A man with a beard, wearing a light grey long-sleeved shirt and a yellow headset, is standing in a factory or industrial setting. He is holding a laptop and looking at the screen. The background shows industrial machinery and lights.

# How to develop your automation strategy

Our guide to creating  
a strategic automation  
plan that delivers a  
competitive advantage

**WIPFLI**

# Automation was once the future of manufacturing. Now that future is here.

While survey after survey shows that manufacturers recognize the value of automation, the industry overall has been slow to embrace it as part of a larger digital transformation strategy.

There are valid reasons for this — starting with the capital, research and planning required to rethink and retool operations. Yet manufacturers that don't invest in automation are missing out on significant value and growth opportunities. Moreover, as Industry 4.0 technologies become more prevalent and affordable, the window to establish a competitive advantage using automation is narrowing.

In other words, manufacturers that are slow to create and execute an automation strategy could soon fall behind the pack.



It's time to think more strategically about automation,  
and our e-book can help. We'll cover:

How automation  
can lead to **more  
committed**  
customers – and  
employees

Where to look  
for **automation**  
opportunities

What to do with  
**all the data** you've  
collected

How to  
**improve** your  
manufacturing  
automation  
strategy

Strategies to get  
the **best return** on  
your Industry 4.0  
investments



# How automation can lead to more committed customers — and employees



## How automation can lead to more committed customers — and employees

The value of automation in manufacturing isn't about using new tools to do the same thing as people, faster. Real value is gained by using automation's inherent efficiencies to be more innovative, to develop new business models and to create a better experience for customers and employees.

Manufacturers that focus on generating more value will find they can earn greater commitment from their customers while boosting employee satisfaction.

## Decreasing variance to create more trust

As a whole, our culture is becoming more impatient. We have been conditioned to want information, products and results on a schedule that suits our needs, which is usually right now. **Manufacturing customers want faster answers, service and turnaround because their own consumers are demanding the same.**

Customers also want greater certainty. Their reputation rests at least in part on the on-time delivery of high-quality parts or products.

Automation is one way that manufacturers can deliver an experience that meets their customers' expectations:

- Automated production and material transfer can reduce cycle time, increase throughput and enable manufacturers to support higher production volumes.
- Industrial robots can unlock greater efficiency and productivity in areas as diverse as material handling, production and warehousing.

- Industrial internet of things (IIoT) capabilities, such as condition sensors, can be used to predict and prevent equipment failures and other situations that derail production schedules.
- Real-time machine monitoring capabilities can allow you to react quickly to current production conditions before it becomes a problem.

The shop floor isn't the only place that automation can be deployed to create a better experience:

- **ERP:** An enterprise resource planning system that incorporates Industry 4.0 capabilities can more effectively merge production planning and manufacturing activities. Through system integration, manufacturers can use connected systems to make faster and more informed decisions.
- **RPA:** Robotic process automation can be implemented in a variety of functions to decrease, if not eliminate, errors in customer-facing processes, such as payable invoices.

- **EDI:** Adopting electronic data interchange also helps you connect systems reduce administrative work and human error and save time.

Reducing variance across the enterprise will build trust in your operations, your quality standards and your product performance. All of this adds up to happier customers who will stick with you in return for a higher level of service.

## The benefits of automation



1.4% annual raise in productivity that automation can generate



42% of time spent on manufacturing tasks could be automated by 2022



70% of workers believe automation will enable them to move into high-skilled jobs



\$15.7 trillion could be contributed by automation to the global economy by 2030

Source: *McKinsey Institute, World Economic Forum and PwC*

## Creating more opportunities for career development

While automation can create greater efficiencies, more capacity and more opportunities for growth, it can understandably provoke anxiety in employees. It's true that automation can create redundancies in labor. But this doesn't necessarily need to be cause for downsizing. In fact, [investments in automation can improve employee satisfaction and morale.](#)

