

Achieving Material Handling Connectivity



CROWN

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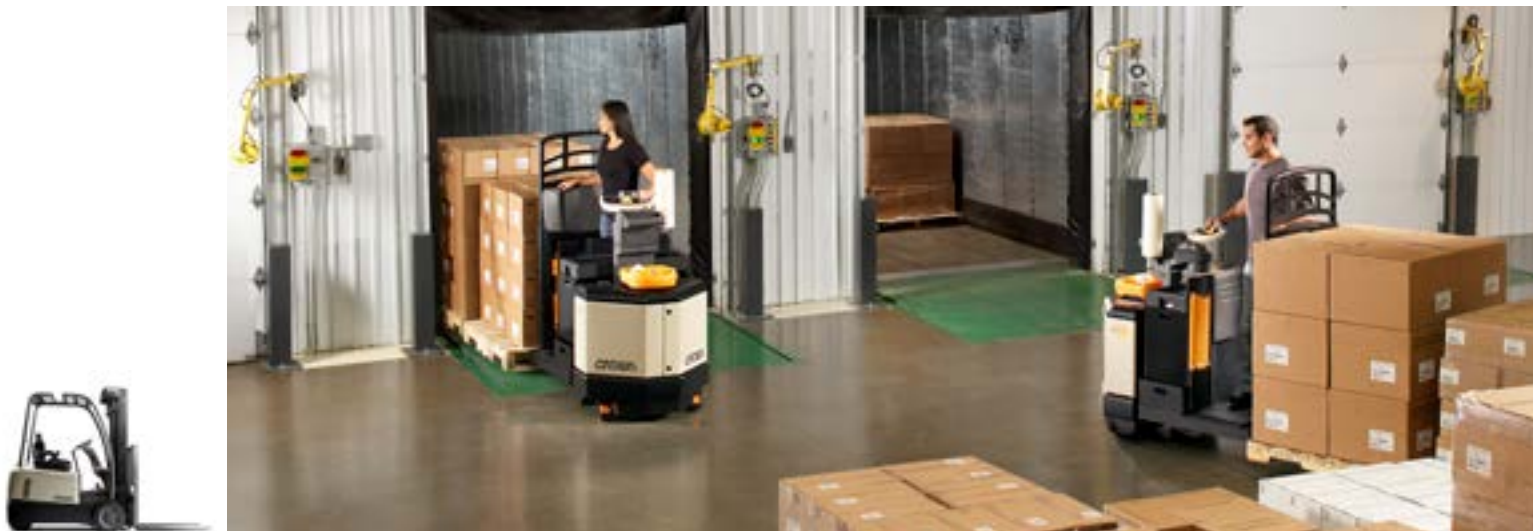




As the Internet of Things (IoT) continues to transform the way we interact with machines, data and each other, it is bringing a new level of connectivity that is evolving today's warehouses, distribution centers and manufacturing environments.

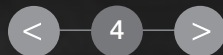
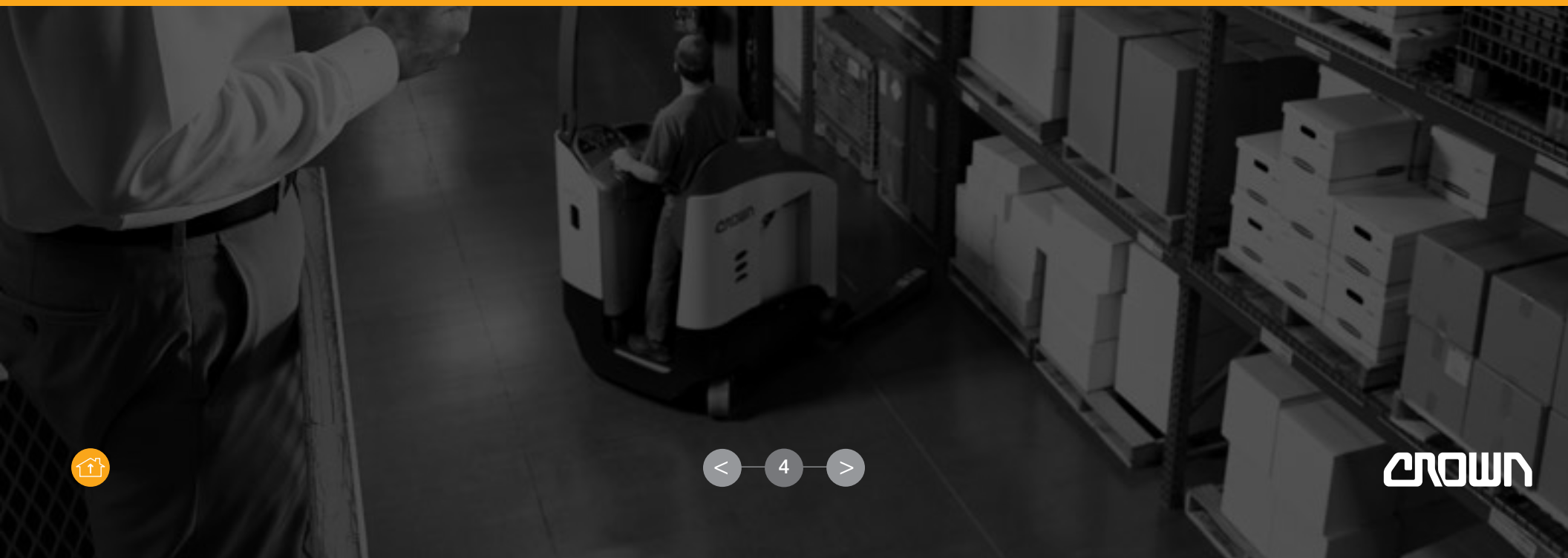
Crown Equipment envisions a connected facility where equipment, technology and people symbiotically work together in defined roles and take actions based on real-time and historical data to empower the supply chain to move products faster, easier and at lower costs to keep pace with changing customer demands and expectations.

The purpose of this e-book is to bring clarity, definition and insight to the connected facility of the future. Through discussions around introducing connected technology into the facility, preparing the workforce for connectivity, managing data and measuring progress, and maintaining safety as a priority, Crown Equipment seeks to help inform businesses working toward achieving a connected facility. Sections of this e-book will articulate what's possible now and provide a vision for what's possible in the future.





1 Introducing Connected Technology into your Facility



1 Introducing Connected Technology into your Facility



Do you suffer from Big Data Hype? Does the mere mention of the words “big data” or “connectivity” cause you to break out in a rash or hide under your desk clutching your business plan?

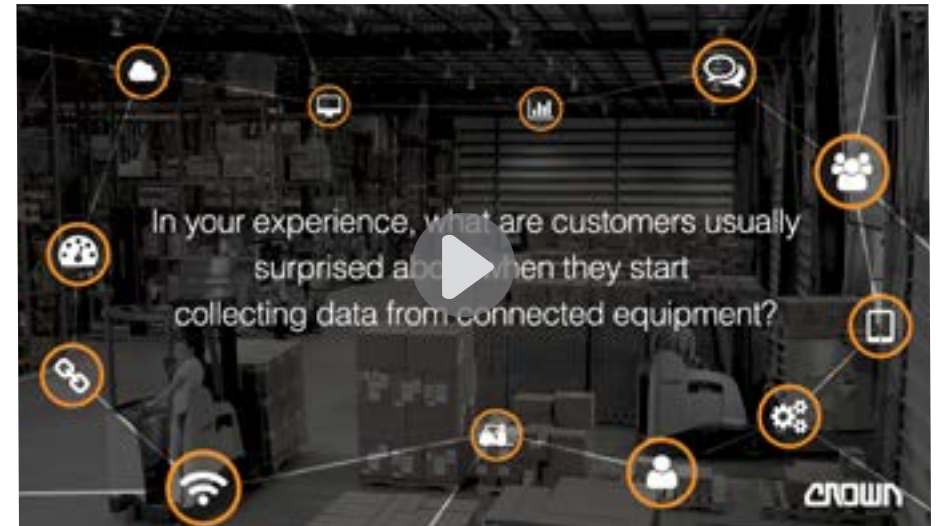
Don't worry, you are not alone. This is a common reaction shared by many supply chain professionals.

It's impossible to visit industry events and news sites without coming across at least one article or “expert” trumpeting Big Data or greater connectivity as the answer for everything that ails the world. It has been hailed as the perfect fix for every challenge and inefficiency found in the supply chain and warehouse.

Unfortunately, the hype is overshadowing the tangible benefits and business value tied to greater connectivity. This has resulted in a lot of confusion, frustration and false starts as pilot projects don't deliver on unrealistic claims or require more resources, time or dollars than initially suggested.

