

A wide-angle, black and white photograph of a large industrial factory floor. The space is filled with various pieces of machinery, including conveyor belts, workstations, and large metal frames. The ceiling is high with a complex network of pipes and lighting fixtures. The floor is polished and reflects the overhead lights. In the foreground, there are several large metal structures, possibly part of a production line. The overall atmosphere is one of a busy, modern manufacturing environment.

Solving the Skills Gap on the Factory Floor

A practical guide to approaching the manufacturing skills gap



Executive Summary

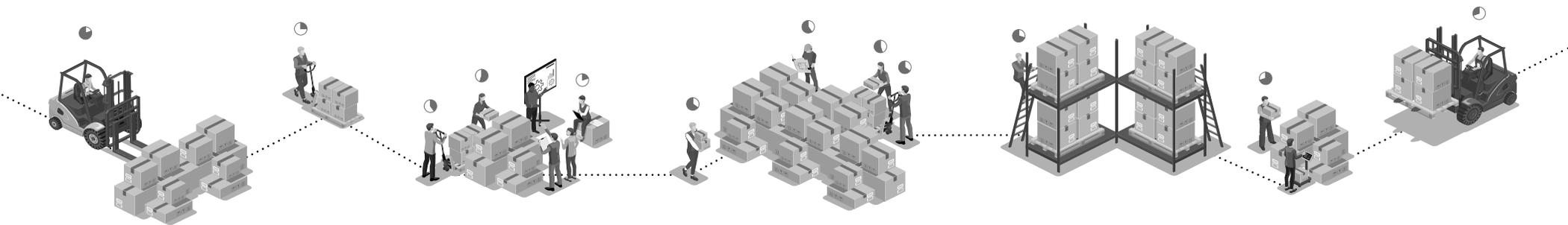
It's time to take a fresh look at the skills gap. Manufacturing Institute estimated that 2.4 million job openings in manufacturing—accounting for half of all open positions—will go unfilled between 2018 and 2028 as a direct consequence of the skills gap.

This isn't a future problem. The challenges of the skills gap are impacting businesses right now.

While recruitment and industry perception is one component, businesses need to adapt their current training strategy to prevent knowledge loss and adapt to the incoming workforce.

In this guide, we cover how traditional training practices are failing to address the challenges of the skills gap and outline tangible strategies that embrace digital tools to make industrial companies thrive in the face of this crisis.

The average U.S. manufacturer is losing an estimated 11% of its annual earnings (EBITDA), or \$3,000 per existing employee, due to the talent shortage.



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How the Skills Gap is Impacting Industrial Businesses

Manufacturers are seeing their workforce retire at an alarming rate. Without enough younger workers to backfill positions, millions of jobs are expected to go unfilled in the years to come.

For those in the manufacturing and industrial sector, what's commonly known as the skills gap is a well-documented issue.

As a growing number of Americans retire, they take their decades of experience with them, resulting in a noticeable skills shortage. The problem is poised to hit businesses hardest in the next few years, with over a quarter of the domestic manufacturing workforce being over the age of 55.

This trend is showing no signs of slowing down.

As each individual retires, they take their tribal knowledge with them, making it even harder to maintain production levels as new employees are trained up. When paired with an industry struggling to even attract job applicants from younger generations, it becomes an unavoidable issue.

***“The retirement onslaught as we predicted is actually happening.
You don’t have to be a genius. Just look at the age profile.”***

-Patrick Flaherty, U.S. State Department of Labor

Outdated Public Perception

The idea that domestic manufacturing is a shrinking industry is flat out false. The U.S. had as many people working in the manufacturing sector in December 2018 as it did 69 years ago in 1950, experiencing its best jobs growth in the last 30 years.

So why aren't young people interested in these open positions? We can boil it down to a matter of public perception. This should not come as a surprise.

Stigma about the manufacturing workplace as a dirty, dark, and dangerous profession is well understood. News reports often focus on waves of manufacturing layoffs and increasing automation. Taken together, it's no wonder young people aren't attracted to jobs that appear to be both grimy and unstable.

But domestic manufacturing is having a major comeback. The industry looks a lot different these days, modern facilities are typically clean and safe, full of advanced technologies, not greasy assembly lines—but that perception has yet to translate to career interest for young people.

It's time the industry adapts to remain competitive. To attract a younger workforce, companies can re-evaluate their job postings, open up their doors to show what a modern factory looks like, emphasize the advanced technologies in use, and much more.

