments			
Better management of global suppliers			
Adopt collaborative inventory planning strategy (e.g., Vendor Management Inventory (VMI))			
Implementation of social network technologies (e.g., Chatter, Yammer, etc.)			

**17. Are you a member of (please check all that apply):**

- a. NAED (National Association of Electrical Distributors)
- b. ELECTRI International – The Foundation for Electrical Contractors
- c. NECA (National Electrical Contractors Association)
- d. None of the above

**18. Thank you for your participation and assistance on this research project. If you will allow us to contact you for clarification or additional information concerning your responses, please provide the following contact details:**

- a. Name
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- c. Address 1
- d. Address 2
- e. City/Town
- f. State/Province
- g. ZIP/Postal Code
- h. Country
- i. Email Address
- j. Phone Number
- k. No thank you. I do not wish to be contacted.



## APPENDIX C: SURVEY RESULTS

### MANUFACTURER/DISTRIBUTOR/CONTRACTOR QUESTIONS

1. Is your company primarily a Manufacturer, Distributor, or Contractor?
2. What is your company's annual revenue?
3. Where is your company's headquarters?
4. Please rank your market sector revenue.
5. What is your typical cost to generate/process a purchase requisition/purchase order (PO)?
6. How many POs do you typically process for a project?
7. Do labor agreements allow the following?
8. What are your biggest headaches in terms of material management?
9. What steps do you take to improve collaboration with suppliers?
10. Are you a member of NAED, ELECTRI, and/or NECA?

#### 1. Is your company primarily a:

	Response	Percent
Distributor	135	55%
Contractor	80	33%
Don't know	1	0%
Manufacturer	28	11%
Total	244	100%

#### 2. Where is your company's headquarters?

	Response	Percent
Western region	60	33%
South Central region	71	39%
Eastern region	44	24%
Outside the U.S.	8	4%
I don't know	0	0%
Total	183	100%

#### 3. What is your company's annual revenue?

	Response	Percent
Less than \$10 million	31	13%
\$10-\$25 million	26	11%
\$25-\$50 million	37	16%
\$50-\$100 million	33	14%
\$100-\$200 million	34	15%
\$200-\$400 million	26	11%
\$400-\$800 million	13	6%
Greater than \$800 million	32	14%
Total	232	100%

#### 4. Rank your market sector revenue, with 1 being the highest.

	1	2	3	4	5	6	7	8	Total
Residential	11	30	32	21	27	24	61	13	219
Commercial	135	37	19	13	9	4	2	0	219
Industrial (and Process)	37	47	39	30	32	20	13	1	219
Institutional (including schools & hospitals)	13	40	40	58	35	22	11	0	219
Governmental	5	14	17	32	48	60	41	2	219
Utility (incl. Renewable Power & Transportation)	7	15	20	17	30	50	70	10	219
Maintenance & Operations	6	32	48	45	35	36	17	0	219
Other (please list)	5	4	4	3	3	3	4	193	219
Total	219	219	219	219	219	219	219	219	219

#### 5. What is your typical cost to generate/process a purchase requisition/purchase order (PO)?

	Response	Percent
Less than \$25	54	27%
\$25-\$50	72	36%
\$50-\$100	56	28%
\$100-\$200	7	4%
Greater than \$200	9	5%
Total	198	100%

#### 6. How many POs do you typically process for a project?

	Response	Percent
Less than \$25	108	56%
25-50	37	19%
50-100	27	14%
100-250	15	8%
250-500	5	3%
Greater than 500	1	2%
Total	193	100%

## 7. Do labor agreements allow the following?

	Yes	No	Restricted to call/schedule	Contractor may specify	Jurisdiction determines	Total
Unrestricted material delivered to dock/jobsite	89	14	9	44	10	166
Material to be delivered to the point of installation, such as a specific floor/area	60	37	8	54	7	166
Contractor prefabrication	90	22	1	41	11	165
Supplier/distributor prefabrication	67	46	2	37	14	166
Prefabrication if the assembly has a designated part number and is included in a catalog	88	30	0	31	13	162