Much of this can be blamed on over promises and unrealistic expectations. However, it is also caused by a failure to help companies understand how to introduce connected technology into the facility, how best to manage the process to work toward measurable, obtainable goals and deliver value and how to identify, prioritize and act on the data that is gathered.

Crown Equipment is here to provide clarity to the idea of a connected facility and help you move beyond the hype. Making an investment in connectivity is important. While cost and complexity are valid concerns, when done correctly and deliberately, establishing and expanding connectivity within the facility can provide valuable visibility into your operation. Much of the technology involved is proven, relatively simple and available today.



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When you approach connectivity and Big Data with an informed and strategic focus, you can position your facility for future optimization and give your company a powerful tool to identify and resolve issues that drain productivity and hinder efficiency.

Defining a connected facility

So what is a connected facility? While this may seem like a very basic question, it's one that many people struggle with answering.

In simple terms, a connected facility enables you to shift away from individual components or equipment to a view that encompasses your entire facility and how its systems and components work together to deliver measurable business value.

In a connected facility, individual components no longer work independently. They are interconnected and communicate with other components and equipment. They work hand-in-hand with other systems and technologies to improve productivity, efficiency and safety.

Sensors, software and computing devices are embedded into these connected components, equipment and systems to enable them to collect, send and receive relevant data that can be used to provide greater understanding of your operations and make strategic decisions.

There is a wealth of data that can be gathered from the forklift, including data on operator performance, equipment status and health and product movement.

For instance, consider the forklift. Given its prominent role in the supply chain in enabling product movement, it provides an ideal starting point for your connectivity efforts.

There is a wealth of data that can be gathered from the forklift, including data on operator performance, equipment status and health and product movement.

You can gain a better understanding of when, where and how your fleet is operating, as well as identify those operators who are performing at the desired level and those who may need more training or coaching. Much of this information is available today with the technology that is currently on the market.



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Realizing tangible benefits

The key to realizing tangible benefits with greater connectivity is to establish clear goals prior to the project or implementation. If you are embarking on greater connectivity to solve a specific issue, you are more likely to succeed than if you scramble to determine value post-implementation.

An ideal approach for a phased implementation is to focus on operational objectives first. These objectives, usually “low-hanging fruit,” are often the most obtainable if you are looking to quickly show ROI or success. For instance, with



a connected forklift, these types of objectives usually revolve around compliance management, licensing issues and impact detection and reduction.

The greater connectivity can be used to reduce the number of manual processes, such as collecting compliance and certification information or digitizing the vehicle inspection process, to improve operational efficiency and consistency.

The information provided, if utilized properly, also can provide a window into operator performance. Through operator log-ins and important productivity metrics around travel time, lift time and idle time, you can measure and benchmark individual operators and groups.

Once you are proficient with operational objectives and seeing real improvement and ROI, you can move to other business objectives.

With the connected forklift, these business objectives usually revolve around fleet utilization, operator and truck productivity, and the size of the forklift fleet. They do require a more in-depth analysis of the data and a higher level of commitment and management time devoted to the task.

Unlike operational objectives, business objectives can involve significant changes to your operations based on what the data tells you. As a result,



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the ROI for these types of objectives is going to take more time to realize compared to ROI associated with operational objectives.

For example, you may not know how many forklifts are in operation or sitting idle in your facility at any given time. You may think you know, but our experience has shown that there's a good chance that your best guess may not be quite accurate.

With the visibility provided by greater connectivity, you will know this, as well as utilization and productivity levels. Armed with this information, you can make real decisions about the number and types of forklifts you have and better manage your resources and purchasing.

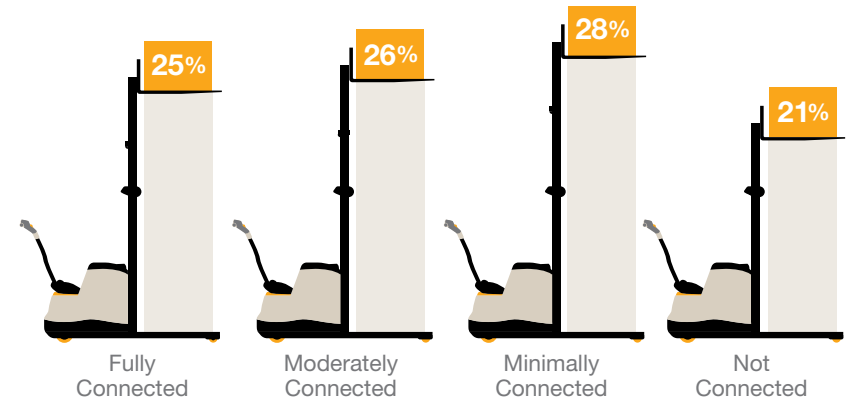
One significant benefit to a connected facility that is often overlooked is the valuable role it plays in helping you automate equipment and tasks within your warehouse and ensuring you get the most value from the technology, including reduced labor costs, increased throughput, controlled costs, increased facility flexibility and generated operational savings.

Essentially, you can't effectively be successful with automation without greater connectivity. It gives you the visibility into your operations you need to embark on the technology. It enables you to identify those tasks and equipment that

are ideal for automation, develop a clear path for tangible ROI and provides a platform for quickly and strategically growing and evolving your automation efforts. It eliminates the guesswork.

Without greater connectivity and the telematics it can provide, you do not really have an effective means for managing and controlling your automated fleet. Without the sharing of data and operational transparency how will you tell your automated vehicles where to go? How will you ensure they are going where they are supposed to go? How will you analyze your current operation to inform your future operation? How will you measure and quantify success?

How would you describe your level of facility connectivity?



Based on a Crown Equipment survey, most facilities could still do more when it comes to connectivity.



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Connectivity helps you answer all these questions and more when it comes to automation.

Greater connectivity is vital to the future of your operations and facility. It is important that you make the investment to position your operation for future optimization. The key to successfully embarking on your connectivity journey is ignoring the hype and focusing on the reality. Only then will you realize tangible benefits that deliver ROI and contribute to the success of your business.

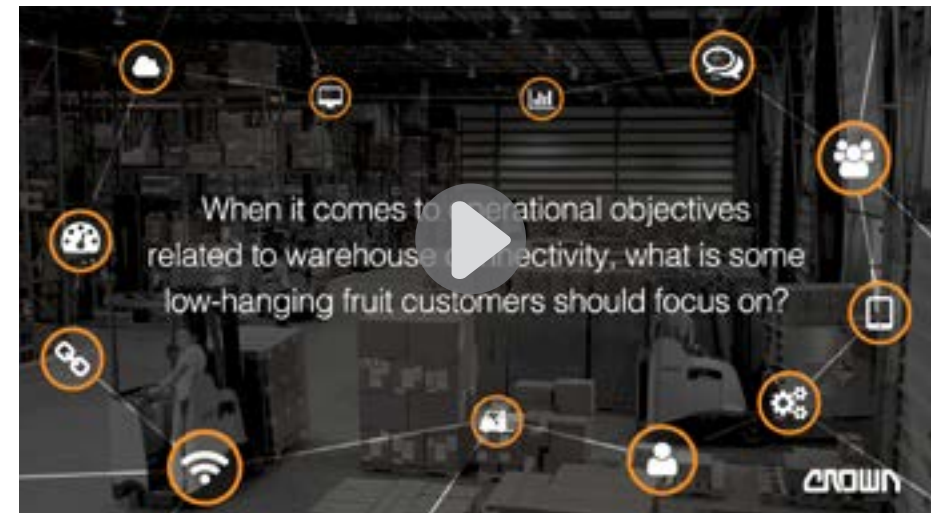
Taking a phased approach

So, how do you get started on your journey to a connected facility? After taking a deep breath and clearing all the hype from your head, the first important step is to plan your phased implementation approach.

Crown experts have led and participated in numerous technology implementations to promote greater connectivity that includes the forklift. We've seen what works and what doesn't, and the issues and challenges involved. We understand the dangers that may cause implementations to fail or encounter roadblocks. Based on that experience and insight, we always recommend taking a phased approach to implementation.

Think of it in terms of a 1,000-piece jigsaw puzzle of the New York City skyline. You dump all the pieces on the table and you quickly become overwhelmed and have no idea where to begin. The photo on the box shows gray buildings, blue sky and green space. But when you look at the table, all you see are 1,000 pieces containing disjointed fragments of the larger image.

The best way to get through this is to focus on a specific area or feature of the photo. For instance, most of the pieces with blue are going to be part of the sky; or most of the green will be part of Central Park. Once that area is finished, you move on to the next focus area or build onto your success by working on



1 Introducing Connected Technology into your Facility



the pieces directly connected to the finished area. Eventually you finish the puzzle and have a complete view of the New York City skyline.