This guide outlines simple strategies to help industrial companies tackle the challenge for sustainable success.

In a recent study, millennials (born 1981–1996) rank manufacturing as their least preferred career destination.



Training: A Key Component of the Skills Gap

How traditional training methods are preventing companies from upskilling employees quickly.

Due to a shifting workforce and outdated training methods, many manufacturers are failing to capitalize on their workforce capacity within current talent pools.

What can businesses do to bridge the skills gap and attract a skilled workforce?

The short answer — create better training programs.

Traditional training methods are no longer capable of upskilling employees effectively and are having a negative impact on quality, productivity, and employee retention. Take a hard look at your training program to adapt to a workforce in transition.

The Cost of Poor Training

More often than not, companies have formalized training programs, but in practice, skills are learned through a variety of informal ways. Ultimately, people rely on unofficial training

methods like job shadowing, which have been common practice in many businesses for decades.

These traditional training methods are inherently non-standardized and an inefficient way to transfer knowledge. Not only are they wasteful, but they increase safety risks and negatively impact quality.

In fact, 85% of quality costs are still caused by worker errors. This indicates that training programs still aren't where they should be. While these traditional approaches have been sufficient for their time, they ultimately lack standardization and could be improved upon.

One-on-One Training

Practices like job-shadowing and on-the-job (OTJ) training lack both scalability and visibility. These peer-to-peer coaching methods are only possible with enough experienced workers

“Every large company has some type of training program... Yet, go where the actual work is being done and ask people how they learned their jobs and you get a different picture”

-Jeffrey Liker and David Meier, Authors of Toyota Talent

available to train others. As more experienced manufacturers reach retirement age, fewer mentors are available for this training method to be practical.

Even if mentors are readily available, these methods still lack standardization, and the quality of training can be highly variable. Without a standardized system to manage training and knowledge transfer, best practices are left up to the experience, training technique, and frankly, mood of each employee.

Instructor-Led Classroom Training

Training in a classroom has the benefit of scalability, but significant downtime or productivity loss is often required. This makes classroom-based training inefficient from a production standpoint, and difficult to coordinate around multiple shifts.

Classroom methods can be necessary for certain types of training, however, comprehension and retention is at an all-time low in this type of learning environment. People learn best when they have strong visuals and can apply their knowledge in the proper context.

Manufacturing Training Has to Change

The workforce is different now. Employees only stay with a company for 2-3 years, not 20-30. The average American worker stays at their job for 4.6 years; for millennials, that number is just 3.2 years.

Where previous generations had entire careers to develop skills, the current workforce has just 10% of that.

3.2 years to hire and train someone. 3.2 years to cultivate their skills as a valuable contributor to your organization. 3.2 years for those same people to provide process insights and improvements. And 3.2 years to capture that before they walk out the door.

With these shorter periods of employment, manufacturers can no longer rely on traditional training methods to get new hires upskilled quickly. Instead, efficient and standardized approaches need to be used to train quickly and retain talent.

Over 55% of manufacturers believe that better training methods are the best way to decrease quality costs .



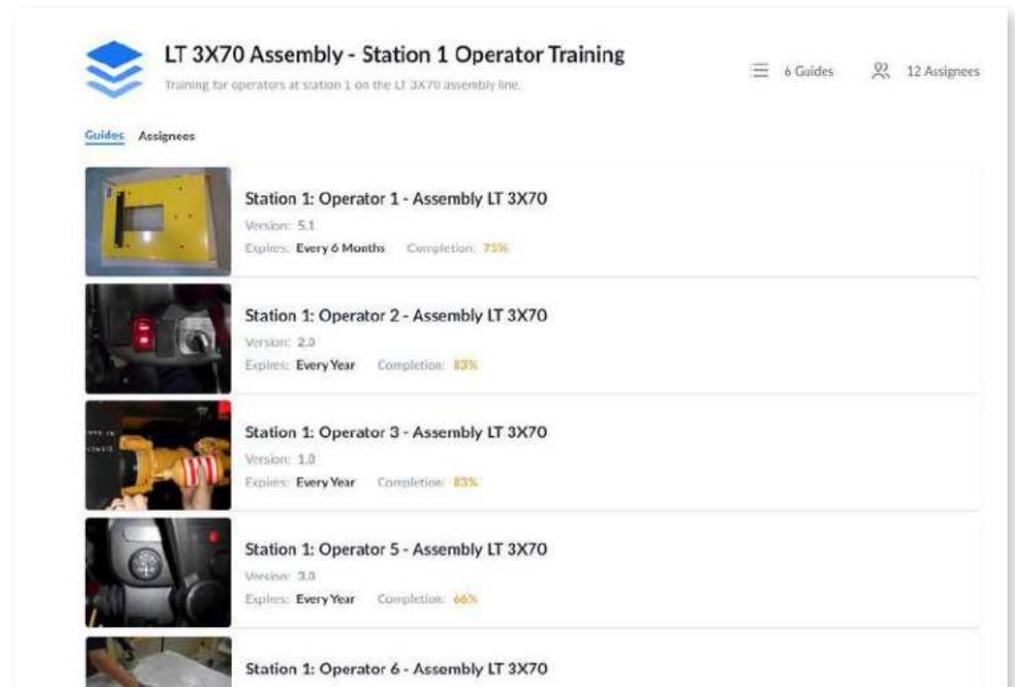
Strategies for Upskilling Quickly with Better Training