## 8. What are your biggest headaches in terms of materials management?

	1	2	3	4	5	Total
Availability of storage space at jobsite	24	30	32	55	19	160
Forecasting & communication	69	34	31	16	10	160
Critical product availability	43	40	34	23	20	160
Jobsite security	4	14	28	30	84	160
Time spent placing and receiving orders	20	42	35	36	27	160
Total	160	160	160	160	160	-

## 9. What steps do you take to improve collaboration with your primary supply partners?

	Have taken	Plan to take	Don't plan to take	Total
Better management of logistics	41	27	12	80
Improve planning of customer fulfillment	40	30	8	78
Optimize sourcing & distribution decisions (network design)	25	24	28	77
Implementation of supply chain software/IT solutions	39	22	18	79
Gain greater visibility into in-transit shipments	37	24	19	80
Better management of global suppliers	22	19	38	79
Adopt collaborative inventory planning strategy (e.g. Vendor Management Inventory (VMI))	46	10	24	80
Implementation of social network technologies (e.g. Chatter, Yammer, etc.)	17	17	45	79

## 10. Are you a member of:

	Response	Percent
NAED (National Association of Electrical Distributors)	87	61%
ELECTRI International - The Foundation for Electrical Contractors	43	30%
NECA (National Electrical Contractors Association)	62	46%
None of these	3	2%

## MANUFACTURER OR DISTRIBUTOR QUESTIONS

1. Do your terms and conditions use a procurement partnership statement of work with your customer (include manufacturer to distributor or distributor to electrical contractor, but not manufacturer to electrical contractor)?
2. What method(s) do you use for communicating with channel partners?
3. Generally speaking, describe your relationship with electrical contractors?
4. What is the frequency with which data is exchanged between you and your channel partners?
5. For which process does your company rely on supply partners for information or data?

### 1. Do your terms and conditions use a procurement partnership statement of work with your customer?

	Response	Percent
Yes	50	57%
No	37	43%
Total	87	100%

### 2. What method(s) do you use for communicating with channel partners?

	Manual (text, email, phone, fax, web conferencing)	Enterprise Resource Planning (ERP)	3rd party Web Portal	Electronic Data Interchange (EDI)	Cloud-Based Collaboration Platform	Other	None of these	Total
Electrical Contractors (Tier1)	82	9	15	18	10	7	3	144
Suppliers to Electrical Contractors (Tier 2)	80	19	21	32	15	7	2	176
Suppliers to Tier-2 Suppliers (Tier 3)	56	19	24	40	11	4	2	156

### 3. Generally speaking, describe your relationship with electrical contractors?

	Excellent	Very Good	Good	Fair	Poor	Varies	Total
Parts shortages / capacity issues	8	34	33	14	7	1	97
Event management	10	41	27	12	4	1	95
Risk management	4	35	31	19	2	5	96
Sales & Ops Planning	7	47	27	12	3	1	97
Forecasting	5	21	37	21	12	1	97

### 4. What is the frequency with which data is exchanged between you and your channel partners?

	Batch weekly or less often	Batch, daily	Batch, hourly	Near Real-time	Real-time	Never	Total
Demand	33	24	1	4	20	13	95
Inventory levels – finished goods	29	22	4	4	26	10	95
Inventory levels – components or materials	27	25	1	2	25	16	96
Shipment information	27	28	4	4	28	5	96

### 5. For which processes does your company rely on supply partners for information or data?

	Response	Percent
Transportation/Logistics	47	52%
Inventory management	38	42%
Manufacturing	39	43%
Order management	38	42%
Repairs and returns	56	62%
Supply planning and management	20	22%
Sourcing, procurement, and contracts management	24	26%
Overall supply chain operations	17	19%
Demand management	17	19%
Risk monitoring and response	9	10%
Product lifecycle management	13	14%
None - Do not outsource any supply chain tasks	16	18%
Don't know	12	13%

