

EBOOK

Digital Transformation in Building Materials: Setting Your Digital Foundation by Connecting Your Workforce

How people-centric digital transformation unlocks long-term success in the building materials industry.



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INTRODUCTION

From steel rebar to multiaxial fabrics, the building materials industry encompasses an incredibly diverse array of products used in residential and commercial construction. Our built world is made up of thousands of different building materials, each with its own unique properties and functions in maintaining safe and comfortable environments.

High-quality materials require high-quality production — a fact that manufacturers of building materials know all too well. But consistently producing top-quality products is only one of many challenges building materials manufacturers face today. For instance, during the pandemic, fewer people are buying homes worldwide. Now, the home-buying demand is growing once again, spurring building materials plants to ramp up production.

Moreover, supply chain disruptions and fluctuations in the price of raw materials add extra layers of complexity to an already challenge-ridden industry. But building materials manufacturers that thrive despite current economic conditions have a major advantage in common — and that is digitized manufacturing operations.

In this eBook, we'll uncover how digital transformation helps building materials manufacturers maintain healthy profit margins as well as why technology-enabled workers are key in driving their success.



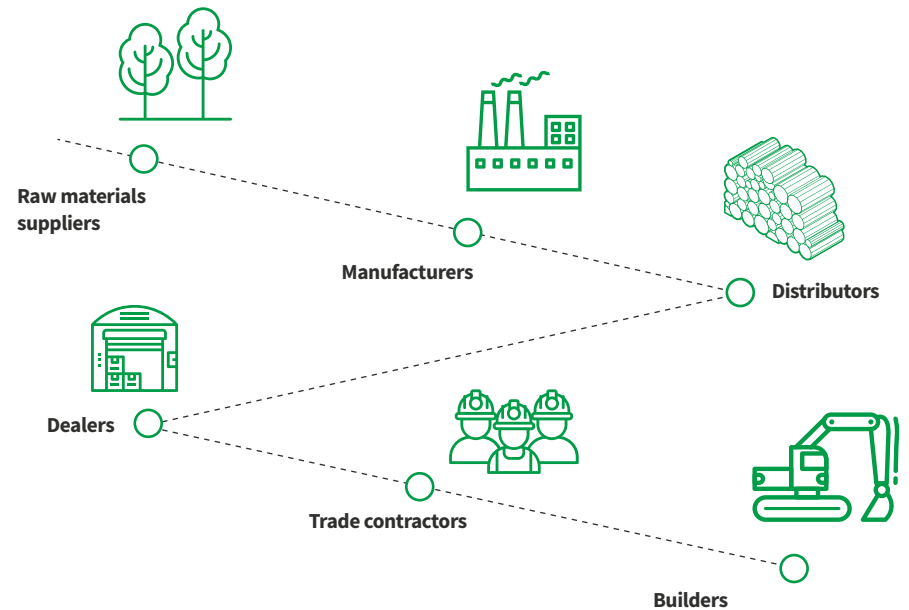
SECTOR SUMMARY: THE BUILDING MATERIALS INDUSTRY

The building materials industry is often confused with the construction and building products industries. While building materials manufacturing is part of the same supply chain, it has the distinct function of turning raw materials, such as timber, metals, and chemicals, into usable components like lumber, steel studs, and plastic sheets. These components are often sold to original equipment manufacturers (OEMs) for conversion into more detailed products, such as windows and doors. Building materials are typically sold to distributors before reaching the hands of contractors, builders, and so on.