While a little more complicated, you can approach your facility in much the same way: taking manageable, strategic steps and building on those accomplishments to get to the next step.



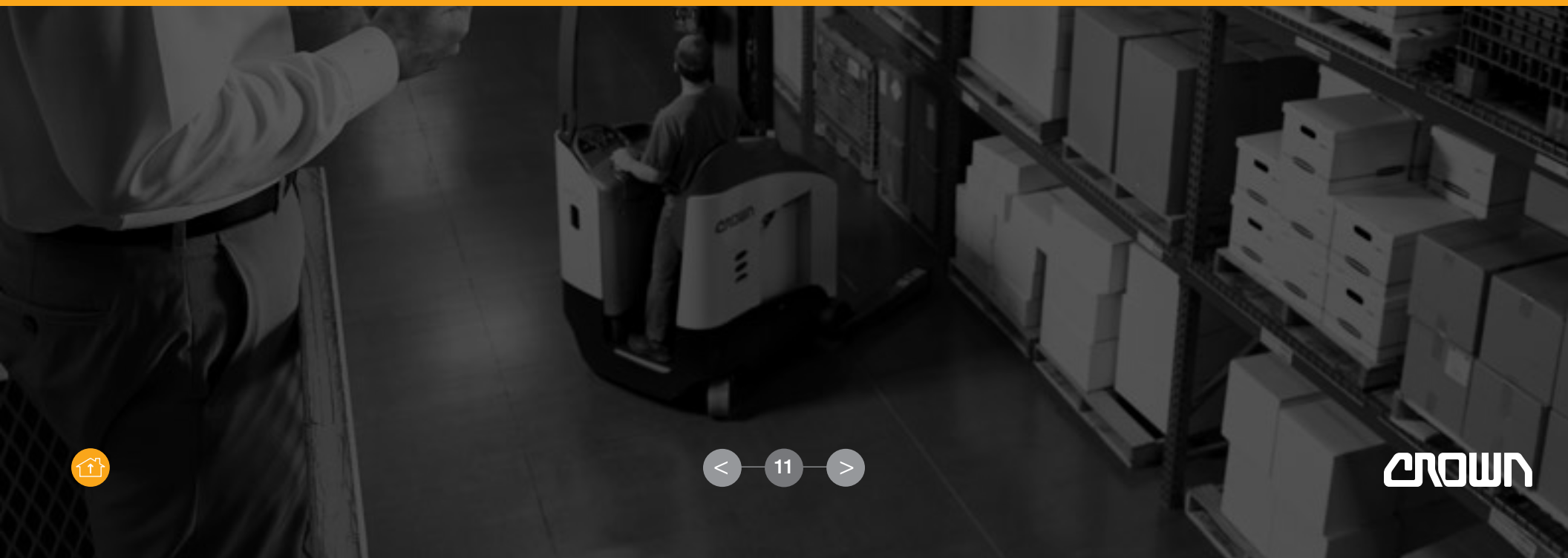
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In chapter 2 of our *“Achieving Material Handling Connectivity”* e-book we dive into the details around a phased implementation approach, including the steps and considerations involved. In subsequent chapters we will also take a look at the impact greater connectivity can have on your facility, including in the areas of service and maintenance, workforce and safety.





2 Taking a Phased Approach to Warehouse Connectivity



2 Taking a Phased Approach to Warehouse Connectivity

You've probably heard the saying: *if you can't measure it, you can't control it*. Well, a variation on that saying applies to warehouse equipment: *if you don't connect it, you can't control it*.

That's the principle underlying the connected warehouse. Connectivity unlocks the wealth of data within equipment such as forklifts, creating the visibility and control to optimize performance and automate processes. Who doesn't want that?

But, of course, the question is, at what price? Most of us have seen or heard of expensive technology projects that disrupted day-to-day operations and failed to deliver on their promised value.

That's a valid concern when it comes to large automation projects. But not connectivity.

Warehouse equipment can be connected with little or no disruption to existing operations (see page 18) and can deliver immediate value that grows over time. The key is taking a phased approach that is based on clear business objectives and builds on the successful experience of others.

It starts with understanding your goals and objectives.

Understanding Goals and Objectives

You're not going to implement new technology just because it's being hyped as the next big thing. You have business objectives you need to accomplish. If new technology can help you achieve those objectives, you should consider it. If it can't, why waste your time?

Warehouse connectivity can support a range of objectives, including:

- **Increasing efficiency:** Connectivity and the resulting digitization it enables allows you to automate manual processes, such as forklift pre-shift inspections, improving efficiency and accountability.
- **Enhancing safety:** With connectivity you can control access to ensure equipment is never operated without a proper inspection or by unauthorized personnel. What's more, connected equipment can alert you every time there is an impact, providing an opportunity to investigate the cause and implement corrective actions.
- **Improving productivity:** Forklift operators are one of your most valuable assets and their productivity is tied to the equipment they operate. Connectivity provides the data to measure and improve operator productivity, helping you understand why some operators are more productive than others and identify the best practices and additional training required to increase overall productivity.



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- **Optimizing utilization and uptime:** How many forklifts do you need at a certain site? That's a tough question to answer if you can't accurately measure utilization of your forklift fleet. Connectivity makes that possible. How healthy are your forklifts? When will they breakdown next? Connectivity also enables new approaches to service that reduce costs and increase uptime.

All of these benefits are attractive to virtually every warehouse operation. Like a kid in a candy store, it's hard to choose just one. But that can be a problem if objectives aren't prioritized early in the process. Some early adopters of

connected technology were challenged by a lack of focus. Without clearly established priorities they weren't able to quantify the short-term value of the technology, leading to some disillusionment.

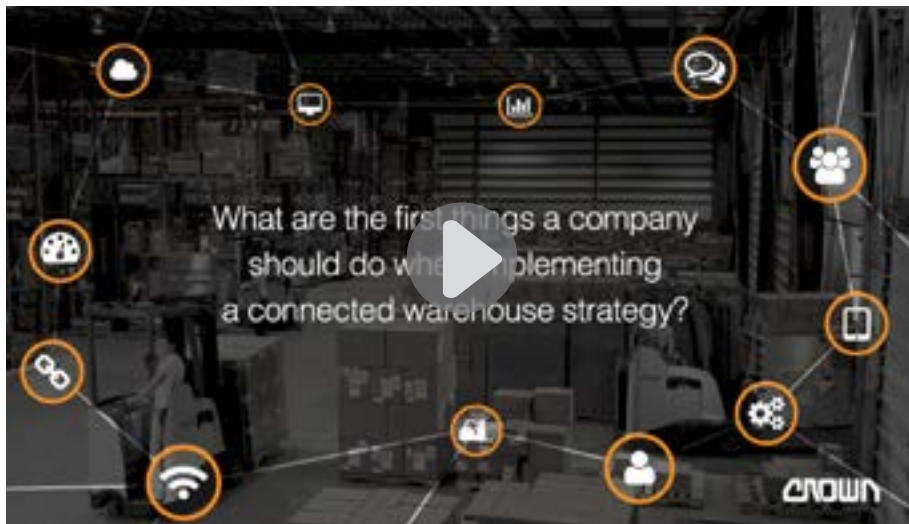
Focusing on a couple of key objectives during the early stages helps ensure everyone involved knows exactly what you're trying to accomplish, and that the data being collected supports those priorities. That doesn't mean abandoning all other benefits. Once you realize initial objectives, the program can—and should—be expanded.

Assessing Your Current State of Connectivity

So, you have clear business objectives and you're starting to get excited. But, what do you have to do to make connectivity a reality? From a technology perspective, it's simpler than you might expect.

There are three components to consider when assessing your current state of connectivity:

- **Warehouse network infrastructure:** One of the key decisions you must make is how data will be moved from equipment to the management system. Basically, you have two choices: cellular or wireless. Cellular can be implemented faster but limits the amount of data that can be collected. It may be suitable as an interim solution or for very small fleets, but Wi-Fi is preferable in most cases.



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If you already have a Wi-Fi network in the warehouse, you're a step ahead. Supporting real-time alerts does require good coverage throughout the warehouse, which may mean you'll need to expand your existing network. Your equipment provider can help determine the appropriate specifications for a Wi-Fi system robust enough to handle forklift connectivity as well as other warehouse communication requirements. It's also important to confirm with your IT organization that forklift data will be allowed to run on your Wi-Fi and resolve these issues before you engage with a connectivity supplier.

- **Forklift fleet:** Any forklift can be equipped with a communication device that allows hours and impacts to be communicated and this has some value in and of itself. But when the connected device can access truck operating data and event codes, the true potential of forklift connectivity is unlocked.