## CONTRACTOR QUESTIONS

1. What is your typical success rate for Short Interval Scheduling® (three-week look-ahead) (SIS)® in planned versus actual, as a percent?
2. Assuming that your planned versus actual SIS® success rate is negatively impacted, what percentage of this decreased SIS® success rate was due to material ordering/receipt/handling issues?
3. What is your best estimate as to the amount of time that is typically lost due to material ordering/receipt/handling issues?
4. What is your average percentage of waste and theft for miscellaneous material on a project?
5. What Ordering services does your primary supplier typically provide and how is your company charged for these services?
6. What Office and Accounting services does your primary supplier typically provide and how is your company charged for these services?
7. What Shipping and Receiving services does your primary supplier typically provide and how is your company charged for these services?
8. What Warehousing services does your primary supplier typically provide and how is your company charged for these services?
9. What Pre-installation services does your primary supplier typically provide and how is your company charged for these services?
10. What Job Site Management services does your primary supplier typically provide and how is your company charged for these services?
11. Describe your relationship with suppliers and manufacturers?
12. How well do you collaborate and address issues with suppliers and manufacturers?

### 1. What is your typical success rate for Short-Interval Scheduling)® (three-week look-ahead) (SIS®)?

	Response	Percent
Less than 50%	16	25%
50%-70%	21	33%
70%-80%	11	17%
80%-85%	9	14%
Greater than 85%	7	11%
Total	64	100%

### 2. Assuming that your planned versus actual SIS® success rate is negatively impacted, what percentage of this decreased SIS® success rate was due to material ordering/receipt/handling issues?

	Response	Percent
Less than 2%	11	18%
2%-5%	14	23%
5%-10%	21	34%
10%-20%	8	13%
Greater than 20%	7	11%
Total	61	100%

### 3. What is the amount of time that is typically lost due to material ordering/receipt/handling issues?

	Response	Percent
Less than 1 hr./PO	26	41%
1 hr./PO - 5 hrs./PO	33	52%
5 hrs./PO - 10 hrs./PO	4	6%
Grather than 10 hrs./PO	1	2%
Total	64	100%

### 4. What is your average percentage of waste for miscellaneous material on a project?

	Response	Percent
Less than 1%	10	16%
1%-4%	29	48%
4%-7%	14	23%
7%-10%	7	11%
Greater than 10%	1	2%
Total	61	100%

### 5a. What Ordering Services does your primary supplier typically provide?

	Response	Percent
Product training/education	38	67%
Technical assistance	44	77%
Design alternatives	30	53%
Repair/return support	47	82%
Processing rebates or incentives	31	54%
Warranty	33	58%
Collection & credit	22	39%
Financing	7	12%
Co-location of personnel	12	21%

### 5b. How are you charged for these Ordering Services?

	Provided at no cost	Bundled w/ services	Different per project	Specific fee	Promotion	Total
Product training/education	28	4	5	1	0	38
Technical assistance	32	5	5	2	0	44
Design alternatives	24	4	2	0	0	30
Repair/return support	28	7	8	4	0	47
Processing rebates or incentives	20	6	4	0	0	30
Warranty	24	5	3	1	0	33
Collection & credit	14	2	5	0	0	21
Financing	4	1	2	0	0	7
Co-location of personnel	5	4	3	0	0	12

### 6a. What Office and Accounting services does your supplier provide?

	Response	Percent
Price books compatible with estimation software	20	36%
Weekly material summaries	17	31%
EDI invoicing	30	55%
Once per month invoicing	30	55%
Summary billing	35	64%

### 6b. How are you charged for these Office and Accounting services?

	Provided at no cost	Bundled w/ services	Different per project	Specific fee	Promotion	Total
Price books compatible with estimation software	15	4	0	0	0	19
Weekly material summaries	14	2	0	0	0	16
EDI invoicing	22	7	0	0	0	29
Once per month invoicing	25	3	0	0	0	28
Summary billing	26	7	0	0	0	33