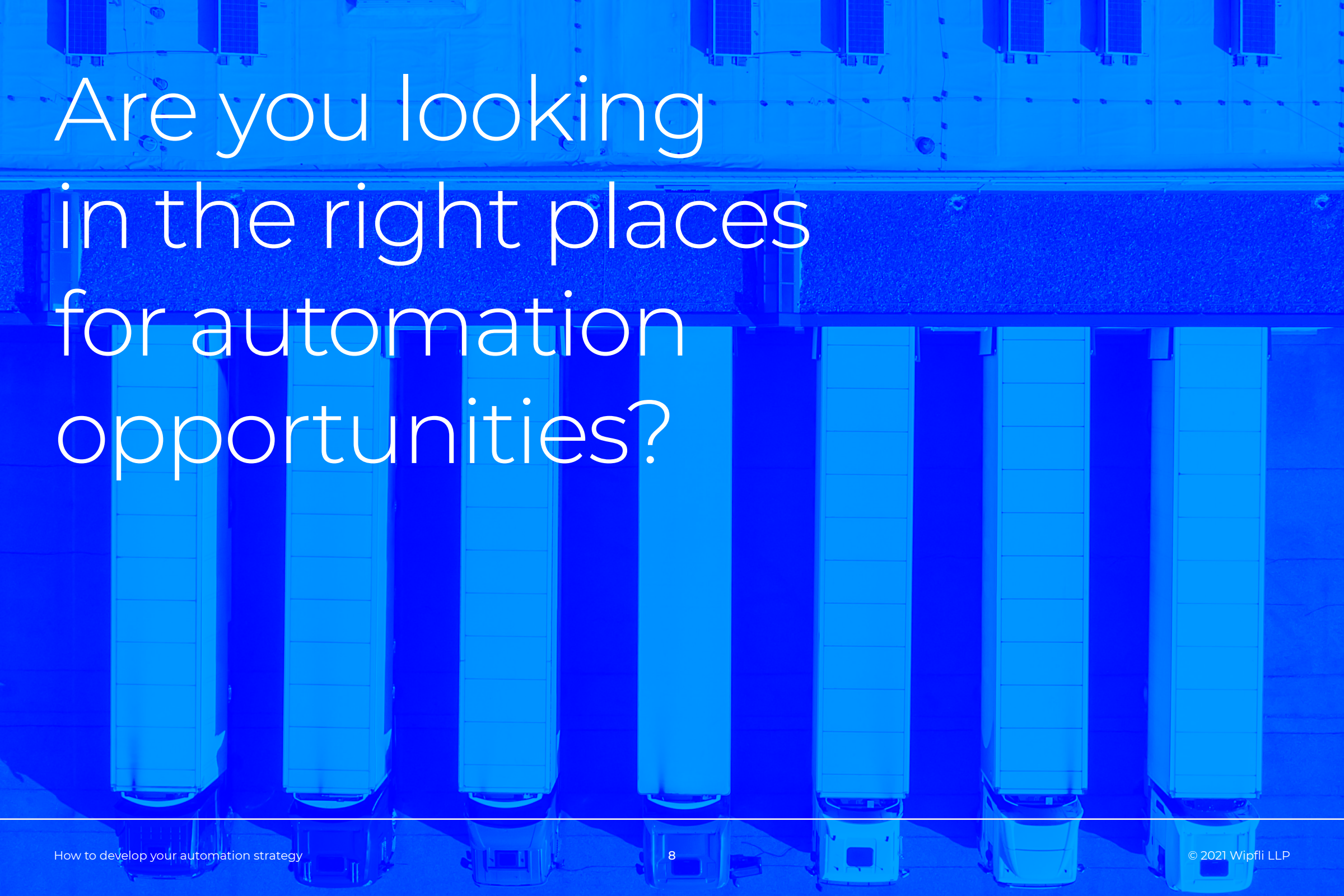
Critical thinking and creative problem-solving skills are very much in demand in an automated shop, but they aren't often required for tedious and non-value-added tasks. Automating repetitive or time-consuming jobs can free staff up to focus on more challenging projects that require a

greater range of skills. Automation on the production floor can improve safety by using robots or digitally enabled workflows to handle tasks that are dangerous or prone to causing injuries.

Manufacturers that want to pursue this angle need to keep in mind that creating the right workforce for the 21st century workplace doesn't happen on its own. If there are meaningful opportunities to redeploy staff to higher-value functions, leaders need to strategize if, when and how to upskill, reskill, multiskill and otherwise shift their employees into new functional areas. Success will also hinge on developing a change management strategy that will bridge legacy culture and behaviors with the new technology mindset.







Are you looking  
in the right places  
for automation  
opportunities?