It isn't always necessary, or even feasible, for all trucks to be communication-ready at the beginning of a project. Working in a hybrid environment, in which some trucks are fully communication-enabled, and others are simply communicating usage, compliance and impacts, can deliver benefits. Over time you can add more communication-ready trucks through planned fleet refreshes, increasing the depth of data collected across the fleet.

- **Software:** A forklift fleet and operator management system is required to collect and present data to managers. In the case of Crown, this is our InfoLink® system, which is available as either an on-premise or cloud-based system (more on that later in this chapter).

The management system serves as the central repository for equipment operating data and should include an easy-to-navigate interface that provides a dashboard view of operations while enabling users to drill down into specific metrics.



2 Taking a Phased Approach to Warehouse Connectivity

You will eventually want to share data from this system with other warehouse systems, and vice versa, to get a more complete view of operator productivity and warehouse efficiency. When assessing your current state of connectivity, the best practice is to review other warehouse software systems and the data they are collecting so you can develop an integration strategy (more on this also later in this chapter).

A fourth overarching consideration when assessing connectivity readiness is data quality. You may find you have inconsistencies in how particular information is captured by different systems, making it difficult to share data. This can be as basic as how operator names are captured in different systems.

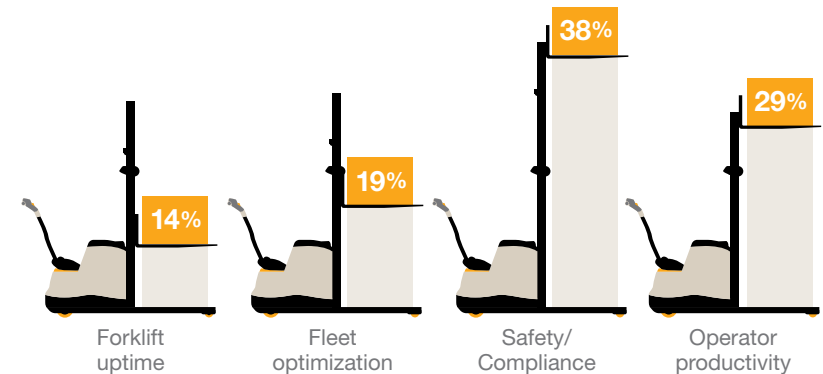
The human resource systems may list an operator as Robert Smith while the labor management system uses Bob Smith. When data is reconciled across the two systems, you'll have two operators named Smith.

This is an area where your prioritized goals will pay immediate dividends as they help focus data cleansing efforts. Clean your data!

Allocating Budget and Resources

Your project budget will depend on the number of forklifts being connected and your current state of connectivity. But, if you're thinking connectivity only makes sense for large forklift fleets, think again.

If you could improve one of the following, which would you choose to do first?



Connectivity is an inherently scalable proposition and we are seeing more customers with just a handful of trucks implementing effective connectivity solutions. Part of the reason for this is the emergence of off-premises, or cloud-based, hosting of the forklift fleet management software and subscription-based pricing systems.

This reduces the IT resources required to support implementation because it isn't necessary to set up and maintain a server on-site. Typically, the only IT support required in these cases is configuring the wireless network to securely provide data to the off-premises server.



2 Taking a Phased Approach to Warehouse Connectivity

The other advantage of a hosted solution in which software is provided as a service is that it reduces initial investment. This may allow you to fund the initiative from your operating budget, rather than going through an exhausting capital equipment approval process. In a subscription-based service, you pay an annual fee, rather than purchasing the software outright.

While IT support is minimal, the move to connectivity does require strong commitment from management. The most successful implementations have a “champion” within the organization who can liaise with technology vendors, ensure changes in processes are properly considered and communicated, and motivate managers to develop the habit of accessing the system regularly.

Also, evaluate the capabilities and resources of the solution provider. Choose a provider that is equipped to help onboard your organization and sustain results. This is best delivered through local technicians and specialists who can keep the technology working if problems arise and can share best practices from similar organizations and implementations.

Managing Data and Measuring Progress

It's likely you'll choose to start your connectivity journey with a single facility. That provides the opportunity to develop best practices—and begin to realize ROI – while ensuring data is clean before the program is expanded.

Choosing to start your connectivity journey with a single facility provides the opportunity to develop best practices.

During this initial phase, you'll want to focus on the basics: automating the inspection process, reducing impacts and right-sizing the fleet based on accurate utilization data.

Then, you can expand in two ways: rolling out the technology to other sites and diving deeper into the data.

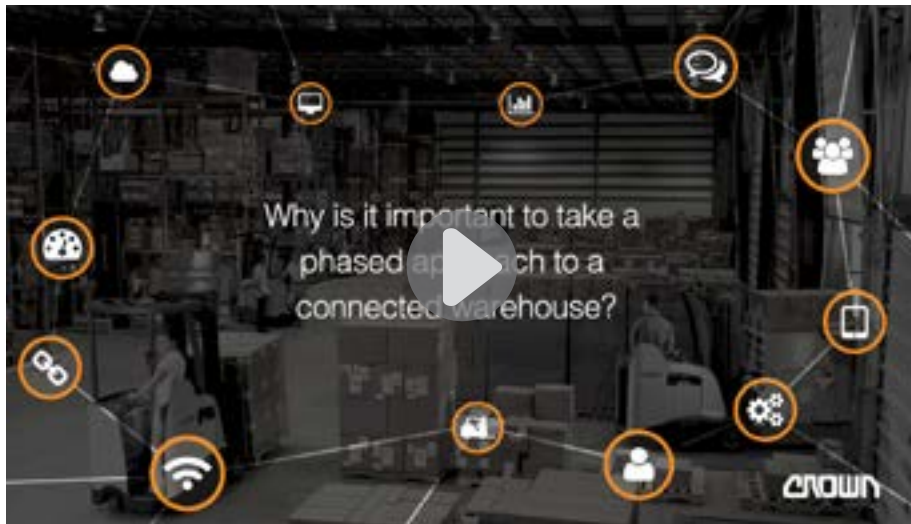
The longer the system is in operation, the more historical data you'll have to serve as a basis for optimization. It isn't always necessary to know exactly how you'll use all the data you are collecting right away, but it's still worth collecting. For example, you may not use truck travel data today, but tomorrow you may be asked to study the feasibility of automating some horizontal travel and suddenly that data becomes essential.



2 Taking a Phased Approach to Warehouse Connectivity

Getting connected is a great way to establish the baseline for future automation. To automate effectively, you'll need to know exactly how many "decisions" your forklift operators make on a second-by-second basis. If those decisions are to drive forward, backward and lift up and down at the exact same speed and distance, and no other decisions are required, you may be close to automation. If they have many decisions to make – speed up, slow down, turn left, lift, drive forward, lower, etc. – then getting connected gives you the insight to understand these decisions and how to address them through automation considerations. It all starts with connectivity.

As you expand your use of data, you'll discover opportunities to combine forklift data with data from other systems to gain deeper insights into operator productivity. That requires integration.



Integrating Systems and Software

Forklift fleet and operator management systems deliver value as a stand-alone system. But that value is magnified when forklift data is integrated with other product and operator data from enterprise resource planning, warehouse or work order management, labor management and human resources systems.

Once a time-intensive process, this integration now can typically be achieved quickly thanks to the development of standard application programming interfaces (APIs). They provide a ready-made way for different software programs to share data without the need for custom programming.

Through APIs, you can, for example, integrate the fleet and operator management system with human resources so it isn't necessary to enter new hire information in multiple systems (with the added benefit of ensuring naming conventions are standardized so you don't end up with separate records for Robert and Bob Smith).

Integration with product data from the WMS enables a more holistic view of operator productivity, supporting the development of custom reports or metrics. Data from these systems can also be used with business intelligence tools to support greater interactivity and analysis of warehouse data.



2 Taking a Phased Approach to Warehouse Connectivity

Not every organization will have the in-house resources to effectively manage and analyze data. If you're in that boat, look for a solution provider that can deliver data analytics services which include custom API integration. At Crown, we deliver these services through our Infolink Data Services team.

Building Momentum

The thing about momentum is that it starts with the first step. If you don't get off to a good start, you have to overcome inertia just to get moving.

That's why a phased approach to implementation, based on clear objectives and careful planning, is critical to the success of your connectivity initiative.

Demonstrating the value of the system through process automation, reductions in impacts and higher equipment utilization creates internal buy-in and provides the confidence to tackle more complex challenges in which data from connected equipment can be used to optimize processes and productivity.



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2 Taking a Phased Approach to Warehouse Connectivity

Getting Connected with Zero Disruption to Operations



Kane Is Able (KANE) is a leading 3PL with 6 million square feet of warehouse and distribution space in all major U.S. markets. Driven by the goals of enhancing productivity, safety and accountability, KANE represents one of the new breed of innovative companies turning to connectivity to improve operations.