### 7a. What Shipping and Receiving services does your primary supplier typically provide?

	Response	Percent
Emergency deliveries	48	83%
Job site delivery	55	95%
Multiple delivery locations at site	26	45%
Coordination of special delivery	35	60%
Staging orders	37	64%
Early AM delivery	47	81%
Night delivery to a secured container	11	19%
Vendor managed inventory	32	55%
On-site containers inventory	24	41%
Project logistics management	22	38%
Material scheduling	29	50%
Material tracking	36	62%
Bar coding	11	19%

### 7b. How is your company charged for these Shipping and Receiving services?

	Provided at no cost	Bundled w/ services	Different per project	Specific fee	Promotion	Total
Emergency deliveries	30	4	6	8	0	48
Job site delivery	44	10	1	0	0	55
Multiple delivery locations at site	18	7	1	0	0	26
Coordination of special delivery	23	9	3	0	0	35
Staging orders	19	11	6	1	0	37
Early AM delivery	39	6	1	1	0	47
Night delivery to a secured container	8	3	0	0	0	11
Vendor managed inventory	14	6	8	3	0	31
On-site containers inventory	12	4	6	2	0	24
Project logistics management	10	7	5	0	0	22
Material scheduling	23	6	0	0	0	29
Material tracking	27	7	1	0	0	35
Bar coding	6	3	1	1	0	11

### 8a. What Warehousing services does your primary supplier typically provide?

	Response	Percent
Radio-frequency identification (RFID) labeling	4	15%
Bin restocking for service trucks	13	50%
Bin restocking for prefabrication	14	54%
Inventory reduction	14	54%
Storeroom management	11	42%

### 8b. How is your company charged for these Warehousing services?

	Provided at no cost	Bundled w/ services	Different per project	Specific fee	Promotion	Total
Radio-frequency identification (RFID) labeling	3	1	0	0	0	4
Bin restocking for service trucks	9	4	0	0	0	13
Bin restocking for prefabrication	10	4	0	0	0	14
Inventory reduction	11	2	1	0	0	14
Storeroom management	7	2	2	0	0	11



**9a. What Pre-installation services does your primary supplier typically provide?**

	Response	Percent
Lighting layout and design	28	50%
Lighting fixture packaging removal and palletization	26	46%
Wire paralleling	42	75%
Wire & cable cutting & stripping	37	66%
Minor preassembly	9	16%
Job cages for fixture packages	10	18%
Sequencing of orders to customer's schedule	27	48%
Conduct energy audits	10	18%
Energy efficiency design alternatives	14	25%
Kitting or assembly services	21	38%
Customized packing or pallet configurations	31	55%
Layout and design work	11	20%
Customized labels & markings	20	36%
Pulling heads	27	48%
Powercord modification & termination	4	7%
DIN rail assembly, including cutting and punching	3	5%
Building Information Modeling	3	5%

**9b. How is your company charged for these Pre-installation services?**

	Provided at no cost	Bundled w/ services	Different per project	Specific fee	Promotion	Total
Lighting layout and design	21	4	1	1	1	28
Lighting fixture packaging removal and palletization	5	5	8	8	0	26
Wire paralleling	16	7	10	9	0	42
Wire & cable cutting & stripping	15	4	8	10	0	37
Minor preassembly	2	4	2	1	0	9
Job cages for fixture packages	7	1	2	0	0	10
Sequencing of orders to customer's schedule	16	8	2	1	0	27
Conduct energy audits	5	2	1	1	1	10
Energy efficiency design alternatives	12	1	0	1	0	14
Kitting or assembly services	8	4	4	5	0	21
Customized packing or pallet configurations	14	6	6	5	0	31
Layout and design work	7	3	1	0	0	11
Customized labels & markings	8	8	2	1	0	19
Pulling heads	4	3	8	12	0	27
Powercord modification & termination	1	0	1	2	0	4
DIN rail assembly, including cutting and punching	0	1	1	1	0	3
Building Information Modeling	0	2	0	1	0	3

### 10a. What Job Site Management services does your primary supplier typically provide?

	Response	Percent
Bagged/Tagged by area	18	41%
Staging at distributor site	32	73%
Staging at job site	21	48%
Onsite storage	17	39%
Job boxes	16	36%
Programming	5	11%
Commissioning	10	26%