Practical advice for improving training programs to tackle the skills gap. New technology can help supplement and formalize training for the current and incoming generations of workers.

Standardize Training Curriculum

For those still reliant on informal training practices, standardization is a critical first step.

Doing so gives you confidence in the quality and safety of your operations. Standardized training enables work to be done consistently—regardless of the person, the shift, or the location.



Dozuki Courses enables companies to turn documented procedures into a training program, ensuring your workforce is trained to the latest standard—all the time.

Supplement with Visuals

Improve your on-the-job training by supplementing personal instruction with visuals to reinforce learning.

Having standardized, visual instructions that support training gives employees a better baseline for success and keeps quality mistakes to a minimum.

If the trainee misses something or forgets a particular technique, the documentation can also serve as a reference down the line.

Step 2 Set the Machine



- ☑ Steps 3-8 show how to set the machine and how to roll pieces for production.
- Turn the crank clockwise or counter clockwise to adjust the machine.
- Follow steps 3-8.
- Continue making adjustments and running new flat pieces through until your piece matches the appropriate template.

Step 3 Set the Plate



- Line up the plate and guides according to the print.

The Dozuki standardized guide format puts visuals first and supports multi-media formats to help train and communicate more effectively.

Empower Employee Development

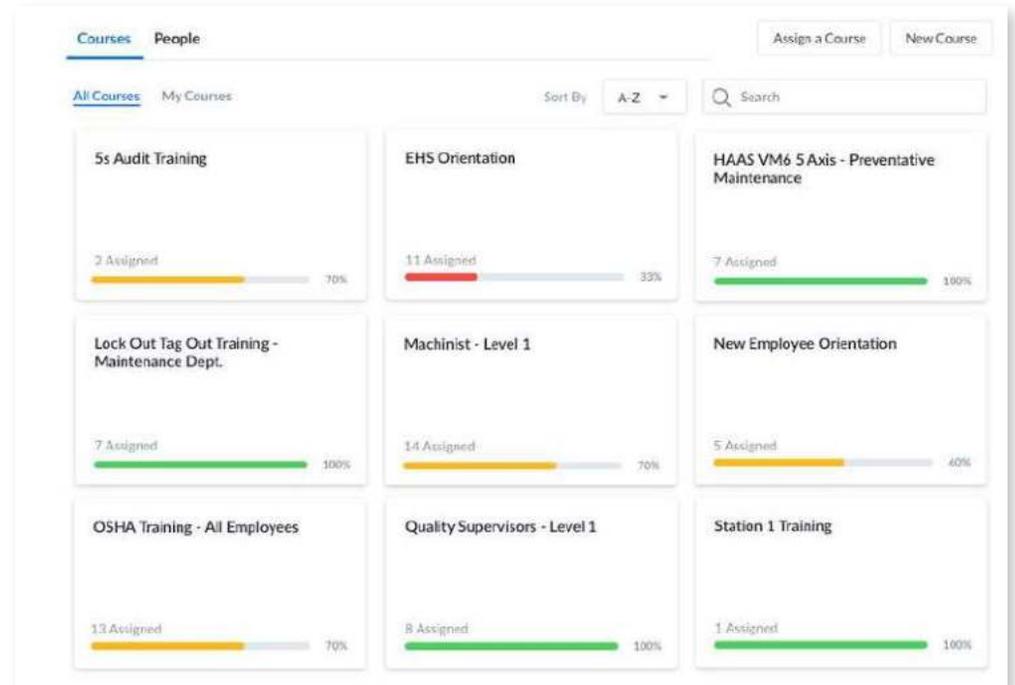
Allow your workforce to take skills development into their own hands and foster a culture of continuous improvement. This provides them an opportunity to find areas for growth and in return provide more value and flexibility to your operations.