Like many companies, KANE chose a limited deployment for its initial use of the technology. But it chose one of its most demanding distribution centers for that deployment. The company implemented Crown Equipment's InfoLink® forklift fleet and operator management system in one of its busiest distribution centers, an almost one-million-square-foot facility featuring a mix of narrow aisle and bulk storage space.

One of the keys to the success of the implementation, according to Jerry McMyne, Director of Operations & Support at Kane is Able, was the advance preparation. "Crown had a very detailed process, which included extensive communication between our team and theirs," he said. "They worked in a way that didn't affect our operations at all and once we were ready to go live it was very fast with zero hiccups. That gave everyone involved a lot more confidence in the system."

KANE also made sure equipment operators were included into the process. "This system was the focus of our stand-up meetings prior to every shift

for the first two weeks after it was installed, and Crown had a representative at every meeting," McMyne said. "That gave our operators a chance to ask questions based on their experience with the technology."

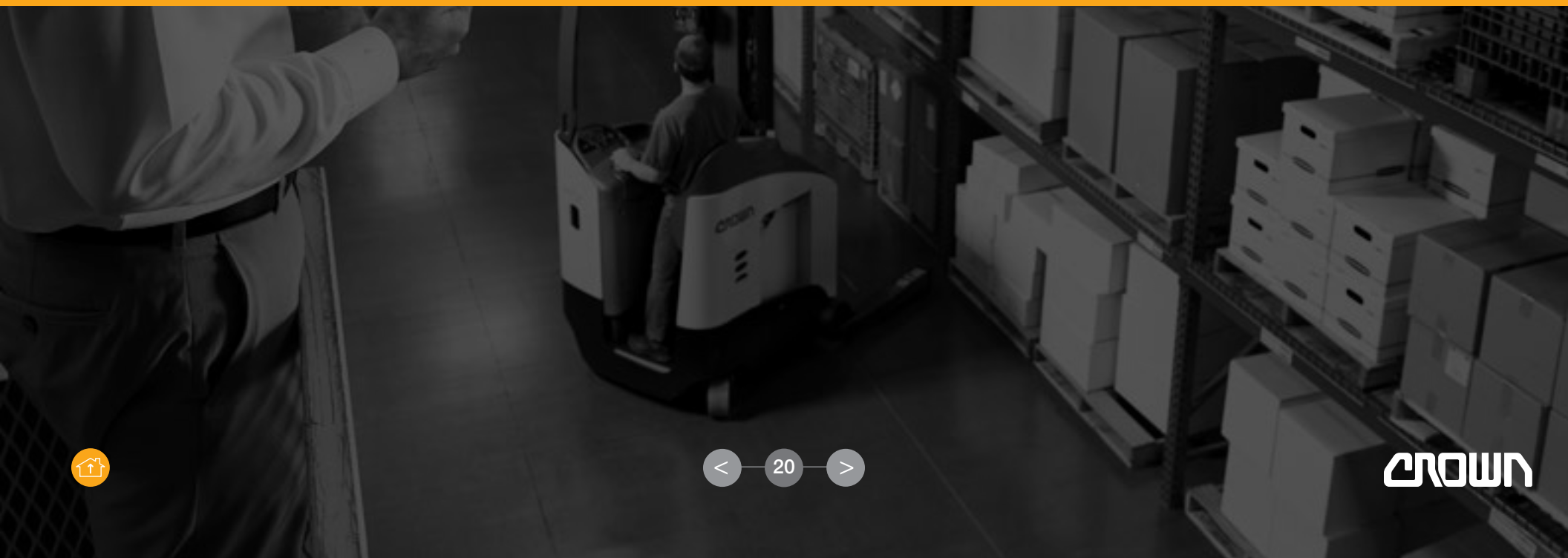
McMyne went on to explain that for most operators, particularly younger ones, the implementation of the connectivity solution was seen as natural. "They are using technology in every area of their life so why wouldn't they use it at work? We believe the system makes us a more attractive work environment for forklift operators, which are becoming harder to find."

Once everything was up and running – with zero disruptions to customer service – the focus shifted to using the data. McMyne and his team used data from the system to re-allocate 25 percent of the forklifts at that site to other locations where they were needed. They were also able to improve operator productivity and saw a significant reduction in damage to racks created by forklift impacts. All within the first six months of operation.





3 Expanding Connectivity to Service and Maintenance



3 Expanding Connectivity to Service and Maintenance



Imagine a world where your forklift tells you or your operator when there is a maintenance issue that needs to be addressed. Or the forklift itself automatically takes steps to prevent an issue from becoming more severe – and most likely, more expensive to fix.

Better yet, imagine the service technician shows up at your facility to fix your forklift before you realize there is a problem. The technician arrives understanding the issue and armed with the right part to make the repair, or a software update is delivered directly to the forklift to resolve the issue and shared with the rest of the fleet to prevent it from occurring with other forklifts.

Sound too good to be true? Are you more inclined to believe an army of elves will visit your facility and fix all your equipment while you sleep?

This is the promise greater connectivity brings to your service and maintenance programs. While we as an industry have not yet reached this point, there are major strides being made to create this connected experience. In fact, we are closer than you might think.

Regardless of whether you handle maintenance and service internally or work with an authorized dealer, there are opportunities now to realize a number of important forklift fleet maintenance benefits through greater connectivity.

The connected service technician

There is a growing breed of service technicians, armed with new technology and increased connectivity, that is helping make forklift service calls smarter and more proactive. These technicians are tech savvy and eager to learn. Many of them came of age in our connected world, with smart phones, social media and instant knowledge at their fingertips, so they understand the benefits of being connected.



The greatest asset these connected service technicians have is the large amount of data that greater connectivity allows you to gather on your equipment, including forklift performance, operation and health. This is why it is so important that you first connect your assets and have processes in place to monitor and analyze the collected data.



3 Expanding Connectivity to Service and Maintenance



Armed with laptops and tablets, these service techs can then access that performance data and analytics, including event codes, to provide insight and better understanding for the service call. These same tools can even be used to walk technicians through troubleshooting and the steps to more quickly fix the issue.

The maintenance data from the service call can then be uploaded to the service cloud, giving the fleet manager complete visibility to the maintenance issue and repair, and further strengthening the service data pool.

So, what does this look like in action?

Let's say an internal combustion forklift is overheating. An overheating alarm is sent to the dealer service dispatcher through the OEM's service cloud, along with information on the top issues that can cause this (based on historical data gathered). The dispatcher then decides which service tech, based on availability and on-hand replacement parts, is best suited for the service call. When the tech shows up and confirms the water pump is the issue, that information is added to the pool of data associated with overheating. The probability percentage for water pump is then increased slightly for future overheating alarms.



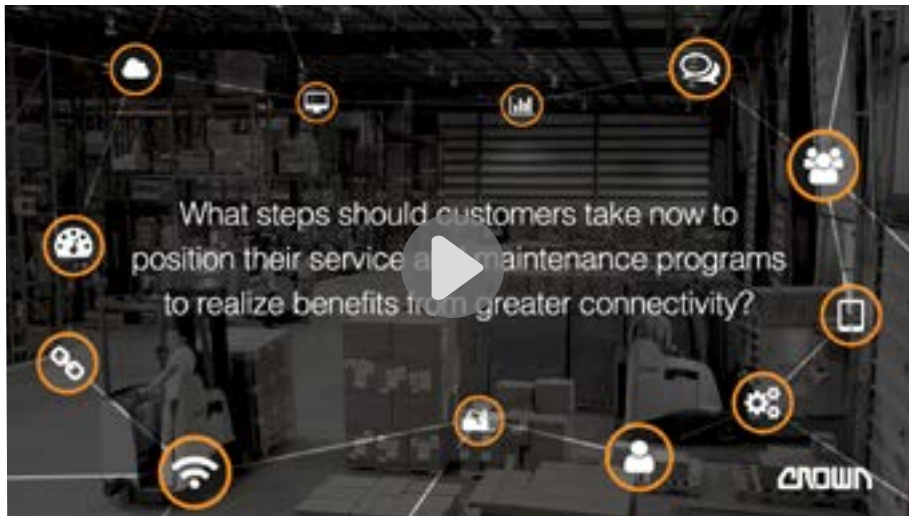
The dealer service manager also uses that historical data to better understand utilization and schedule regular service and maintenance, as well as create a proactive planned replacement product life cycle formula that is unique to the organization.

Connected service benefits

As greater connectivity transforms the equipment service experience, warehouse and supply chain executives are poised to realize a number of important forklift fleet maintenance benefits.



