MODERN
MATERIALS HANDLING

MAKING
THE CASE

Unified Communications in Manufacturing

PEERLESS
CONTENT CREATION

MOTOROLA
SOLUTIONS

CONNECTED WORKERS:

The Competitive Edge in the Factory of the Future

While there are many technologies involved in digital manufacturing and Industry 4.0, putting a communications platform in place that connects front line workers with enterprise team members can help your organization excel.

Moving to digital manufacturing and digital supply chains promises enterprises new levels of speed, efficiency and flexibility because people, processes, and machines are better connected and more adaptive. However, to fully capitalize on these concepts, companies need to find ways to break down communications barriers between networks, devices and people.

Research shows that companies are adopting digital manufacturing and "Industry 4.0" capabilities, such as robotics, Internet of Things (IoT) applications, and machine learning and advanced analytics. For instance, according to a 2016 survey on Industry 4.0 by PwC, 33% of respondents said they've achieved advanced levels of digitization today, and 72% expect to achieve advanced levels by 2020.

Additionally, a 2016 study by Boston Consulting Group of Industry 4.0 among U.S. and German companies found that three-quarters of German respondents and two-thirds of U.S. respondents associate Industry 4.0 with increased productivity and cost reduction.

What steps should enterprises take to be prepared for this digital future? Many enterprises still struggle with disconnected systems. In many organizations, there remains a gulf between plant-floor systems and networks, and systems and networks used at the enterprise level.

While there are many technologies involved in digital manufacturing and Industry 4.0, one action companies can take to excel when implementing digital concepts is to put in place a communications platform that connects front line workers who generally use two-way radios with enterprise team members who oftentimes use mobile devices like smartphones.

In fact, according to the Motorola Solutions 2017 Manufacturing Communications Survey Report, 71% of manufacturers said it was important or very important to seamlessly connect all their communications devices.

"Today, you have networks and systems that are siloed, making it difficult to get information from one person who needs it to another," says Lester Miller,

commercial and launch marketing manager for Motorola Solutions. "The factory of the future may use plenty of automation, but many also will rely on people and devices to respond to events and alerts. As part of that, the factory of the future needs to be a place where information gets to people that need to know it much faster than happens today. You need to make sure that workers on the plant floor can easily communicate with each other, as well as with managers in the enterprise."

Front-line workers often rely on rugged, digital radio devices with push-to-talk (PTT) communications to communicate quickly and effectively with each other in harsh, loud environments, as well as with managers. Manufacturers seem to recognize these advantages as well, as Motorola's manufacturing communications research shows that PTT radios have seen a 29% increase in use since 2015.
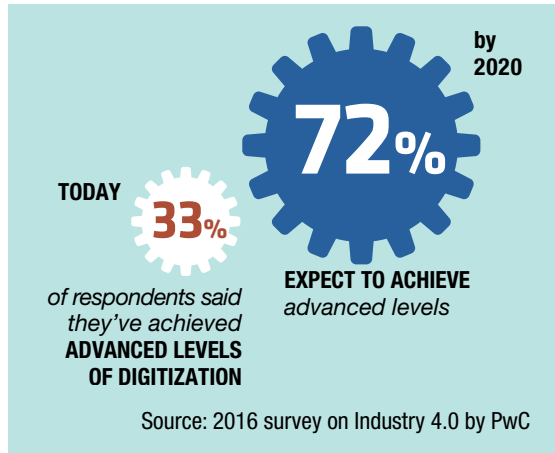
Motorola's manufacturing survey found that 78% of respondents are using multiple devices to communicate. This makes it necessary to enable a free flow of information between front-line workers and managers regardless of the device or devices of choice used by team members.

"When we talk to companies in the industry, we ask them about their pain points in communications," says Mark Cleverly, a strategic account director with Motorola Solutions. "We ask them, 'are you having to take extra steps in communicating? Are your people

TODAY

33%

of respondents said they've achieved **ADVANCED LEVELS OF DIGITIZATION**

by 2020

72%

EXPECT TO ACHIEVE *advanced levels*

Source: 2016 survey on Industry 4.0 by PwC

a way to communicate with other people in the enterprise to solve a problem, mitigate an issue, or enhance the response to an opportunity."