# Are you looking in the right places for automation opportunities?

The words “automation” and “manufacturing” tend to conjure images of industrial robots assembling vehicles with rapid precision or cobots working side-by-side with their human counterparts.

Robots may be the most instantly recognized hallmark of smart factories and Industry 4.0. But they are only one component of a broad array of automation technologies that are available to manufacturers. And they aren't always the right place to start when making the transition to an automated shop.

In fact, some of the best, most straightforward opportunities to remove effort, improve accuracy and reduce risk are fairly mundane. Automating information flows or manual production processes may lack the wow factor of a robot, but you could leapfrog ahead of your competition in terms of efficiencies gained.



Here's how to make sure you're looking in the right places for automation opportunities that will deliver the results you want.

### First define the “what”

The field of automation is evolving so fast that it's easy to get enamored with the latest robotic apparatus or IIoT capabilities. However, before you implement the next-generation mobile manipulator or transport drone, you need to first identify what you want or need to accomplish. There are a host of reasons to automate, including:

- **Increasing throughput:** Digital workflows and automation technologies simply get the job done faster. Moreover, robots, artificial intelligence (AI) and other Industry 4.0 capabilities don't require breaks, enabling manufacturers to expand the workday – and their capacity – without significantly adding to their payroll.
- **Improving accuracy:** Every manual touchpoint introduces the potential for error. Automation provides for greater precision and consistency by removing that potential from the equation.
- **Reducing risk of injuries:** Even with airtight safety measures in place, shop floors can be dangerous. As we mentioned earlier, robots and cobots can handle tasks that are ripe for injury, whether from repetitive actions, difficult maneuvers or heavy or dangerous equipment or materials.
- **Gaining competitive insights:** Manufacturers that don't know what they don't know about their equipment, processes and even their customers are leaving value on the table. Sensors, AI and analytics software can unlock prized insights that can be used to build a significant competitive advantage.
- **Mitigating labor shortages:** Skilled and unskilled talent is still in high demand – and difficult to come by. Automation can enable manufacturers to do more with fewer resources. It can also double as a tool for recruitment by attracting digital natives and “techies” who enjoy working with industrial technologies.



## Then identify the “how”

After defining what you want to achieve, you can build the case for how and where to invest in automation. In doing this work, you may be surprised to find that the opportunities with the best and fastest return for investment are relatively low profile or not on the shop floor at all.

Some of the best places to start include:

- **Repetitive and labor-intensive tasks:**

The most valuable asset that people bring to the job is their brain. Far from replacing people, automation can enable employees to trade out repetitive or boring tasks for more challenging, problem-solving roles. Ultimately, this is a better use of their talent and your capital.

Or consider tasks that no one wants, like counting inventory. Instead of assigning a person to hand count materials, you can deploy drones and sensors to collect this information, which can then be tracked in your ERP system.

- **Positions that are difficult to fill:**

While manufacturers are challenged by a tight labor pool overall, some positions, such as welders, are more difficult to fill than others. Rather

than risk missed production goals because of a skilled talent shortfall, automate these positions and focus your recruitment efforts in other, higher-value areas.

- **Business functions with high overhead:**

Back-office functions, including human resources and accounts receivable, are foundational to the business, but they also consume overhead. Investing in RPA solutions to automate manual processes will enable employees to accomplish more in a day with fewer errors and at less cost.

- **Paper-based processes:** Operations that rely on paper-based processes to run the production floor lose a staggering amount of time to manual entry, lost files, missing information and general errors. Upgrading your ERP or investing in ERP apps to digitize information flow will enable

your team to reclaim days, if not weeks, of production time while reducing variances and unplanned downtime.

- **Processes that rely on tribal knowledge:** It's not unusual for manufacturers to lean on tribal knowledge in place of defined processes or hard data. Yet, in addition to the inherent risks this poses to business continuity, it can also become a roadblock to productivity and profitability.

Combining business intelligence tools and IIoT capabilities to capture, aggregate and analyze disparate data will lead to faster, more informed decisions. For example, you could generate more accurate quotes that won't leave your jobs under water or develop production schedules that make the best use of capacity and people.

## Always think strategically

Automation can generate tremendous advantages, but there is a caveat. To optimize your investment, you need to create an enterprise-level plan. Automating a cell or a line or a business process alone may deliver some benefits, but they will be limited at best. At worst, piecemeal efforts could hamper operations and create bottlenecks.