3 Expanding Connectivity to Service and Maintenance



1. Reduced downtime

When forklifts are not running, pallets are not moving. A connected service experience enables you to reduce unplanned downtime and the mean time to repair (MTTR). Event codes, forklift performance and health data help you be more proactive about repairs and recognize symptoms before they become a larger issue that results in downtime. Service techs use the actionable information to come to the site prepared to address the issue with the right part on hand, shortening MTTR.

2. Predictive maintenance

A connected service experience allows you to evolve your reactive service and maintenance program to a more predictive one. This includes using historical data to help diagnose potential causes of issues before the tech arrives onsite. It also means using that historical data to understand equipment operating trends and schedule service and maintenance to anticipate and eliminate potential issues. If historical data shows that a particular part wears out on a forklift after a certain number of operating hours, then managers can schedule replacement accordingly.

3. Hourly based planned maintenance

Currently, most planned maintenance schedules are based on the calendar, aligning equipment maintenance cycles and plotting quarterly, biannual or annual maintenance shutdown periods. While this method helps reduce downtime, it is often difficult to align all maintenance cycles. Armed with greater connectivity and actionable data, you can instead align planned maintenance schedules to the use cycle.

4. Visibility into service status

With today's equipment maintenance programs, it can often be difficult to monitor progress once a work order has been issued. Has the service tech been to the site? Is the issue resolved? Is there any follow up needed?



3 Expanding Connectivity to Service and Maintenance

It can be very frustrating. A connected service experience gives you greater visibility during every step of the process. Through established channels and processes, relevant information is shared, including when the tech showed up, what the issue was and how it was resolved.

In chapter 4 of our *Achieving Material Handling Connectivity* e-book we will focus on what greater connectivity means for your workforce and how you can help prepare them to thrive in a connected world.

5. Maintenance-by-the-Hour

A connected experience can even change how you structure your maintenance plan. Imagine designing a plan around how your facility actually uses the forklifts. Similar to the Power-by-the-Hour leasing concept, where customers only pay for the time they used the equipment, Maintenance-by-the-Hour aligns with your business model. With Maintenance-by-the-Hour, maintenance costs are based on equipment utilization, and maintenance schedules adapt to peaks and valleys in the business cycle.

As connectivity continues to increase in material handling, maintaining and servicing your equipment, such as forklifts, could be as simple and manageable as having work done on your car. To that end, forklift manufacturers such as Crown are working with customers to establish a connected service experience, which promises to enhance and transform your maintenance and service program.

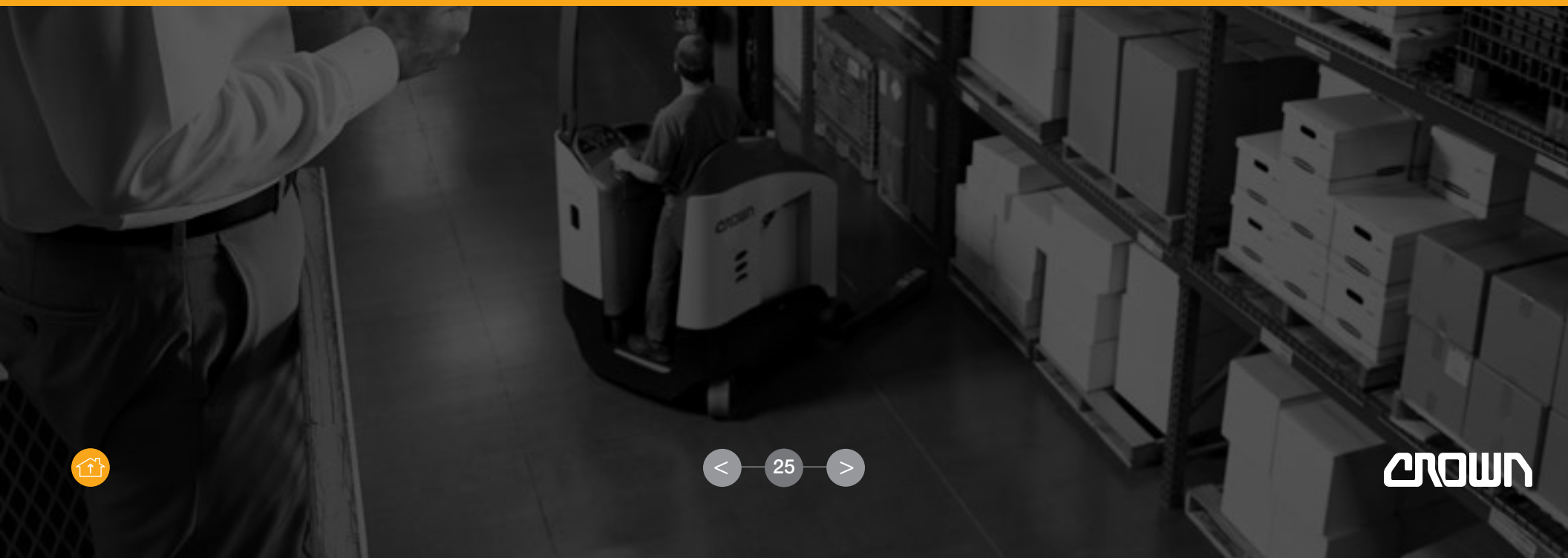


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4 Preparing the Workforce for Connectivity



4 Preparing the Workforce for Connectivity

Let's face it, almost no one likes change and that basic trait of human nature must be considered in any technology implementation.

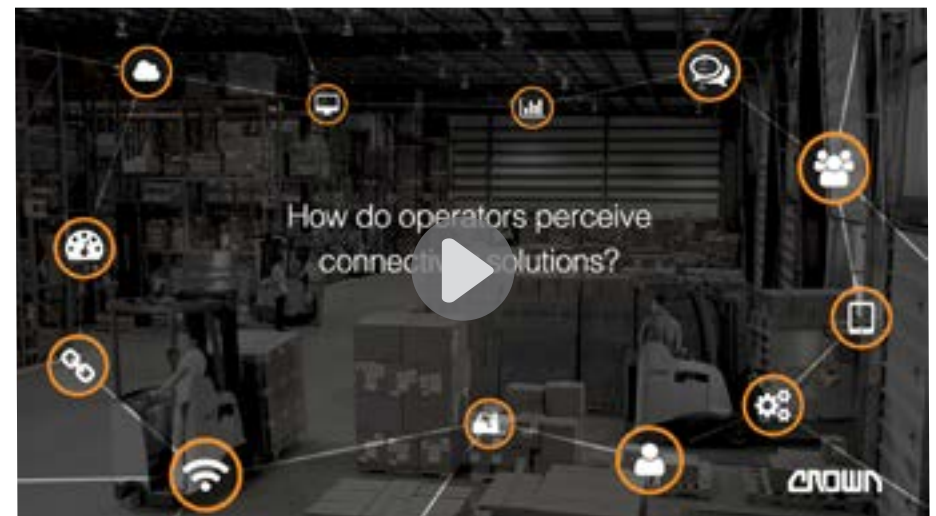
But, if properly implemented, new technology such as forklift connectivity creates long term benefits that outweigh the pain of the new responsibilities and procedures that accompany it. When managed properly, the initial reaction some workers may have to the changes introduced by connectivity can be effectively minimized and eventually eliminated as they gain an understanding of the value of the solution to the business.

So, what does it mean to manage properly? We've identified seven keys to implementing connectivity solutions to ensure a smooth transition, reduce employee resistance, and set the stage for long-term results.

1. Commit

Success begins with a commitment from the top levels of an organization to support the changes that will enable greater productivity, efficiency and safety. While the transition to—and continuing evolution of—warehouse connectivity can be relatively simple from a technology perspective, we don't want to undersell the importance of a focused management team and a culture committed to continuous improvement.

Don't embark on the path to connectivity if you aren't convinced of the value to your business. When business leaders and managers are ambivalent about new technology, operators and supervisors sense it and act accordingly.



2. Communicate

It's unsettling when new technology shows up with no forewarning. Operators may immediately think the worst and an important window of opportunity can close quickly.



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Instead, take advantage of regular team meetings to let your operators know what's coming and how it will help them. Don't be afraid to answer questions, address concerns and be frank about the changes the new technology will bring. And, while you need to communicate clearly, there's no reason to be defensive. A growing percentage of workers today have come of age in a digital society and are accepting of new technology. Many forklift operators, particularly younger ones, not only won't resist new technology, they'll embrace it.

Still, it's smart to expect resistance from some operators who may initially view connectivity as a move to "big brother" management. When educated about things like the elimination of paper checklists and the performance feedback a well-designed connectivity solution can deliver, that resistance

often turns into excitement. As one warehouse manager who implemented a forklift connectivity system shared with his Crown representative: "Our biggest skeptics prior to the implementation became our best advocates once they got a chance to use the system."