Delayed communication, notes Cleverly, is a critical issue when exceptions arise on the plant floor like unexpected machine downtime, work in process (WIP) materials or spares shortages, accidents, or other issues. These situations are the worst time to run into a communications barrier like unanswered voicemails, or lag times with email when trying to collaborate with managers as part of a rapid response.

Not only is lost productivity at stake when barriers exist between communication networks and devices, so too is operational performance. For instance, Motorola's manufacturing survey found that by connecting all their devices, 57% of respondents predict they could reduce downtime by 10% to 30%.

"There is greater immediacy required with plant-floor communications," Miller concludes. "You can't just leave a voicemail when a crucial situation crops up and hope for an eventual response because there might be production processes that stop,

> **"The factory of the future may use plenty of automation, but many also will rely on people and devices to respond to events and alerts. As part of that, the factory of the future needs to be a place where information gets to people that need to know it much faster than happens today."**
>
> — *Lester Miller, Commercial and Launch Marketing Manager, Motorola Solutions*

having to use multiple devices to try to accomplish what should really be single communications thread?' These front-line environments are dynamic, they may be harsh or noisy, so the front-line workers require devices that suit their needs, but still have

conditions that present an imminent safety risk, or the opportunity to enhance a process by making adjustments. Getting information and intelligence flowing to the right people on these critical issues is at the heart of connected communications."

Connected Communications Platform Drives Responsiveness

Workers on either side of the business—the front-line workers on the plant floor, or managers in office environments—can instantly respond to time-sensitive situations.
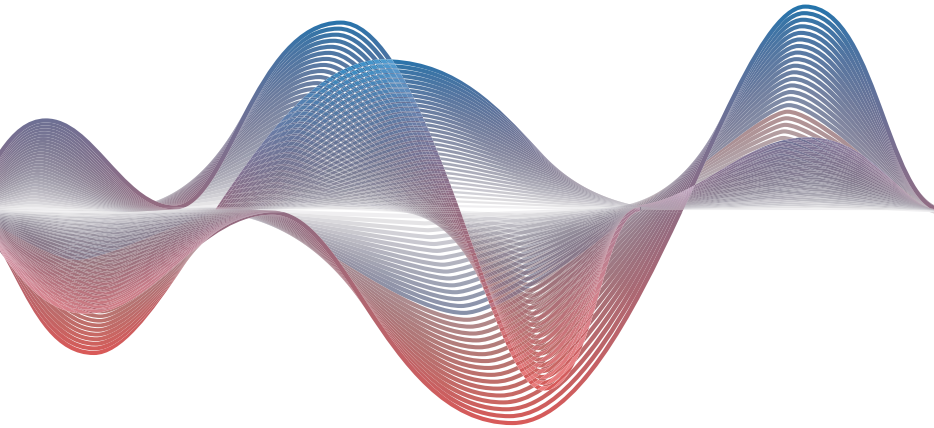
Concepts like digital manufacturing aren't strictly about technology, they're about running operations in a more intelligent, connected, and flexible way. The factory of the future, or the warehouse of the future, or the maintenance operations of the future are better because they're more cognizant of real-time changes in conditions or events, and thus more responsive.

Communications plays a central role in making the enterprise more responsive to changes in plant or logistics execution. While companies have made huge investments in plant-floor automation, manufacturing execution systems, maintenance systems, and more recently, Internet-of-Things (IoT) connected sensors and machinery, there may still be people who need to monitor these systems, respond to alerts, and coordinate the optimal response. Voice communications via mobile devices is essential to this rapid response.

A communications platform should ensure that people can connect across disparate devices and networks when exceptions arise, explains Lester Miller, commercial and launch marketing manager with Motorola. "To get information and intelligence flowing to the right people you need to break down those barriers," Miller says. "You need to eliminate the boundaries that typically exist between what type of device you're using, which network you're operating on, and where you're physically located. The power of our solution is that those boundaries go away."