The screenshot displays a user's training dashboard. At the top, it shows 'My Overall Course Competency 59%' with a green progress bar. Below this is a section titled 'Courses Needing Attention' with a red notification icon. It lists three courses: 'Machinist - Level 2' (0% Complete, 3 Guides, expired 439 days ago), 'Machinist - Level 1' (66% Complete, 3 Guides, a stage has expired), and 'Quality Training' (75% Complete, 4 Guides, expired 433 days ago). Each course has a 'Resume' button. Below this is a section titled 'My Course Competency' with a blue notification icon. It lists three completed courses: 'Quality Training' (Done, 4 Guides), 'LT 3X70 Assembly - Station 1 Operator Training' (Done, 4 Guides), and 'HAAS VM6 5 Axis - Preventative Maintenance' (Done, 4 Guides). Each completed course has a 'Review' button.

With Dozuki, employees have visibility into their training requirements. At a glance, they can see training that has been completed or still needs work.

Create Virtual Classrooms

Instead of resource-intensive classroom lectures, digital training tools allow you to take learning into virtual environments. This allows you to train large groups more efficiently and improves retention by dividing training into more manageable segments.

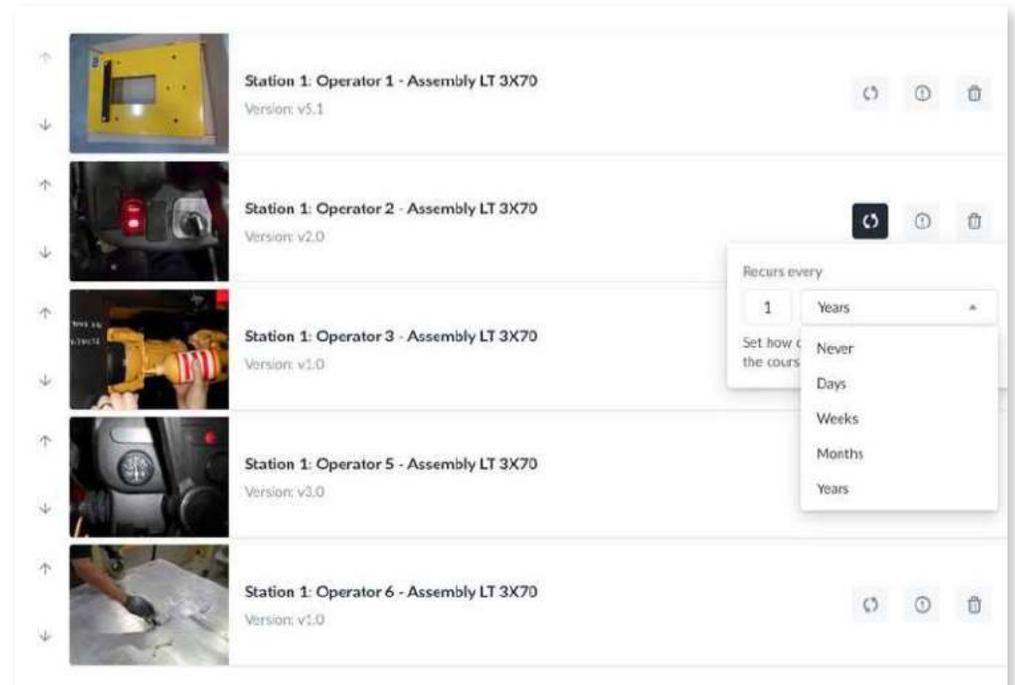


Dozuki Courses acts like a virtual classroom, enabling for fast assignment and tracking of training programs.

Automate Training Assignment

Set up tasks and create curriculum just once.

When an employee enters into a new team, training is initiated, and employees can work through their courses in their own time. Create training programs for facilities, lines, shifts, or machines, and build an efficient and scalable training program.