3. Plan

Challenges in the early stages of an implementation can occur when processes haven't been adapted to the changes connectivity enables. The ability of the truck to sense and communicate impacts may, for example, require changes in the impact reporting process that requires supervisors to respond more quickly. Paperless pre-inspection may mean managers are receiving electronic alerts when a truck fails inspection. Are they prepared to respond to equipment lockouts in a timely fashion? Are responsibilities clear and processes well understood?

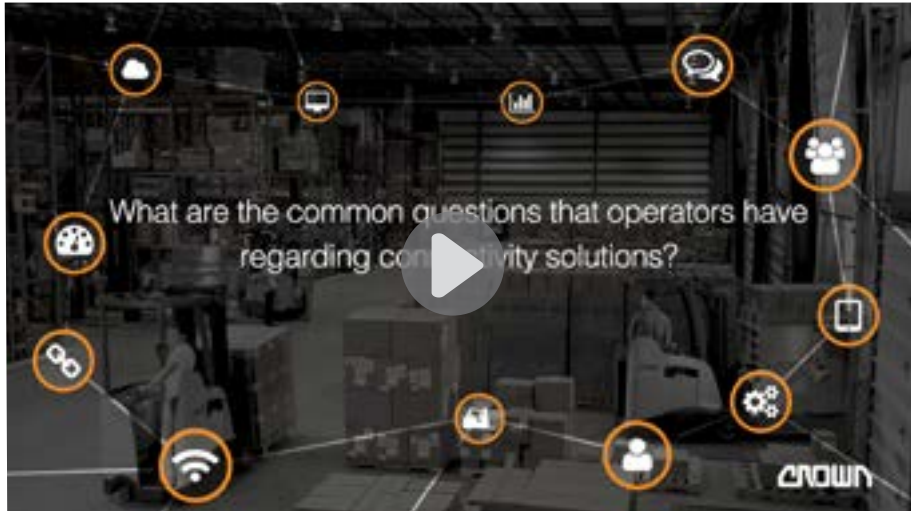
If processes aren't tailored to the functions of the connectivity solution, they can break down and operators, supervisors and managers alike get frustrated. Your connectivity provider should have the experience to help you understand the impact and re-engineer processes prior to equipment implementation. For instance, the RightStart™ program from Crown Equipment is designed to provide the support companies need to ensure process problems don't undermine the successful implementation of a connectivity solution.



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4. Train

Training is a key component of any implementation. Even solutions that are designed to be intuitive and easy to use benefit from training. Not only do operators, supervisors and managers get an introduction to the full capabilities of the system and practice using it, they can feel more a part of the process when they receive structured training from system experts.



5. Engage

What happens after training is often as important as what happens during training. Give operators an opportunity to ask questions and share experiences during the early stage of the implementation. It may take several weeks for operators to get comfortable with the system. Giving

them direct access to specialists from the technology provider during that period can ensure they become part of the process and are fully engaged in ensuring the solution delivers on its potential rather than fighting against it.

6. Monitor

Use of a connectivity solution can lose momentum when the initial glow of implementation starts to fade. Managers who were focused during the start-up phase may turn their attention to other issues, thinking that now that the system is up-and-running they are no longer needed. One of the biggest values of connectivity is the data it provides. If managers aren't using that data to reduce impacts, increase utilization and improve productivity, then the momentum built through a successful implementation isn't sustained and expected results can fail to materialize.

Maintaining the momentum requires accountability and positive feedback, with supervisors consistently responding with actionable steps that drive positive change. Periodic upstream reporting on data analysis and subsequent action steps sustains engagement and provides upper management with a window to system engagement levels.



4 Preparing the Workforce for Connectivity

7. Expand

Throughout this e-book, we've been focusing on the value of a phased approach to implementation. Virtually no implementation will achieve its full potential out of the gate. Create a plan to build on early success by tackling new business objectives or expanding connectivity to new sites. As you put in more hours on your system, you'll also begin to build an archive of historical data that can be used to optimize facility operations and help prepare for automation. Your technology provider should have services available to help you use the wealth of data you're now collecting.

The path to connectivity shouldn't be taken lightly, but neither should it be so daunting as to prevent you from moving forward. There is little doubt that connectivity is the foundation for the future of warehouse management and is now becoming commonplace in warehouses of all sizes.

Experienced technology providers have established processes for planning, training and engaging operators and supervisors that have proven effective at transforming resistance into acceptance. In fact, users of connectivity solutions have noted that these systems aid in the recruitment of operators and supervisors who use technology in every aspect of their lives and see an environment lacking in connectivity as one that is falling behind the times.

The workforce is probably more ready for connectivity than you expect. When leadership makes a commitment and focuses on training and engaging employees at all levels throughout the implementation, connectivity can be seamlessly integrated into warehouse processes and, before you know it, you'll have trouble remembering how you managed without it.

In chapter 5 of our *Achieving Material Handling Connectivity* e-book we will focus on how managers can maintain safety as a priority as they introduce connected technology and equipment into their facility.

 **3 STRATEGIES**
FOR REDUCING
TURNOVER AMONG
FORKLIFT OPERATORS >

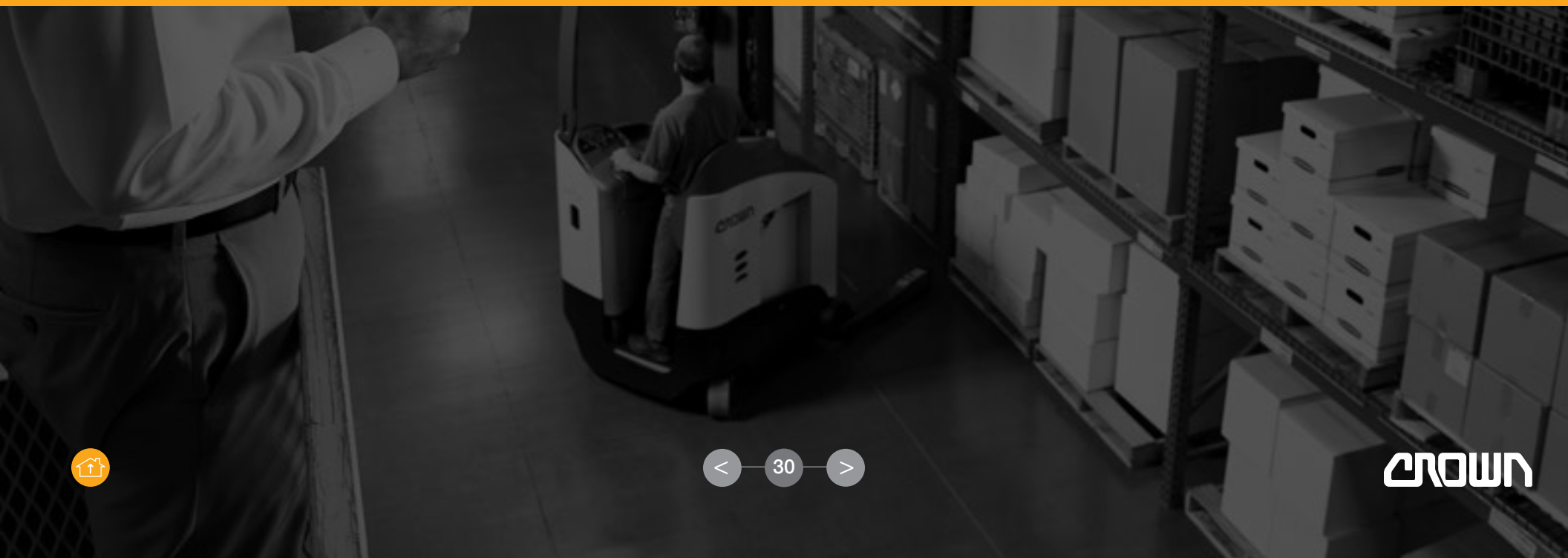
 **INTRODUCING TECH TO**
MATERIAL HANDLING:
CONSIDER THE
HUMAN ELEMENT >

TAKE THE SURVEY >





5 Maintaining Safety as a Priority



5 Maintaining Safety as a Priority

File this fact under “O” for obvious: Forklifts are heavy pieces of mobile equipment. And when they are carrying a full pallet load, often at high heights, they are even heavier.

This is why forklift safety is never casual or an afterthought. It is a priority. If your organization uses forklifts to move product in warehouse and distribution center environments you understand this. You and your organization invest the resources necessary to support a safety program designed to maintain safe working environments for forklift operators and other employees who work within the forklift environment.

But what you may not realize is that a connected facility, where components, equipment and people are interconnected, can be a valuable asset in building and maintaining a strong safety culture.