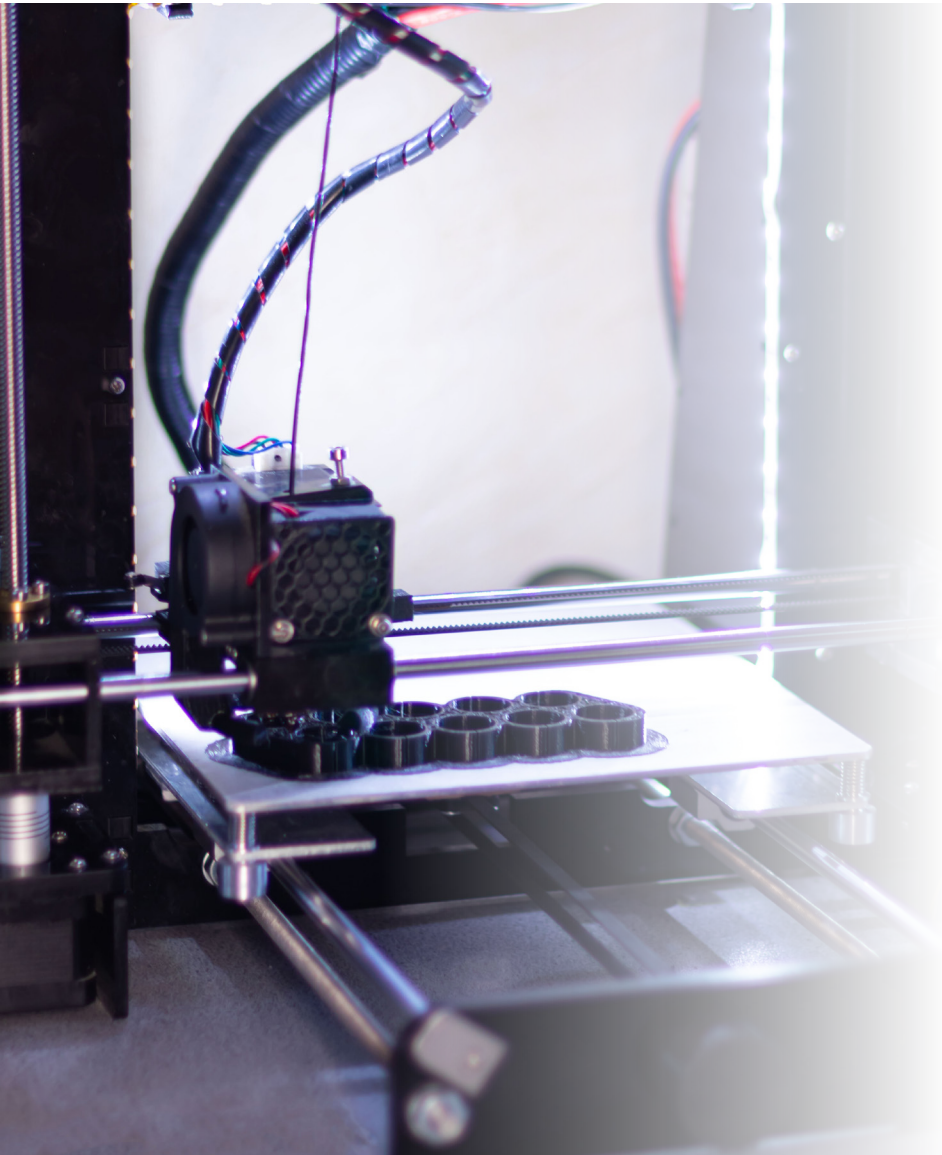
Due to the product diversity across the building materials sector, the production process can differ greatly from plant to plant. Each manufacturer's position in the building materials supply chain can vary as well based on where they receive and ship materials and products.

EXAMPLES OF BUILDING MATERIALS MANUFACTURING.

The building materials industry encompasses thousands of components and products — from sheets of drywall to steel studs to sliding glass doors. Here are some of the most common types of building materials manufacturers, many of which we serve at L2L:



- Wood and wood products
- Steel and other metals
- Composite materials
- Plastics
- Concrete
- Aggregates



EMERGING TRENDS IN BUILDING MATERIALS.

Materials like steel, stone, and lumber have been around for thousands of years and are certainly here to stay, but how we use them in construction is evolving.

The demand for sustainable materials has gone up considerably in the last decade, and more manufacturers are incorporating recycled materials into their production lines. Additionally, many government organizations are cracking down on carbon emissions in construction, encouraging manufacturers to not only produce materials with minimal impact on the environment but adopt more sustainable production processes.

Another emerging trend in building materials is the inclusion of additive manufacturing practices. The best example of additive manufacturing is the advent of 3D printing technology. Instead of using traditional manufacturing processes involving multiple machines, 3D printing allows engineers to design complex products with more accuracy and shorter lead times. In building materials manufacturing, 3D printing enables plants to create items as small as door handles and as large as wind turbine bases.

KEY CHALLENGES FACING THE BUILDING MATERIALS INDUSTRY

The building materials industry has its fair share of challenges. With so many material varieties on the market, certain manufacturers may thrive while others struggle on the rollercoaster of supply chain volatility and material price fluctuations, among other issues.

Here are the top challenges faced by building materials manufacturers today:

Supply chain disruptions. Many factors threaten supply chain stability. During Covid-19, for example, on-time transportation of materials was unreliable at best, while demand for these materials remained high due to an uptick in DIY home projects. Issues such as the availability of labor, rising shipping costs, and scarcity of certain materials continue to affect the building materials supply chain — and they're not going away anytime soon.