Team Communications from Motorola Solutions is a Unified Workgroup Communication platform that enables industrial workers like those in the manufacturing space to communicate instantly, without boundaries and with added intelligence. With Workgroup Communications, a broadband push-to-talk application, managers who are in the office, travelling or at a customer site across the country, can communicate instantly and seamlessly with two-way radio users on the factory floor.

CONNECT MANUFACTURING TEAMS INSTANTLY ACROSS ANY NETWORK, DEVICE OR LOCATION
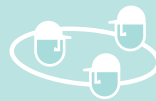
CONNECT EVERYONE…
Ensure anyone and everyone is connected, regardless of their device of choice or location

COMMUNICATE INSTANTLY
Front-line and field workers can communicate instantly with operations-critical two-way radio

…WITHOUT BOUNDARIES
Whether on-site or off-site, management, front line workers and field teams are always just a push away with Workgroup Communications

…AND WITH ADDED INTELLIGENCE
Use purpose-built apps designed for specific jobs and responsibilities for immediate team mobilization including dispatching, GPS location tracking and more

The cloud edition can be downloaded from the Apple or Google app stores and can leverage authorization data already configured for mobile users in directories, making it relatively simple to deploy. Additionally, it places team members into the right talk groups for more efficient communications, and to take advantage of additional app functions like dispatching and location tracking.

This communications platform allows front-line workers and managers to communicate instantly and seamlessly via push-to-talk on their device of choice. Using it a manager on a smartphone can respond to a problem like a material shortage or a machine outage, quickly authorizing fixes or alternatives. Workers on either side of the business— the front-line workers on the plant floor, or managers in office environments—can instantly respond to time-sensitive situations.

"No one has to give up the device they prefer, and everyone gets the speed they want in resolving problems," explains Mark Cleverly, a Motorola Solutions strategic account director. There are wide range of scenarios that can benefit, including:

• Resolving common plant-floor problems, like a shortage of material on a production line, or a machine that goes down or is producing too much scrap.

• While plant automation systems can generate alerts, sometimes the front-line workers on the floor who carry radios need to communicate quickly with managers on other networks and devices to resolve issues.

• Accidents or safety incidents that require immediate attention of management or safety directors.

• Maintenance issues that require rapid response, such as an unexpected spares shortage.

• Sudden changes in warehouse operations and transportation yards where gate assignments need to be switched on the fly or labor or dock equipment needs to quickly shift from one area to another.

"The value drivers for Team Communications will vary by operational challenge, but it's really about the smart management of time," says Cleverly. "It's about saving time and responding with solid information and intelligence. It's a way to bring the right people with the right knowledge into the communication flow to resolve issues."

If an organization lacks a unified approach to workgroup communications, time can be wasted trying to reach people via phone calls, email, or other means. At many facilities, that not only