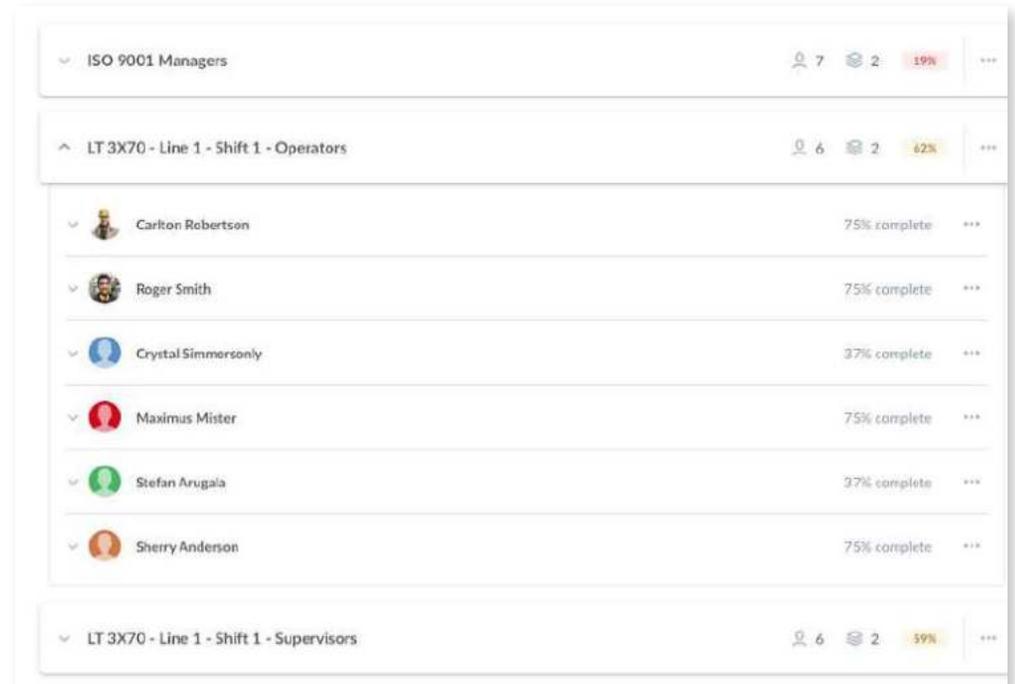


In Dozuki, groups of workers can be assigned to teams to automate training. When someone moves into a new facility, line, or shift, the related training is instantly assigned to them.

Track Training with Digital Tools

Rather than relying on massive training matrixes that are notoriously difficult to keep updated, tie training programs directly into skills reporting.

This enables for a scalable solution that provides instant visibility into who is trained to the latest version of any documented standard.



Employee training can be tracked in instant dashboards from Dozuki. Managers gain visibility into the real-time progress of teams and individuals.

Verify with Digital Forms

Before, during, or after training, digital forms can help with evaluating training efforts. Collecting this information from employees helps inform both their comprehension and skill level.

If implemented during the training, questions can keep the process engaging while also reinforcing knowledge.

The screenshot shows a digital training interface for a machine. The title bar reads "Run the Machine" and includes an "Exit Operator View" button. The interface is divided into three main sections:

- Visuals:** On the left, there are two images of the machine's control panel. The top image shows a lever being pushed forward, with a yellow box and arrow highlighting the action. The bottom image shows a close-up of the rollers and a curved plate.
- Instructions and Safety:** On the right, there are two main instructions:
 - Push the control panel lever forward to pull the plate through the machine.
 - Hold the curved plate with your right hand as it leaves the machine.Below these are three safety warnings:
 - ⚠ !! SAFETY CRITICAL POINT !!
 - ⚠ Do not attempt to grab the plate. Place your hand out in front of the rollers and allow the plate to come to you.
 - ⚠ Grabbing or reaching for the plate could result in a serious injury.
- Progress and Validation:** At the top right, it shows "GUIDE 1:25 3:35" and "STEP 1:47". Below this, it says "Step 4 of 8" and asks "Did the trainee SAFELY hold the plate it left the machine?". There are two radio button options: "Yes" (selected) and "No". At the bottom, there are buttons for "Back", "Next Step", "Cancel", and "Suspend".

Dozuki walks people through step by step virtual training, pausing when validation or approval is needed. Supervisors can sign-off on a technique or completion of training from their desk, a tablet, or in person.



Tribal Knowledge: The Dangers of Losing It

Why tribal knowledge can be difficult to capture, and what that lost investment means for workforce training.

As the skills gap widens and more employees retire, decades of experience and company investment is predicted to walk out the door. With nearly ten thousand people turning retirement age daily, manufacturers will need to look towards proactive solutions to capture tribal knowledge and transfer it to the incoming workforce.