Labor shortages and retention. Like many manufacturers, building materials factories tend to struggle with finding and keeping workers of all skill levels. This is due in part to a competitive labor market. However, many workers find the

repetitive and often physically demanding roles offered within the industry to be unappealing, and understandably so.

Fluctuations in prices and demand. The cost of raw materials is always in flux. Because of this, maintaining healthy profit margins can be extra challenging for building materials manufacturers. Demand is another highly variable factor. For instance, now that housing prices are starting to fall and demand for new construction has gone up, many manufacturers are finding it difficult to produce enough to satisfy supplier needs.

Inventory management. Unsurprisingly, with fluctuating demand comes inventory management challenges. Changes in material availability and demand for materials produced require building materials plants to keep a close eye on inventory levels and forecast material availability with maximum precision.

Plant floor safety. Keeping workers safe on the job is another major challenge for building materials manufacturers. Since many of these manufacturers require manual sawing, cutting, welding, and other dangerous processes, the risk of injury due to exposure to sharp objects and extreme temperatures is incredibly high.

WHY EVERY BUILDING MATERIALS MANUFACTURER NEEDS A DIGITAL TRANSFORMATION STRATEGY

Unlike industries such as automotive and aerospace, the building materials industry has been slow to embrace digital transformation. However, digital technology can boost productivity, efficiency, safety, and even profitability.

But first, let's define digital transformation.

WHAT IS DIGITAL TRANSFORMATION?

Digital transformation refers to the ongoing enhancement of business processes and augmenting existing roles with digital technologies. The goal of digital transformation is to improve processes, increase efficiency, and help organizations deliver more value to customers while also optimizing work environments.

WHY IS DIGITAL TRANSFORMATION IMPORTANT FOR BUILDING MATERIALS MANUFACTURERS?

Applied to the manufacturing of building materials, digital transformation provides the following major benefits:

- **Digital transformation streamlines communication internally and with external partners.** Oftentimes, building materials factories have siloed internal communications systems, making it





difficult for people on the shop floor to share information in a timely manner. However, smart factory solutions can digitize and centralize SOPs, safety manuals, best practices, and more while enabling real-time communication through mobile devices. Plants can also communicate with logistics companies, suppliers, and distributors more easily as well.

- **Digitized operations improve the worker experience.** Connected worker technologies, such as digital standard work instructions and checklists, AI-powered wearable devices, and automated safety alerts create a safer and less frustrating work environment for everyone on the shop floor. Plus, automating repetitive tasks boosts efficiency and frees workers to focus on more complex tasks.
- **Manufacturers can better adapt to disruptions, fluctuations in demand and prices, and even equipment downtime with digitally transformed factories.** While you can't avoid the effects of market volatility and supply chain disruptions entirely, you can prepare your plant to weather these challenges by digitizing communications and operations.
- **Digital transformation also maximizes the value of existing systems, such as manufacturing execution systems (MES) and enterprise resource planning (ERP) systems.** For example, smart factory technologies like AI and ML not only feed data into these systems but also analyze that data and glean insights that you can use to drive continuous improvement across your plant.
- **Moreover, connected worker technology makes MES and ERP data more accessible, useful, and actionable for frontline workers.** These solutions not only share plant data but suggest next-best actions to help workers address production problems faster and with less outside intervention.

BENEFITS OF DIGITAL TRANSFORMATION FOR BUILDING MATERIALS PLANTS

From enhancing worker safety to accelerating production processes, digital transformation unlocks an incredible array of benefits for building materials plants. Here are some of the key outcomes you can expect from successful digital transformation:



Reduced waste across the value chain. No matter the product, scrap is a major concern for every building materials manufacturer. Smart manufacturing technologies help plants dramatically reduce scrap by helping them cut, weld, mold, mix, and more with greater precision. They also enable faster detection of abnormalities, allowing you to fix equipment before you waste large quantities of materials.



Boosted productivity and efficiency. With innovations like condition-based maintenance and connected worker solutions, building materials manufacturers can optimize people, processes, and machines for maximum productivity and efficiency. Automating repetitive processes and detecting equipment problems before they result in unplanned downtime helps plants maintain high-volume, high-precision production quotas with ease.



Increased worker safety. Digitized plants have lower instances of worker injuries. Technologies like IoT sensors and wearable safety devices alert workers of potential safety hazards due to equipment malfunctions and ergonomic problems, respectively. These devices also collect and analyze data from these events to help plant leadership create safer work environments.