### 10b. How is your company charged for these Job Site Management services?

	Provided at no cost	Bundled w/ services	Different per project	Specific fee	Promotion	Total
Bagged/Tagged by area	8	4	4	2	0	18
Staging at distributor site	16	8	7	1	0	32
Staging at job site	8	7	4	1	1	21
Onsite storage	8	3	5	1	0	17
Job boxes	8	3	4	1	0	16
Programming	1	2	2	0	0	5
Commissioning	1	3	4	2	0	10

### 11. Describe your relationship with suppliers and manufacturers.

	Excellent	Very Good	Good	Fair	Poor	Varies	Total
Suppliers	15	28	11	1	0	0	55
Manufacturers	10	17	22	4	1	1	55

### 12a. How well do you collaborate and address issues with suppliers?

	Excellent	Very Good	Good	Fair	Poor	Varies	Total
Parts shortages / capacity issues	9	27	14	5	0	0	55
Event management	7	24	15	5	2	2	55
Risk management	5	22	17	6	3	2	55
Sales & Ops Planning	9	23	16	5	1	1	55
Forecasting	7	15	23	8	1	1	55

### 12b. How well do you collaborate and address issues with manufacturers?

	Excellent	Very Good	Good	Fair	Poor	Varies	Total
Parts shortages / capacity issues	3	18	20	10	2	2	55
Event management	4	18	18	8	5	2	55
Risk management	2	17	19	10	5	2	55
Sales & Ops Planning	4	17	21	7	4	2	55
Forecasting	5	14	22	8	3	3	55

## APPENDIX D: VALUE ADDED SERVICES MOST COMMONLY REQUESTED

➤ From these tables certain categories of services are offered more often than others. Shipping and Receiving (11), and Preinstallation (9) were the most frequently requested compensable services. **Together, there were 20 services cited where the sum of the “bundled price with other services” was greater than 20%.** Ordering, Office and Accounting, Job Site Management, and Warehousing offer many opportunities collectively, but fewer in total than Shipping and Receiving by itself.

Ordering Services	Bundled price	Charged specific fee	Total responses	(Bundled + Fee) / Total
Co-location of personnel	4	0	12	33%
Repair/return support	7	4	47	23%
Processing rebates or incentives	6	0	30	20%
Warranty	5	1	33	18%

Office and Accounting Services	Bundled price	Charged specific fee	Total responses	(Bundled + Fee) / Total
EDI invoicing	7	0	29	24%
Summary billing	7	0	33	21%
Price books compatible with estimation software	4	0	19	21%
Weekly material summaries	2	0	16	13%

Shipping and Receiving Services	Bundled price	Charged specific fee	Total responses	(Bundled + Fee) / Total
Emergency deliveries	4	8	19	63%
Job site delivery	10	0	16	63%
Material tracking	7	0	16	44%
Early AM delivery	6	1	19	37%
Staging orders	11	1	33	36%
Coordination of special delivery	9	0	28	32%
Material scheduling	6	0	19	32%
Vendor managed inventory	6	3	29	31%
Multiple delivery location at job site	7	0	29	24%
On-site containers inventory	4	2	28	21%
Project logistics management	7	0	33	21%
Night delivery to a secured container	3	0	16	19%

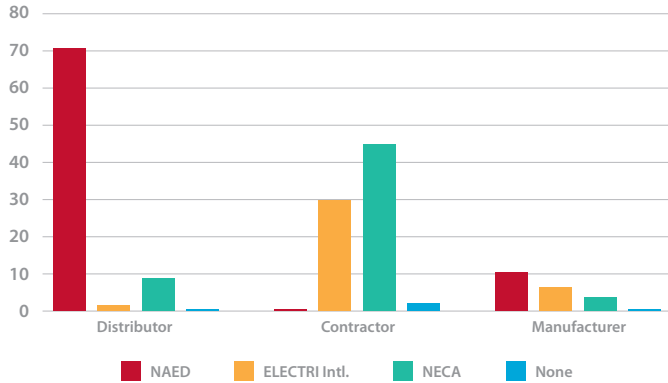
Warehousing Services	Bundled price	Charged specific fee	Total responses	(Bundled + Fee) / Total
Bin restocking for service trucks	4	0	16	25%
Bin restocking for prefabrication	4	0	29	14%