While every industry is inherently dependent on the knowledge of its workforce, none may be quite so reliant as the modern manufacturer. Where the unexpected can occur suddenly and the planned must be delivered to exacting standards, the knowledge of a seasoned operator can be invaluable when preventing downtime or rework.

Why then, in the face of a retiring workforce, are companies still failing to capture this knowledge they've so heavily invested in — before it walks out the door?

A COMMON STORY: **AVOIDING DOWNTIME**

Members of on the day shift have been at a food production company for over 15 years, those on the night shift have less than 4 years of experience. One night, a downtime issue brings production to a standstill, with the shift's maintenance team troubleshooting for over 11 hours with no resolution.

Once the day shift change occurs, the issue is fixed within 5 minutes.

11 hours of downtime could have been prevented if the knowledge of the day shift experts was captured for the night shift to use.

The Dangers of Lost Tribal Knowledge

In the manufacturing environment, meeting standards while overcoming the unexpected is a rare skill held by only the most experienced workers -- the gatekeepers of tribal knowledge. These are the workers who don't just plug holes in the dam, they recall every attempt, result, and why the current standard exists.

When a problem arises — they know exactly what to do.

More often in the factory environment, tenured workers who were part of the 'original crew' and know everything about the operation are still on-staff and available to solve problems or train others. New hires, apprentices, journeymen, management -- all rely on their know-how.

Small problems become major obstacles when they're not around; and yet, the business operates as if they always will be. Work experience like this is not only an intangible asset but

one of a manufacturer's strongest competitive advantages. In most companies, these gatekeepers gained their expertise as a consequence of hands-on experience, outside of formal training programs.

When these employees leave, they take all of their expertise with them. This is why that in the face of a massive job skills shortage, companies should work to understand where their tribal knowledge is hidden and seek to capture it.

Without access to this knowledge, new and poorly trained workers face stressful trial-and-error scenarios — leading to increased overtime, downtime, and cycle time. A situation that perpetuates attrition of new-hires and is nearly impossible to stop through recruitment alone.

“It is not enough to do your best; you must know what to do and then do your best.”

–W. Edwards Deming

Why Knowledge Goes Uncaptured

As more companies gain awareness of this issue and more experienced employees retire, the push for knowledge capture is quickly becoming a top initiative. Yet, even with a concerted effort to capture tribal knowledge, it can be a significant struggle to make headway. Understanding the common reasons why knowledge goes uncaptured can help you identify where valuable knowledge is hidden.

Job security

Many workers share the sentiment that they're scared to document themselves out of their job. By being the only person who knows how to do something, the feeling of job security and esteem is increased. Some workers would rather be relied on as the expert, instead of sharing their expertise and risk becoming less integral to the operation.

Workarounds are “bad”

People naturally find workarounds in their daily operations. However, this often means that work isn't being “done by the book.” If a company doesn't embrace continuous improvement, workers will often keep these shortcuts a secret to avoid penalty.