Less turnover. Plants that use modern digital technologies in their everyday operations are far better aligned with the way younger generations of employees work. Manual tasks, such as tracking processes on clipboards and using fax machines to communicate with external partners, frustrate workers and hinder their productivity.



Better supply chain management. The building materials supply chain is layered with complexity and unpredictability. By digitizing your supply chain management system, you can better forecast material availability and align production schedules to meet shifting demand. Full visibility into every major factor that affects the on-time delivery of products and components allows building materials manufacturers to remain resilient in the face of supply chain disruptions.



Increased visibility into production. Every day, plants generate troves of data. But without a way to capture and make sense of the data, manufacturers lose countless opportunities to improve their operations. Digital transformation allows you not only to capture data from people and assets but uncover insights that help you drive continuous improvement across your plant. Plus, allowing employees to access job-critical data from anywhere in the plant dramatically increases their productivity.

WHY CONNECTED WORKERS ARE FOUNDATIONAL TO DIGITAL TRANSFORMATION

We've covered the major benefits of digital transformation for the building materials industry. Now, it's time to shed light on the heart of your plant's operations: your people.

No digitization journey achieves success unless it's designed to help your employees do their best work. That's where connected worker solutions come into play.

WHAT IS A CONNECTED WORKER?

A connected worker is any employee who is integrated into their environment with the help of digital technology. Connected workers are empowered by innovations like digital work instructions, AI, ML, and IoT applications to perform their jobs with greater efficiency.

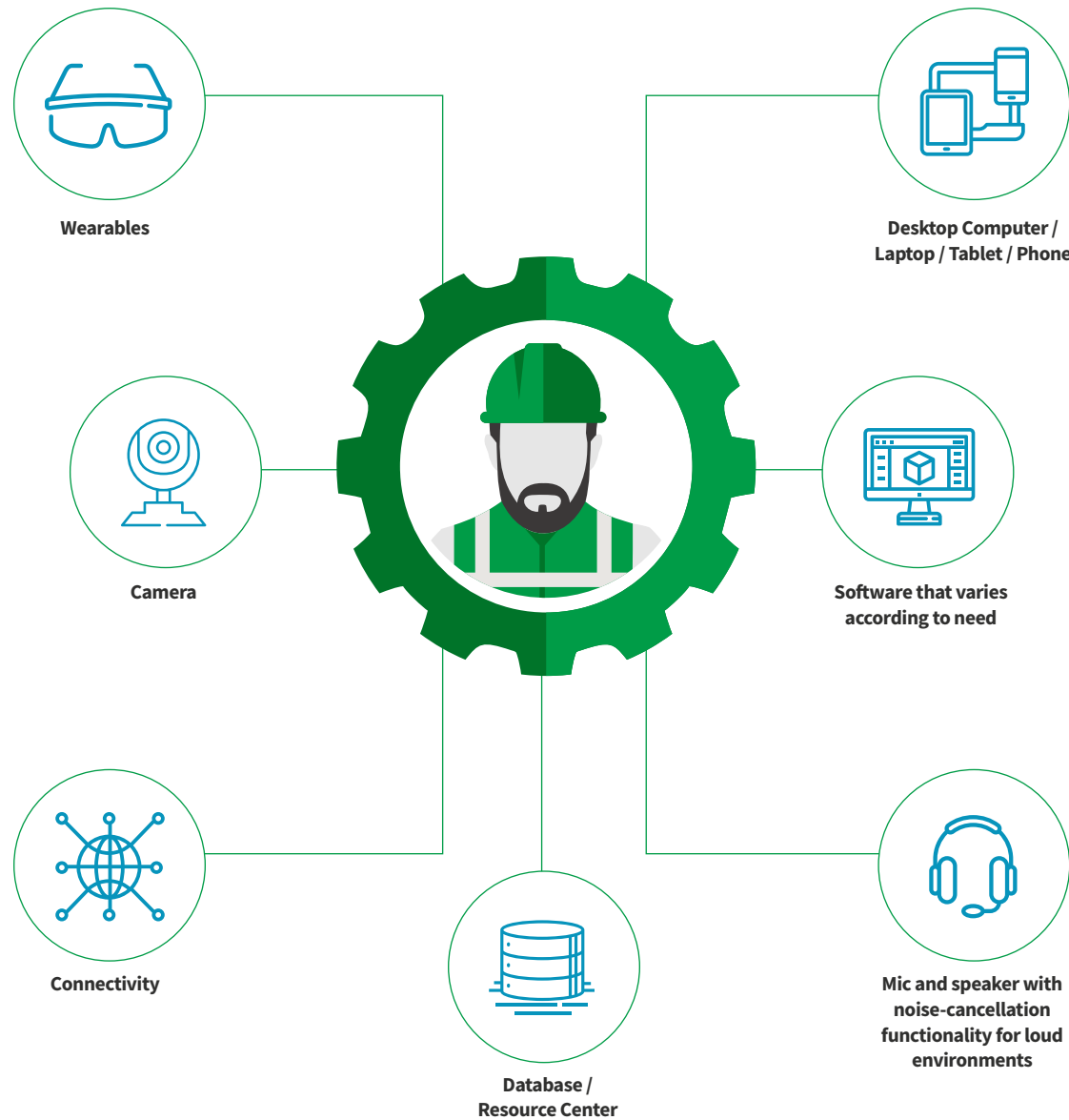
Here are a few examples of connected workers in action in a building materials plant:

- When a plant's Andon system alerts Maintenance to abnormal vibration, a technician can scan a QR code on the machine to pull up a single dashboard featuring that machine's maintenance history, current status, and recommended next-best actions to solve the issue.
- A new worker can learn how to operate a robotic welding arm in hours — not days — using artificial reality (AR) glasses with AI-generated instructions.
- Smart PPE, such as an IoT helmet, can automatically alert a worker operating a forklift of another worker's presence if they get dangerously close.



WHY CONNECTED WORKER TECHNOLOGY IS A MUST-HAVE INVESTMENT.

No matter how advanced your machines and software are, your plant's operations depend on your workers. Equipping them with the tools and information they need to do their jobs well will save you time and money in the long run — and even deliver immediate benefits as well. Let's take a deeper dive into the primary ways connected worker solutions can benefit your business.



BENEFITS OF CONNECTED WORKERS FOR BUILDING MATERIALS MANUFACTURERS

Connecting your workforce is the key to unlocking maximum productivity. Here are just some of the ways a connected worker solution can transform your plant.



Access to real-time information. Connected worker solutions can integrate with your existing systems, such as MES, ERP, and CMMS, to make data accessible and sharable to anyone in your plant who needs it. Instead of digging through old binders and tracking down specific people for specific pieces of information, your workers can find that data and documentation in a central location using their mobile devices.



Improved worker efficiency. The combined advantages of connected worker technology drastically improve worker efficiency. Not only can your workers access critical information faster, but they can also know what to do and where to be at all times thanks to features like automated workflows and scheduling. By eliminating guesswork and reducing manual tasks, you can help your workers achieve more in less time.



Less frustrating work. By removing barriers to getting tasks done quickly, connected worker technology promotes a less frustrating work environment — especially for younger employees. Utilizing technologies these workers already use, such as smartphones, IoT devices, and WiFi, empowers them to perform tasks faster and more independently. In turn, worker engagement rates will go up, and turnover rates will go down.



A safer work environment. Connected workers are safer workers. Technologies like digital safety crosses enable manufacturers to share real-time safety reports on digital screens in key locations across the shop floor. Wearable devices and real-time equipment monitoring improve situational awareness on the shop floor and alert workers of safety hazards. Through these and other features of connected worker technology, you can substantially reduce the risk of injury on the job and more easily comply with safety regulations.



Faster training and onboarding. Getting new workers up to speed on plant processes takes a significant chunk of your time and resources and limits plant productivity, especially if veteran employees need to step away from their work to facilitate training. Connected worker technology alleviates much of this burden by not only letting new workers access data when and where they need it but also by enabling immersive learning experiences using AI and AR.



Greater cost savings. When you equip your workforce with technology that makes them more efficient and productive, you reap the benefits across your plant. Connected worker solutions help building materials manufacturers reduce waste, increase throughput, reduce downtime, and maximize profits. In fact, L2L's customers have seen positive ROI within just a few months. Plus, connected worker solutions are generally easy to implement, requiring only several weeks to stand up.

CONCLUSION

Digital transformation is no longer optional for building materials manufacturers. The only constant with supply chains and global market conditions is their volatility, and digitizing your plant floor is crucial for staying agile and profitable in today's economy. Moreover, connected workforce solutions help you control many of the variables that lead to lost profits, including inefficiency, scrap, and turnover.

Ready to get started?

It's time to future-proof your shop floor. Reach out to sales@l2l.com to book a demo today, and see how our leading connected worker technology can transform your plant.





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