> "The value drivers for Team Communications will vary by operational challenge, but it's really about the smart management of time. It's about saving time and responding with solid information and intelligence. It's a way to bring the right people with the right knowledge into the communication flow to resolve issues."
>
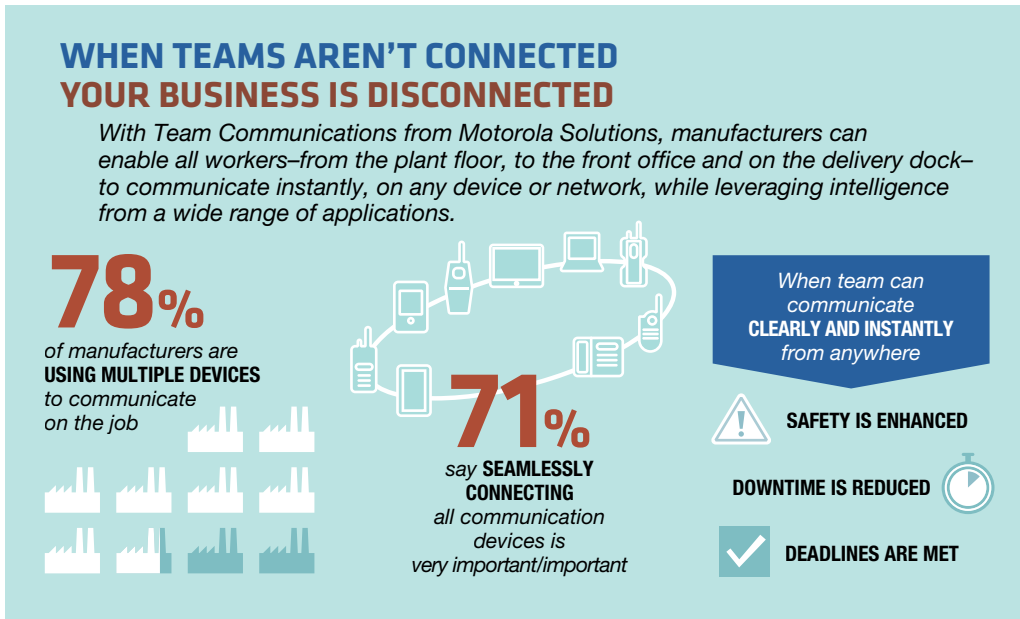> — *Mark Cleverly, a Motorola Solutions Strategic Account Director Motorola Solutions*

means wasted time for a worker, but unproductive time for valuable assets like production machinery, trucks, or trailers.

At one logistics facility, points out Jared West, a strategic account director with Motorola Solutions, Team Communications is making it easier to communicate with drivers and dynamically route trucks to gates, thereby creating efficiencies for drivers, and keeping truck assets busy moving goods.

At another company in the automotive sector, the app on smartphones gives maintenance workers the PTT communication capability, while allowing them to use the touchscreen on their phones to access visual repair information like schematics. "Team Communications can make a maintenance technician's job easier and more efficient by giving them PTT capability on their device of choice," says West.

frequency (RF) networks with the world of mobile device and mobile broadband and Internet Protocol (IP) communications, the platform also configures workgroups to support the free flow of intelligence. This voice-based relaying of intelligence is a vital element of the solution, explains Miller.

"The unified communications aspect is great, but the solution is really about the free flow of intelligence to those who need to use it or act

WHEN TEAMS AREN'T CONNECTED
YOUR BUSINESS IS DISCONNECTED

With Team Communications from Motorola Solutions, manufacturers can enable all workers–from the plant floor, to the front office and on the delivery dock–to communicate instantly, on any device or network, while leveraging intelligence from a wide range of applications.

78%
of manufacturers are **USING MULTIPLE DEVICES** *to communicate on the job*

71%
say **SEAMLESSLY CONNECTING** *all communication devices is very important/important*

When team can communicate **CLEARLY AND INSTANTLY** *from anywhere*

! **SAFETY IS ENHANCED**

DOWNTIME IS REDUCED

✓ **DEADLINES ARE MET**

Source: 2017 Motorola Solutions Manufacturing Communications Survey

The Team Communications platform can be deployed via the Cloud, and optional applications such as Advanced Desktop Communicator can provide a dispatch console solution. However, devices under Team Communications can also work in concert with dispatch functions from existing maintenance systems, facility management systems, or other existing plant-level software.

It's also possible to link the Team Communications platform with alerts coming from plant automation systems, plant history databases, Internet-of-Things (IoT) systems, or other front-line execution systems.

While the core of Team Communications is uniting the world of two-way radios and radio

on it," says Miller. "Think of the platform as having three fundamental elements: the ability to communicate instantly; without boundaries; and with added intelligence."

According to Miller, the "instant" element comes from the extension of PPT to non-radio mobile devices. The "no boundaries" benefit comes from uniting the worlds of radio and mobile broadband networks, which takes away the geographic boundaries. "And the third element—the 'added intelligence'— comes from tying into insights from IoT investments, from other plant-level systems, and from the people and devices on the front line. Those three elements combined are the power behind Team Communications."