Pre-installation Services	Bundled price	Charged specific fee	Total responses	(Bundled + Fee) / Total
Lighting fixture packaging removal and palletization	5	8	16	81%
Wire paralleling	7	9	29	55%
Pulling heads	3	12	28	54%
Wire & cable cutting & stripping	4	10	28	50%
Customized packing or pallet configurations	6	5	28	39%
Sequencing of orders to customer's schedule	8	1	28	32%
Kitting or assembly services	4	5	28	32%
Customized labels & markings	8	1	28	32%
Lighting layout and design	4	1	19	26%
Minor preassembly	4	1	33	15%

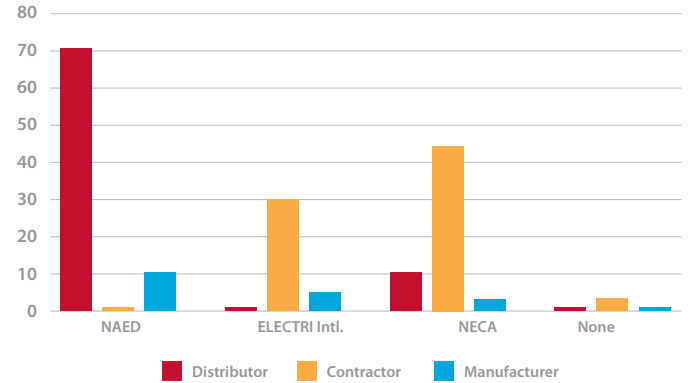
Job Site Management Services	Bundled price	Charged specific fee	Total responses	(Bundled + Fee) / Total
Staging at distributor site	8	1	16	56%
Bagged / Tagged by area	4	2	19	32%
Staging at job site	7	1	29	28%
Commissioning	3	2	38	18%