Time investment

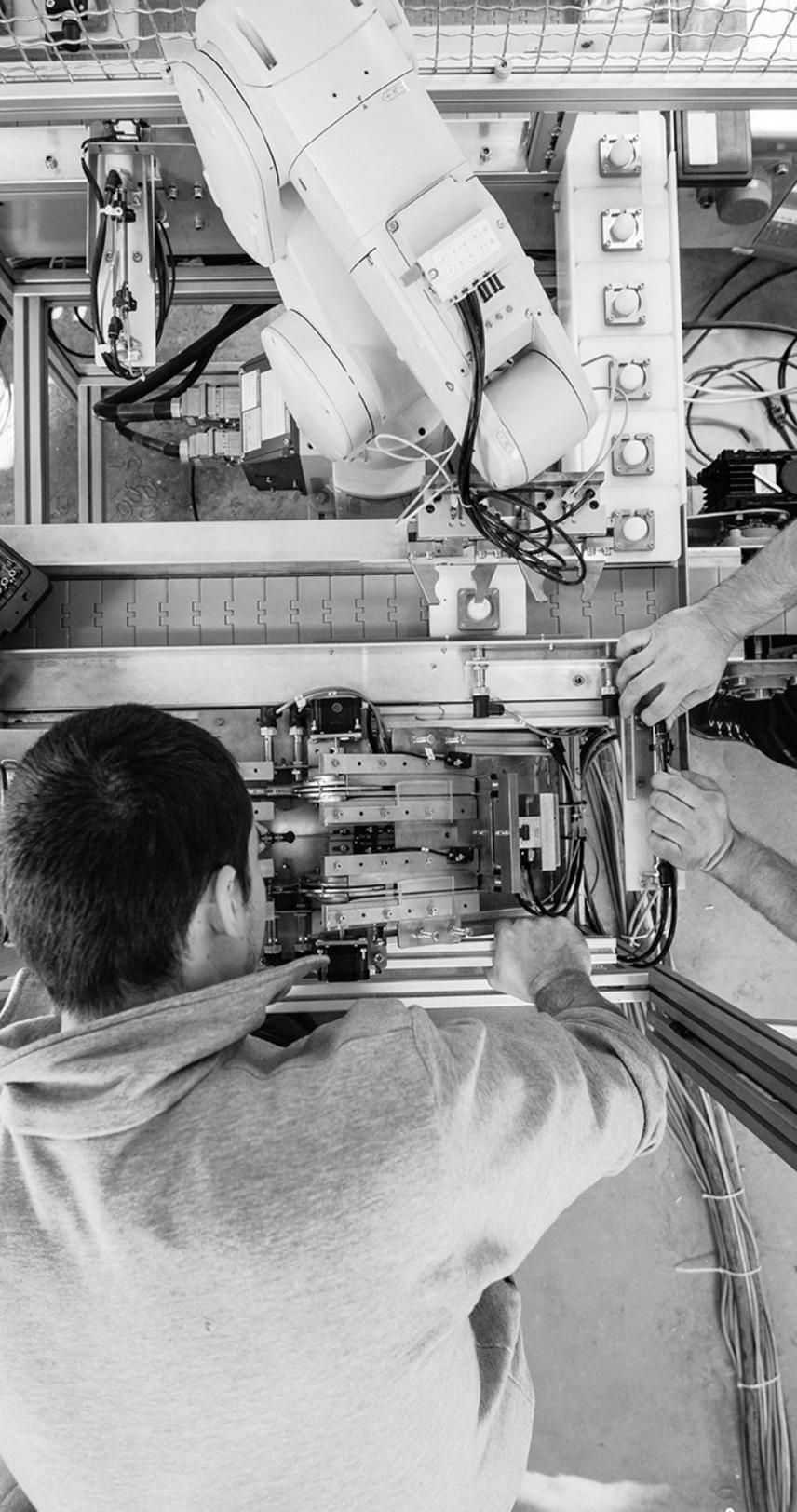
Thoroughly documenting the expertise of a workforce and turning it into a skilled training program is no small order. If you're building a 3-5 year training program, don't be surprised if a time investment of 3-5 years in knowledge capture is required.

Personality types

Many of your in-house experts have spent the past 10-30 years accumulating knowledge without a need to document it. Nor have they been asked to or shown an easy way to do it. Quite simply, your gatekeepers aren't necessarily best suited for the job of documenting.

No Apprenticeship

Many times, a lack of formal apprenticeship programs prevents valuable tribal knowledge from being transferred. If there is no apprentice to pair with your expert, the likelihood of that expert's knowledge being documented is significantly reduced.



Strategies for Capturing Tribal Knowledge

Practical advice for capturing the knowledge of your experts to tackle the skills gap.

The incoming workforce is thoroughly skilled in digital user interfaces — spending endless waking off-hours on their personal mobile devices. These “digital natives” expect all of their learning and training to take place through a screen.

Businesses should seek to capitalize on this inclination as a way to bridge the generational divide between experienced employees and the new workforce. It’s here, at the crossroads of outgoing experts and incoming digital natives, where companies can see success capturing outgoing knowledge.

Create Co-Mentorship Programs

Manufacturers must lean into technical solutions to capture the knowledge of retirees while engaging and training the upcoming generation of manufacturers.