Connected Communications Adds Velocity for Automotive Supplier

*The Implementation leads to
beneficial rapid response scenarios.*

THE ENVIRONMENT A Tier 2 automotive supplier in the metal stamping sector supplies various structural and sheet metal parts to Tier 1 suppliers who assemble interior systems, seating, and exterior components to vehicle OEMs.

This metal stamping manufacturer's plant-level systems include metal stamping machines with programmable logic controllers (PLCs) and touch screen interfaces to facilitate control, supervisory control & data acquisition (SCADA) software, a production management/shop floor control module for its enterprise resource planning (ERP) system, and a computerized maintenance management system (CMMS).

Team members in the plant environment include machine center operators, work center supervisors, maintenance technicians, receiving and shipping staff, an industrial engineer who handles machine programming, the plant manager, as well as onsite administrators involved in safety, logistics, and procurement processes. These employees use a mix of radios, smartphones, tablets, as well shop-floor touch screen PCs to facilitate communications, depending upon their role.

CHALLENGES

The company lacked a unified means of communicating among team members, who, depending on role, carried different types of devices. This required some team members to carry more than one device just to be able to communicate to handle exceptions, and in some cases, people had to be tracked down on foot by staff assigned to expedite a situation.

While the company's SCADA system, production management and maintenance systems are effective at controlling and managing shop-floor and machine maintenance processes, alerting mechanisms for these systems tended to be closed off to a few users per system, with no overarching voice communications platform to coordinate responses to alerts.

As a result, critical response workflows to issues like materials shortages, safety incidents, or unexpected machine downtime were too slow, leading to negative impacts like more downtime for assets and non-productive time for team members.

SOLUTION

The company implemented Team Communications from Motorola Solutions, including use of the push-to-talk app on non-radio devices. The communications platform was integrated with alerts from the CMMS, the ERP system, as well as from the SCADA system and plant-floor machinery. The company also upgraded some older radios used by some shop floor and materials handlers to newer digital units with features like text-to-speech and "man down" sensing which can detect of a radio has been horizontal for an unusual time period.

RESULTS

Using Team Communications, and the push-to-talk app, team members in all key roles can instantly communicate on their device of choice, speeding up response times to a variety of exception conditions. Additionally, by integrating the communications platform with alerts from the plant-floor execution systems and PLC-controlled machinery, response flows to alerts from these systems are enabled across all key roles and mobile device types.

As a result, there's less time spent trying to track down people who need to respond to exception conditions. Machine downtime has been reduced since implementing

the solution, thanks in part to rapid voice communication across user roles and radio and non-radio mobile devices.

While there have been no "man-down" incidents since deploying the new radios, the text-to-speech function in the new units is helping lift drivers and other operators with the new radios be more productive.

RAPID RESPONSE SCENARIO 1

A critical raw materials shipment needs to be rushed to a work center to replenish a machine running low on materials, so the logistics manager pushes an alert to a materials handler in receiving, who "hears" the instruction to bring the pallet of materials directly to the work center in question.

RAPID RESPONSE SCENARIO 2

A PLC on a machine on the production floor is showing a trend toward excess scrap on the machine. This triggers an alarm in the control software, which is transmitted to a maintenance technician who uses a smartphone. Using the push-to-talk app on the phone, the technician can immediately talk to the work center supervisor about when the machine can be serviced, while using the smartphone to enter the necessary work order information into the maintenance system.

RAPID RESPONSE SCENARIO 3

A cleaning solution container spills in a storage area, necessitating response from team members in various roles. Thanks to the push-to-talk app and Team Communications platform, the worker who spots the spill can use a radio to call the safety director who uses the app on a tablet. Quick communication and identification of the spilled material allows the safety director to confirm that a Hazmat team is not needed, while ordering the proper cleanup process to begin.

Connected Communications Drive Benefits Across Team Roles

Removing communication bottlenecks brings benefits to an organization that range from reducing the frustration level for individuals trying to track down the right person to respond to an exception, to driving efficiency for the organization as a whole. The benefits experienced from unified communications vary by job function.