To avoid this, you need to first perfect your manual processes. Automating wasteful steps or non-value-added tasks won't deliver on your goals. It will only waste time at a faster pace. After you have streamlined workflows, you can look across the organization to identify where to best improve on your processes with technology. Opportunities to automate across functions, such as by deploying a robot

that can move across multiple cells, will deliver greater efficiencies.

Remember to start small, test, modify and adapt before scaling your solutions. Getting it right before going big will save on capital, minimize disruption and build credibility among your staff. And get your employees involved in the process. Show them that you are not replacing them but rather creating opportunities to use their skills more effectively in support of shared growth.



An aerial photograph of a multi-level highway interchange, overlaid with a blue grid pattern. The text "You've got data. Now what?" is written in white in the upper left corner.

You've got data.  
Now what?

# You've got data. Now what?

IIoT capabilities, automated workflows, enterprise-level platforms and other components of Industry 4.0 have opened the floodgates on data. From sensors on machines to ERP systems, manufacturers have a wealth of information at their fingertips.

As a result, the conversation is rapidly shifting from how do I get data to what do I do with it?

This is a question that manufacturers need to resolve sooner rather than later.

**As the industry increasingly leans into digital transformation, the ability for use data will no longer be a competitive advantage. It will be table stakes to staying in the game.**

Relying on people to manually pull information and update Excel spreadsheets won't cut it. To maintain an edge, manufacturers will need to get smarter about how they retrieve, sift through, measure, analyze and use their data. This will be the key to making fast decisions based on relevant, real-time data culled from multiple sources instantaneously. And it requires automated processes for getting data into shape and for moving it between systems.

To help guide this journey, we have compiled a list of frequently asked questions for getting the most value from your data analytics and manufacturing operations.

## How do you know if it's the right data?

From the shop floor to the back office, there is no shortage of data. But not all of that data is the right data.

To get the data you need, start with a specific question or area of the business that you want to better understand. Then construct a data strategy document. The document should identify what data you need, how it will be collected, and from where, by whom and when. This exercise will narrow down your data sources and ensure you don't overlook data that you need but are not collecting. Your end users are vital to this process and can provide valuable insights into the data you have at hand as well as gaps in visibility.





### How do you know if it's good data?

It's not unusual for manufacturers to discover sizable gaps in data uniformity when they start this journey. More often than not, these gaps are the legacy of information silos, disparate platforms, a lack of defined processes or training, and even staff turnover. The result? Incomplete, inconsistent, incorrect and duplicated records.

Perfect data is an anomaly, but manual data cleansing is time consuming. It's also a costly and never-ending task. As timeliness, speed and accuracy become key components to customer satisfaction, and as the labor market continues to tighten, it simply isn't economical to devote hours and days to cleanup efforts over the long term. The good news is that data profiling and governance tools are available to

automatically identify data gaps or inaccuracies to ensure that the data you pull is good.

### How do you protect data integrity?

To ensure that data cleansing is a one-time exercise and not a weekly activity, create a governance structure for how information is recorded, accessed and used.

At the most fundamental level, the structure should specify how data is formatted and entered. Make data entry as foolproof as possible by providing defined choices, rather than free-form boxes, wherever possible. And dedicate time to training staff about how the data will be used, why it is valuable and what their role is in protecting data integrity. The more you can automate how data is entered, cleansed and shared between systems, the better you can safeguard data integrity.

### How do you make data actionable?

To make data actionable, it needs to be complete, clean and timely. You want to give users access to real-time information and intuitive self-service tools to help them analyze data. This can be achieved only with an automated pipeline that can pull, transform, cleanse and normalize the data.

Many manufacturers discover that, while they have systems in place to manage or even analyze data, the systems are not connected. This requires employees to manually enter, extract, manipulate or distribute data between disparate platforms, putting the brakes on information flow and work streams.

If this situation sounds familiar, rest assured that it doesn't necessarily mean all your systems need to be scrapped. Often, data pipelines can be rebuilt to provide the automation you need to make quick, informed decisions; take prompt corrective measures; and accurately forecast for the future.