## APPENDIX E: SELECT SURVEY FILTERS

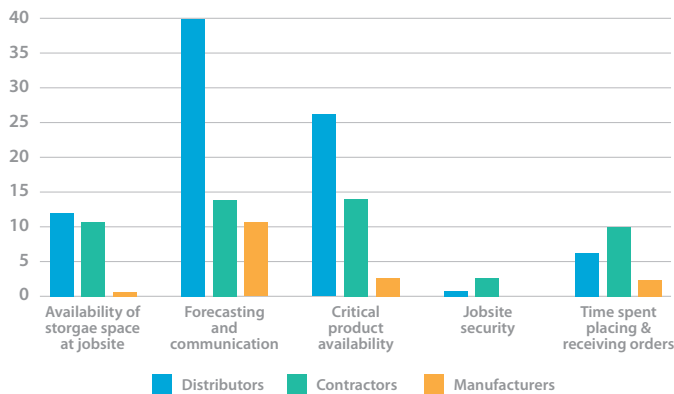
MEMBERSHIP VERSUS SUPPLY CHAIN PARTNER



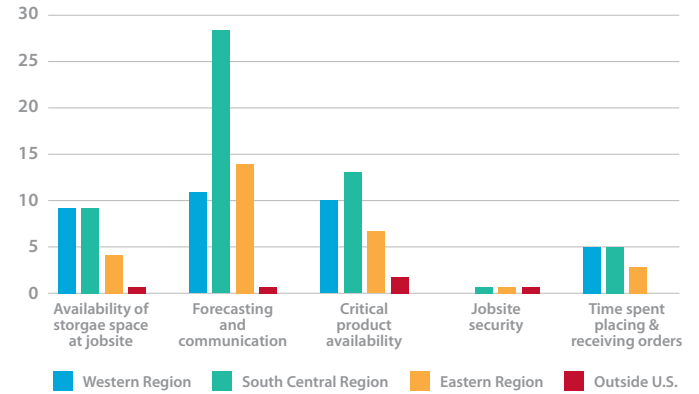
SUPPLY CHAIN PARTNER VERSUS MEMBERSHIP



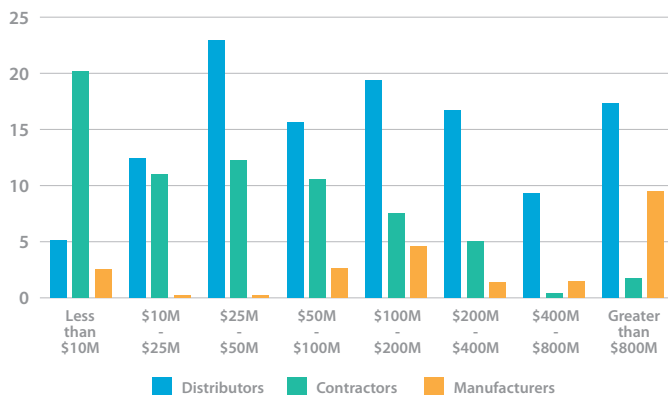
BIGGEST HEADACHES VERSUS SUPPLY CHAIN PARTNER



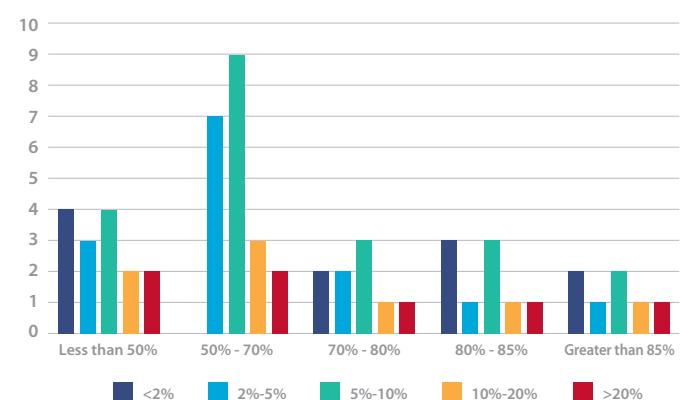
REGION VERSUS BIGGEST HEADACHES



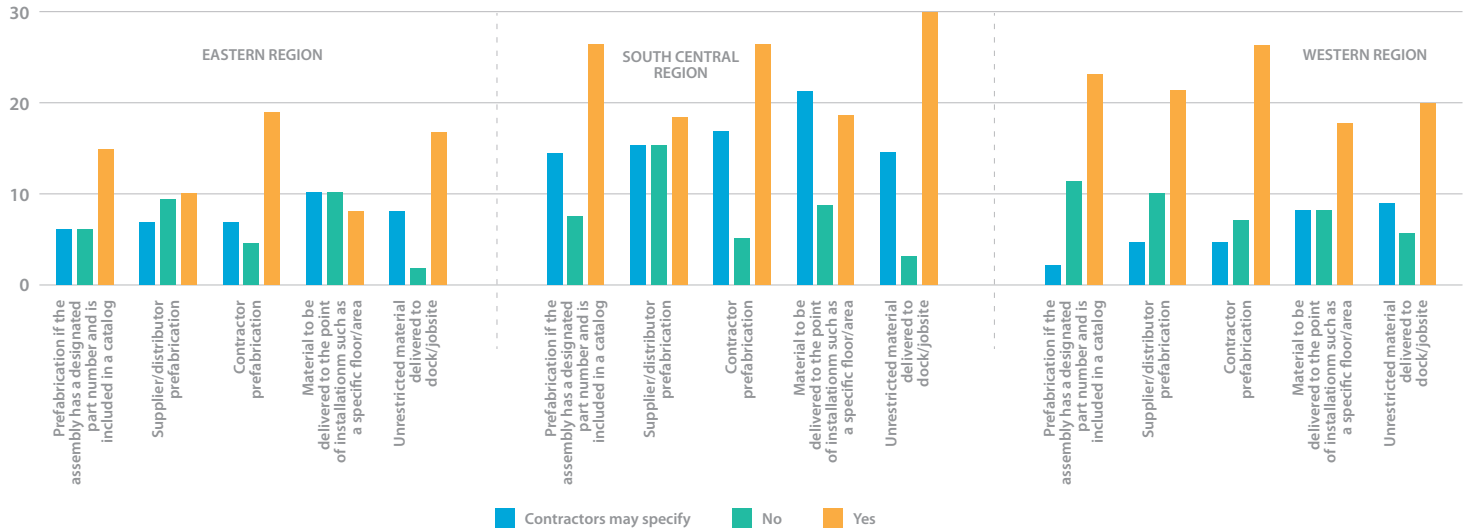
SUPPLY CHAIN PARTNER VERSUS REVENUE