FOR SENIOR EXECUTIVES OR ANYONE RESPONSIBLE FOR PERFORMANCE, faster communication equals increased productivity, which in turn drives corporate performance. For workers on the front-line, connected communications cut back on the frustration level in struggling to respond to events, safety issues, or exceptions on fast-paced shop floors, facility or logistics settings.

"For those working in front-line environments, connected communications is all about pain alleviation," says Lester Miller commercial and launch marketing manager with Motorola Solutions. "Team Communications takes away the frustration factor from the inability to communicate with the people you need to, or trying to figure out what device to utilize, when what you really need is a quick response to a situation. When you ask front-line workers what their top frustrations are, it often comes back to 'somebody, somewhere in the organization knew what I needed to know to deal with a situation, but I could not get to that person.'"

By uniting team members who use two-way radios on radio frequency (RF) networks with those who use other mobile devices and might be located well outside the RF network, Team Communications facilitates rapid, effective communication. By organizing the makeup of who is involved in workgroups, Team Communications ensures intelligence generated from plant floor automation, machinery, or Industry Internet of Things (IIoT) systems gets conveyed to the right people quickly.
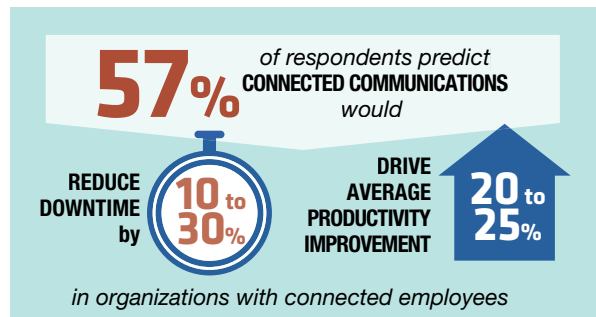
A Motorola survey found that 57% of respondents predict connected communications would reduce downtime by 10% to 30%, while also driving a 20% to 25% average productivity improvement in organizations with connected employees. For senior leaders, this enhanced productivity is the main appeal for unified team communications.

"By breaking down the boundaries between different groups of workers, you're enabling key people to communicate, which streamlines operations and brings efficiency to critical responses, while also enhancing safety and reducing risk for the enterprise," says Miller.

Executives also like the fact that Team Communications works on top of multiple existing device types and helps exploit the insights with alerts coming from plant-level systems or IIoT investments, adds Miller. A recent Motorola Solutions survey for manufacturers found that 25 percent are investing in IIoT, so the need for human responsiveness to what these systems spot is likely to increase.

"Part of the power of Team Communications is that it helps you fully leverage existing investments by speeding up communications around the intelligence coming from the plant floor and knitting together existing networks," says Miller.

57% *of respondents predict* **CONNECTED COMMUNICATIONS** *would*

REDUCE DOWNTIME by **10 to 30%**

DRIVE AVERAGE PRODUCTIVITY IMPROVEMENT **20 to 25%**

in organizations with connected employees

Source: 2017 Motorola Solutions Manufacturing Communications Survey

THE BENEFITS OF UNIFIED TEAM COMMUNICATIONS ALSO ARE TWO-FOLD FOR INFORMATION TECHNOLOGY (IT) MANAGERS. For one, since the server component has a Cloud deployment option and one of its key applications, the push-to-talk app, can be downloaded by users from the Apple or Google app stores, the IT effort involved in deploying the solution is reduced.

More strategically for IT leaders, Team Communications ensure that investments made in execution and operations software doesn't run up against communication barriers in exception management. For example, use of Team Communications can ensure that when an alert is being dealt with by a person using a two-way radio, that worker doesn't run into a communications dead end when trying to coordinate with managers in the enterprise.

"Part of the power of Team Communications is that it helps you fully leverage existing investments by speeding up communications around the intelligence coming from the plant floor and knitting together existing networks."

— Lester Miller, Commercial and Launch Marketing Manager, Motorola Solutions

This tying together of exception handling workflows from existing plant-level systems to networks, systems and managers at the enterprise level can be seen as a "Factory of the Future" improvement initiative. Not a rip and replace of previous investments, but rather a way of making existing systems work better together to respond to conditions in a highly agile way.