### How can you make sure you're positioned to scale for the future?

The data available to your organization is only going to grow exponentially. Creating a roadmap will ensure your people, processes and technology are aligned to easily scale up as new innovations come to market and your use cases expand. The roadmap should cover:

- The data requirements of your end users.
- How you intend to use data in the near term.
- Where you want to expand your data analytics capabilities in the future.
- A governance structure to keep data structured and usable.
- Infrastructure investments for moving and storing data.



A sound, well-built roadmap is essential to identifying and avoiding unanticipated hurdles as your operations grow or change. It is also critical to gaining staff buy-in. As you begin your data journey, invite employees to share their perspective on how data can best be collected and used. Building a business case with input from your employees will be foundational to creating and sustaining a data-driven culture.



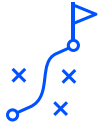
# Eight steps to improve your manufacturing automation strategy

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Automation and other aspects of Industry 4.0 will soon be essential to maintain profitability. As more shops overhaul traditional business models in pursuit of digital transformation, smart manufacturers will have the upper hand.

If you're not sure where to begin or how to get the most from your manufacturing automation technologies, you're not alone. Getting started can be overwhelming, especially for small and mid-sized businesses. We compiled the following checklist of automation best practices to help you start your journey on the right foot.





## 1. Build a strategic roadmap

Embracing automation is not an overnight or a one-and-done activity. It's a journey that will likely touch every aspect of your operations. Before getting started, you need to define where you want to go — that is, what you want to measure or improve. You will use this goal to guide process improvements and capital investments. From there, you can break the journey down into smaller and more manageable pilot projects.



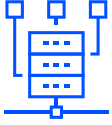
## 2. Align your budget and your plan

Manufacturers typically overestimate the cost of automation. The truth is, most automation technologies are not as expensive as most people think, provided the investments are made strategically. Prioritizing your spend based on business requirements is the key to ensuring the right investments are made in the right places at the right time. This will also keep your team from getting sidetracked by the latest innovations or when technology trade-offs are required.



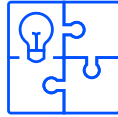
## 3. Establish an automation champion

To maximize your return, you need an automation champion who can oversee your strategy on a full-time basis. This project owner should be supported by a diverse, cross-functional team to ensure that use cases and solutions are fully vetted for purpose, feasibility, applicability and pitfalls or roadblocks. This team can also double as ambassadors to help build internal buy-in for your automation journey.



#### 4. Reinforce your infrastructure

Efforts to triangulate people, processes and intelligence will come up short if your shop lacks the proper infrastructure. Your IT backbone needs to support uninterrupted connectivity, unimpeded information flow and adequate storage. As you connect more systems and people, you may also need to bump up your cybersecurity defenses and business continuity tools.



#### 5. Identify pilot projects

There's no reason to go big right out of the gate. Start small with relatively simple processes that can be easily automated. Look for tasks that are repetitive, create bottlenecks, are difficult to fill, have high overhead, rely on paper or are prone to error. Proving the concept before scaling up will save you money, avoid unnecessary disruption and help win over detractors.



#### 6. Analyze and perfect your processes

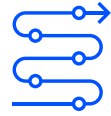
Before you can automate a process, you need to understand that process by walking through it from end to end. Then you need to perfect and document it. Skipping this step will simply replicate inefficient processes and data gaps. Only after removing non-value-added tasks should you look for opportunities to automate. You can prevent wasteful activities from creeping back in by establishing a governance structure.



## 7. Optimize your existing equipment and technology

It's not unusual for manufacturers to defer upgrading their automated capabilities because of limited resources. But in many cases, there's no need to start from scratch. Legacy equipment? Modernize your equipment with sensors and other capabilities. Outdated or overextended ERP software? Consider layering on applications to expand what your ERP can do for you. Information silos? Build or rebuild data pipelines to seamlessly link standalone applications, technology platforms and analytics tools.

That's not to say that these and other systems won't need to be replaced at some point, but it does allow you to stretch your resources.



## 8. Involve your employees in the journey

Your employees are your number one source of knowledge about current processes and opportunities for improvement. They understand your business and your customers, making retention a priority. Involving them in the planning process will be key to a successful implementation. At the same time, you need to be thinking about how to best upskill or multiskill your staff to ensure your workforce is equipped with the appropriate skills for Industry 4.0.