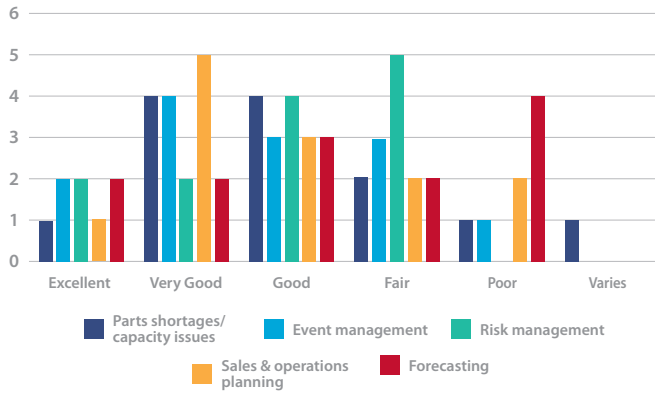
SUCCESS RATE, AMOUNT DECREASED BY MATERIAL ISSUES



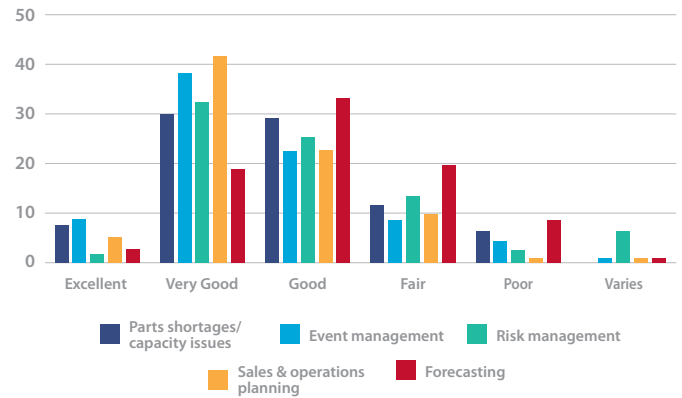
### REGION VERSUS LABOR RESTRICTIONS



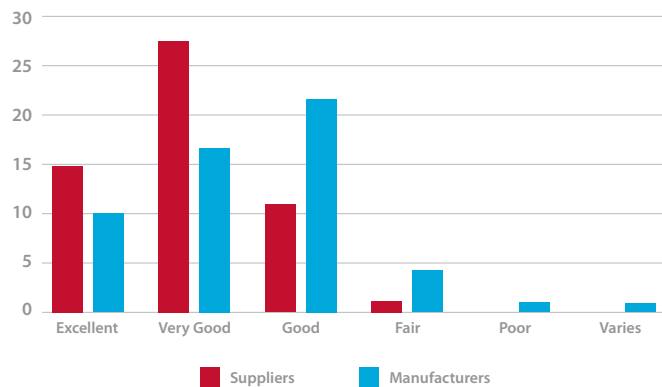
### MANUFACTURER RELATIONSHIPS WITH CONTRACTORS



### DISTRIBUTOR RELATIONSHIPS WITH CONTRACTORS



### CONTRACTOR RELATIONSHIPS WITH MANUFACTURERS/SUPPLIERS







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