"IT leaders don't want to overlook a solution that will speed up crucial responses and workflows that tie back to systems they've already invested in," Miller says. "Team Communications is not forcing a new device type on organizations, and it's not simply about communications. It's about optimizing the organization's critical workflows."

CONNECTED BENEFITS BY ROLE

SENIOR EXECUTIVES

Enhanced productivity in reacting to critical issues like downtime or safety incidents, thus improving performance. Greater leveraging of intelligence and alerts being generated by previous investments in plant level systems and IIoT.

FRONT-LINE WORKERS

The ability to keep using the device type that best suits your role and environment—a two-way radio— while being able to instantly talk with managers on non-radio devices. This core benefit greatly lowers the frustration factor in not being able to reach the right people with the intelligence needed to solve problems. Perhaps most important, less wasted time for frontline workers by eliminating communications gaps means they have more time to devote to the production and fulfillment tasks that drive revenue for the company.

PLANT MANAGERS AND OTHER OPERATIONS MANAGERS

Ease of communicating with front-line workers using a push-to-talk app on a two-way radio, smartphone or other devices.

IT LEADERS

Lower IT overhead in deploying unified team communications thanks to using existing infrastructure and leveraging cloud deployments where possible.

Faster, Connected Communications Drives Productivity, Unlocks Intelligence

FOR ALL THE PLANNING AND ANALYTICS that play into the success of an organization, executing well in operations is a make or break issue for enterprises. If you have excellence and speed in the way you respond to exceptions, stock outs, safety or downtime events, you're going to be a more successful company.

The Team Communications platform for connected, unified communications removes some of those final barriers that can get in the way of operational excellence, explains Lester Miller, commercial and launch marketing manager with Motorola Solutions.

"We spend considerable time talking to users about breaking down communications barriers, and while it's wonderful to eliminate those barriers, it's not just about being able to ping each other across device types and networks," says Miller. "The real benefits come from removing bottlenecks to response workflows, and speed in dealing with exception events that come from existing investments. In short, our solution helps ensure that intelligence can immediately flow to the right people so that they can respond in the best way."

Unified, connected communications can drive a 20% to 25% improvement in productivity. The processes that could be improved include:

- *Faster, better coordinated response to safety events or accidents.*

- *Quicker voice communications with machine downtime issues or maintenance-related exceptions like spares shortages.*

- *Faster voice communications in warehouse setting or transportation yards to do things like reroute truck assets, or quickly shift labor resources.*

- *Alerts generated by investments in plant-floor automation, manufacturing execution systems, maintenance and facility management systems are dealt with faster and more efficiently. For instance, by connecting all their devices, 57% of companies surveyed by Motorola Solutions predict downtime can be cut by 10% to 30%.*

> "The real benefits come from removing bottlenecks to response workflows, and speed in dealing with exception events that come from existing investments. In short, our solution helps ensure that intelligence can immediately flow to the right people so that they can respond in the best way."

— *Lester Miller, Commercial and Launch Marketing Manager, Motorola Solutions*

The solution for connected team communications is more than updated device hardware, or simply a push-to-talk app for mobile devices. It's a unified team communications platform that lets an enterprise collaborate around critical operational events.

What's more, since one option for implementation is on-Cloud, and on-premise deployments can be managed in a relatively short time frame leveraging existing data for device users, the solution has a low barrier of entry. It can also link to existing alerts from plant level systems or connected, smart machinery, accelerating problem resolution without duplicating efforts.

"With Team Communications, your people can keep the device that makes the most sense for their roles, regardless of network, and with our app on mobile devices, there are no geographic boundaries, so regardless of where team members are, they can communicate with immediacy," concludes Miller. "This unified approach lets them share the intelligence that needs to be shared to resolve issues quickly."

To learn more about Unified Team Communications for Manufacturing,
visit https://www.motorolasolutions.com/en_xl/solutions/manufacturing.html