Greater connectivity's contribution to safety

When properly implemented and utilized to its fullest potential, greater connectivity can transform any safety program and boost safety initiatives to a whole new level. Think of it as Safety 2.0.

This is not hype. Remember, the purpose of this e-book is to provide clarity to the idea of a connected facility. To that purpose, here are four potential areas where safety benefits can be realized with greater connectivity.

1. Access control

Greater connectivity brings increased rigor and oversight to your compliance processes. Imagine being able to control access to the forklift to ensure only certified operators use the equipment. You can limit access to operators with the required certification and training and set forklift performance

SAFETY IS JOB NUMBER ONE

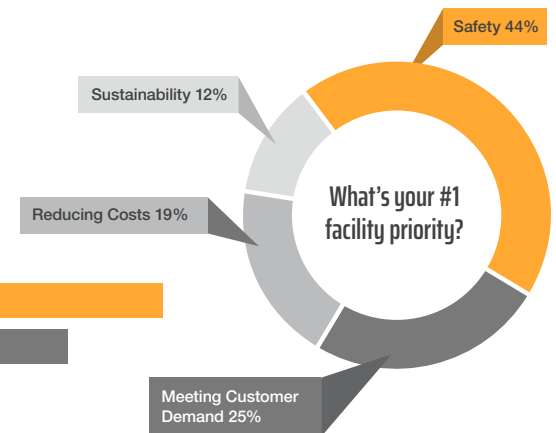
What's your #1 forklift safety goal for your operation?

Improve Operator Training 37%

Reduce Impacts 30%

Increase Compliance 18%

Track Fleet Condition 15%



parameters, such as speed limits, based on operator experience, training level or accident history. Electronic inspection checklists can guide operators through the vehicle inspection process, documenting that the process has been completed and the time it took.



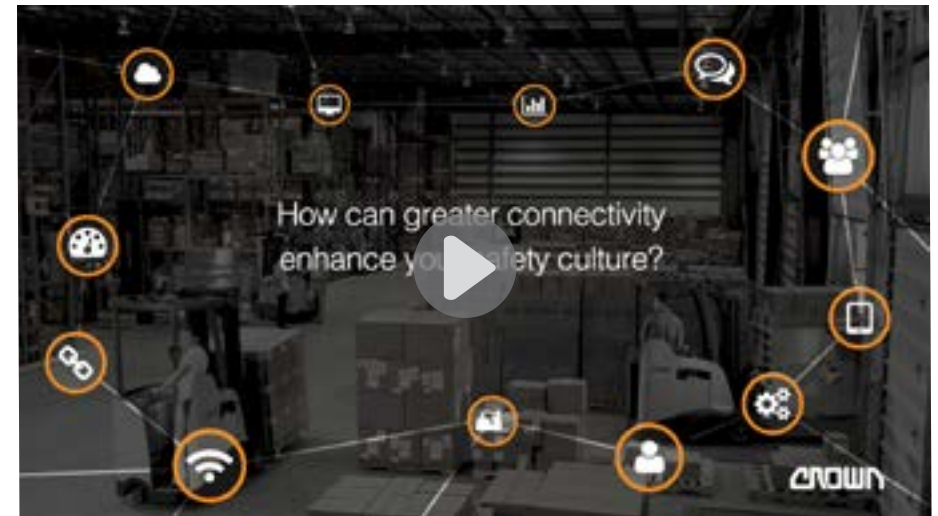
5 Maintaining Safety as a Priority

2. Impacts

It can be a little shocking when you analyze the number of forklift impacts in a typical warehouse objectively. In some facilities, 50 or more impacts a day are common and considered part of the cost of doing business. Unfortunately, that cost can often include damage to facility, equipment and product. That's a pretty big cost. Greater connectivity provides visibility that helps create an accurate picture of how, when and where impacts are occurring. Using the gathered data, you can identify areas of the facility where impacts are occurring and the operators who are involved. You can even receive real-time alerts so the incident can be immediately addressed.

3. Equipment and maintenance

In Chapter 3 we talked about how expanding connectivity to service and maintenance can reduce downtime and increase visibility into service status, while also enabling you to explore new ideas, such as predictive maintenance or hourly-based planned maintenance. It can also help increase safety. With digital checklists, equipment with safety issues can now be more easily identified and locked out. Alerts can be sent to maintenance supervisors letting them know about the issue. Also, given that greater connectivity provides greater understanding of how the trucks are being used, planned maintenance can more accurately be aligned with the business cycle.



4. Operator coaching and training

Dynamic Coaching™ is a term Crown has coined to refer to the delivery of real-time feedback to operators that reinforce correct behavior and recognize incorrect behavior. This can be in the form of context-sensitive visual and audible alerts delivered through the forklift display module to promote safety awareness. Think of it as a virtual onboard safety coach for each operator. For instance, an alert that reminds operators to wait until the vehicle comes to a complete stop if they start to exit too soon.



5 Maintaining Safety as a Priority

Plan to act

While this all sounds great (and it is), simply achieving greater connectivity doesn't guarantee you will realize safety benefits in these areas. It requires a mindset shift and action on your part. Here are five steps you can take using greater connectivity to create and maintain a strong safety culture.

1. Share insights based on data

The data and visibility provided by connectivity is empowering. Establish a plan and processes to share relevant information with peers, superiors and subordinates so that understanding and buy-in can be achieved and safety improvements made. Consider the types of alerts you want and how you will respond to safety issues.

2. Prioritize forklift startup

Inspection checklists help trained operators verify forklifts are in a safe condition to operate. Introduce an electronic inspection checklist that can be customized with unique questions and prompts to ensure operators appropriately inspect the truck. If there are operators who are not completing the checklists on time or correctly, you need to take appropriate action.

3. Test and learn

Greater connectivity enables you to collect a wealth of data to create an accurate picture of how the vehicle and operator are performing. Which operators are exhibiting unsafe behavior? Which areas of the facility see the most impacts? Use this data to make adjustments in training, maintenance and facility layout as needed to increase safety.

4. Offer feedback

The information provided also reduces subjectivity and creates an objective platform for using feedback as an instrument for operator coaching. This can either be real-time or on a set schedule. For instance, if data shows an operator has multiple, high threshold impacts, you can work with that operator to set specific goals or apply additional training.



5 Maintaining Safety as a Priority



5. Reward effort and achievement

Rewarding and encouraging operators who routinely exhibit safe behavior is just as important as identifying and coaching unsafe behavior. Setting and communicating team goals, and ultimately rewarding the behavior of the operators who reach those goals, can increase safety awareness and motivate operators to strive for continuous improvement.

Again, we cannot stress this enough. To realize tangible safety benefits you must act on the opportunities connectivity provides. These four areas and five steps are a good place to start. Creating a connected facility does not magically establish a safe working environment. Greater connectivity is not a replacement for forklift safety; but rather an enabler to new technologies and processes that help you strengthen your safety culture. The responsibility falls to you and your organization to take advantage of the opportunities.



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5 Maintaining Safety as a Priority

Connectivity Unleashes the Power of People

Northgate Markets understands how greater connectivity can reinforce a safety culture and help change the mindsets and behavior of forklift operators. The company recently achieved its lowest injury rate in the past 11 years. Keith McCarron, director of distribution for Northgate Markets, attributes much of that success to Crown Equipment's InfoLink® fleet and operator management system.

Located in Anaheim, CA, Northgate Market is a family owned and operated business that distributes fresh produce, meats and grocery items to 47 stores in the San Diego, Los Angeles and Orange County markets. Their 385,000 square-foot distribution center includes more than 100 pieces of material handling equipment, including reach trucks and pallet trucks with specific tasks. This equipment runs almost continuously throughout sixteen hour days.

Although the company had processes in place for gathering pre-shift safety inspection data, it struggled to get its operators to document



inspections and avoid impacts on a consistent basis. The company selected Crown's InfoLink to help make sure its operators were properly completing and documenting pre-shift inspections and monitor lift truck impacts to help modify operator behavior.

With pre-shift inspections now electronically

captured, operator compliance has risen from approximately 40 percent to virtually 100 percent. This ensures that every lift truck is operated only when it is safe to do so.

"I get a pre-trip on every piece of equipment that every individual gets on every day, period. It's one less thing I have to worry about," said McCarron.

McCarron and his managers also used InfoLink to establish individual impact thresholds for each truck and application, and used the impact notifications to help modify operator behavior.

"The ability to set each individual piece of equipment at a different threshold is key. If I have a guy loading, I can set him at a different threshold. If I have a guy outside doing pallets, I can set it at a different threshold. If I have a guy inside on a reach truck, it's the lowest threshold because our floors are smooth," said McCarron. "Now they are more aware of hitting the rack or bumping the pallet."



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