# Four strategies to get the best return on your Industry 4.0 investments

# Four strategies to get the best return on your Industry 4.0 investments

Many manufacturers have been reluctant to adapt Industry 4.0 out of concern that the technologies are too expensive or complicated (or both). In actuality, economies of scale are putting these tools within reach of even small and midsized shops. Implementation costs will continue to trend down as the technologies become more widespread.

However, there is a cost to not getting it right the first time. **Returns will diminish quickly if the technology is viewed as a quick fix rather than part of a long-term digital strategy.** Low-cost, low-complexity products may fit the bill today, but they may not be the most advantageous investment for long-term growth. Here's our view on

where manufacturers can make smart initial investments to get a better return on their smart manufacturing technologies.

## 1. Get connected with sensors

A component of IIoT capabilities, sensor technologies are transforming the industry by opening the throttle on operational and performance data. Sensors are more accessible and practical than ever for small and medium-sized shops — even those operating with legacy equipment — thus enabling more manufacturers to secure a competitive advantage.

Manufacturers can use sensors to learn about the performance of their operations. Applications include insights into current equipment status (such as in-cycle, idle or offline), job progression and per-piece run rates. This data can then be gathered and used for historical comparison across machines, parts, shifts and employees.

As you build a foundation of objective performance data, you can use sensors to track and identify the causes of equipment failure and other unplanned downtime. By weeding out the issues that decelerate your workflows, you can regain minutes, hours and even days of productivity that can be converted into more capacity.

## 2. Get smart with data analytics

Sensors, ERP systems and other tools are generating more data today than ever before. With all of that data comes the need to gather, manage and use it. [Business intelligence tools](#) and dashboards can help manufacturers channel multiple streams of data into a single source of truth. With real-time information at hand, manufacturers can more quickly and confidently assess performance, analyze trends and make faster, more informed and more intelligent decisions.

To get the most from these tools, manufacturers should first build out specific use cases for what information they need to manage their business. From there, they need to ensure the data is integrated, actionable and always accessible to the appropriate users. Platforms and apps will need to

be integrated to unify data flow. And as the data proliferates, manufacturers will need to invest in automated solutions to pull data, transform it, normalize it, cleanse it and make it available to end users.

Once the infrastructure is aligned and unified, you'll get more benefit from your data and your dashboards.

## 3. Get efficient through automation

There are many reasons to automate and many areas throughout the business in which to automate. While production lines naturally lend themselves to automation, ERPs and other software tools can add tremendous value by removing time-consuming and low-value tasks such as data collection and report generation.

To get the best return, look for areas where you can remove effort, take

out risk, improve machine in-cycle time or reduce variances. Start small by testing out pilot projects before going all-in on a full implementation. Every opportunity to remove simple, straightforward manual processes – and to deploy those employees to higher-value functions – is an opportunity to expand capacity, improve productivity and increase revenues.

## 4. Get optimized with predictive analytics and machine learning

With predictive analytics and machine learning, you can identify patterns and reveal insights about your customers, supply chain, operations, people, products and production that would otherwise remain hidden. For example, you can use predictive analytics to find connections between sensors and production that can be used to

optimize performance. When you are able to key in on what sensor values equate to better production output, you can reduce variance and increase productivity.

When they are applied as part of a larger strategic plan, intelligence packages can pay for themselves in months, not years, by revealing opportunities to run your shop smarter, faster and better. The key, as with all Industry 4.0 technologies, is to make investments with an eye to the bigger picture. To get the most out of a predictive analytics package, you need to first pinpoint a problem you want to solve and have a robust IT backbone and automation capabilities to back you up.



# Think bigger — enterprise-level big

One of the biggest challenges to automation in manufacturing is the need to think and act at an enterprise level. You will need to evaluate new applications and platforms based not just on cell or function productivity, but on the value that it can bring to the overall business.

How will the technology be applicable in the context of your business today, tomorrow and three years from now? How can the capacity or time that is freed up by automation be better used? Where are the opportunities to upskill or multiskill staff so they can add more value? And most important, how will the technology create more value for customers so they will keep coming back?

These are big questions, and the magnitude of the effort can quickly become overwhelming. That's where Wipfli's team of manufacturing and technology professionals come in. We help manufacturers of all sizes strategize, plan for, prioritize and implement automation and other Industry 4.0 capabilities.



**[Click here to learn](#)** about how the Wipfli team can help you get started on or rev up your technology transformation.