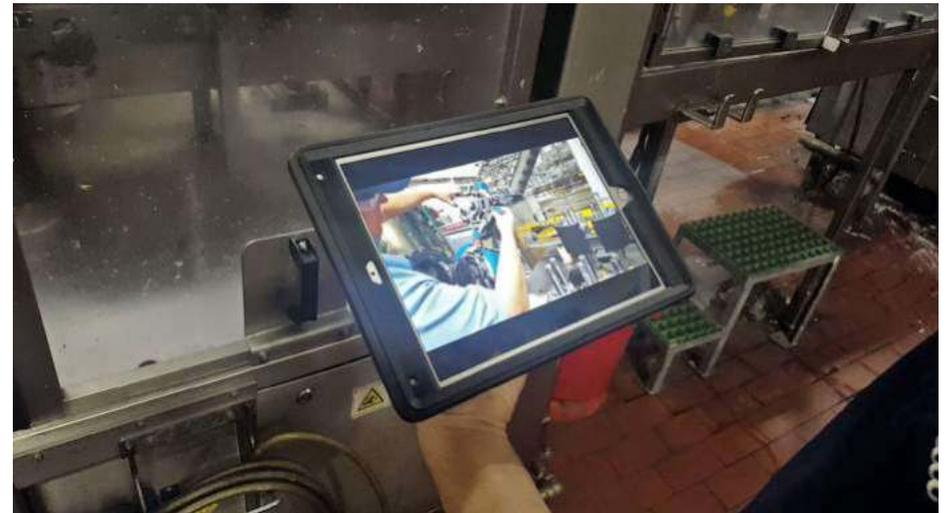
As the new workers use digital devices to record and document tribal knowledge, experienced veterans can simultaneously learn how to use digital tools from these digital natives.

Process documentation software, like Dozuki, can help unite workers around a common goal. By leveraging the experience of your retiring workforce and the technical skills the incoming, transitioning to new training strategies can be an empowering experience for both parties.



Use Videos

Make knowledge capture faster with video. Taking a video to capture core processes can be a simple way to record tasks and then supplement with additional information and text later.

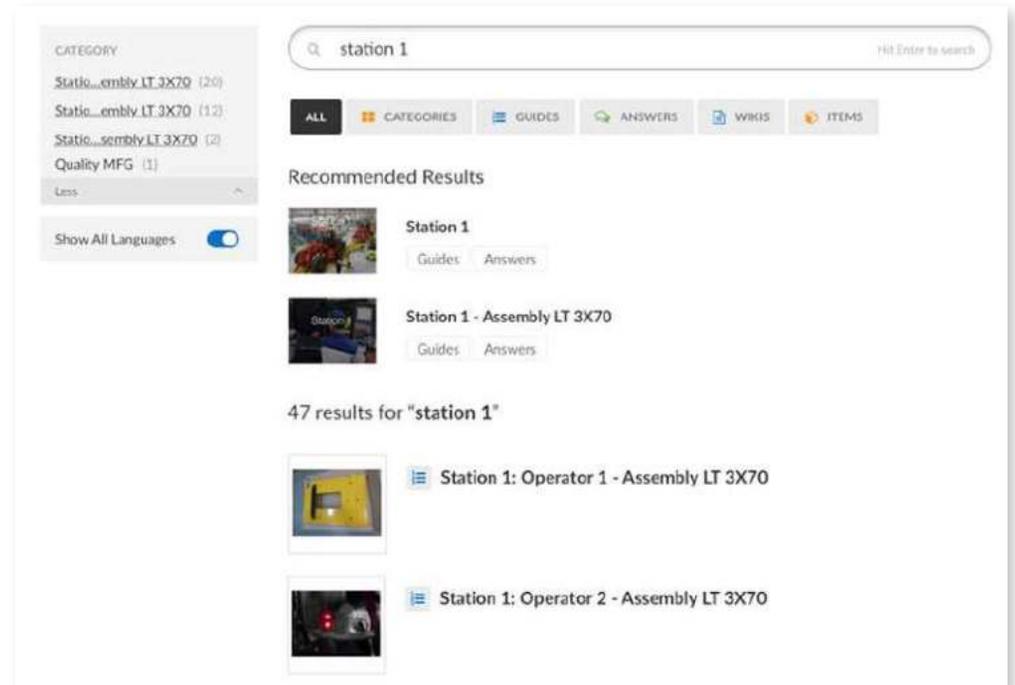


Dozuki allows you to record video footage directly on the floor, enabling you to easily capture process knowledge before it's gone.

Make Knowledge Easy to Access

Some of the most valuable tribal knowledge for a manufacturer is the know-how to solve problems quickly, such as troubleshooting equipment failures. This type of knowledge can be difficult to capture because certain circumstances can be rare, and documentation may not be a priority when there's a problem on the floor.

Many times access to documentation is the biggest obstacle to an employee's success. When information is difficult to access, employees are discouraged from following established standards and create risk by trying to figure things out on their own.



Dozuki is indexed and searchable, making the solution easier to access and find, just like a Google search.

Leverage QR Codes

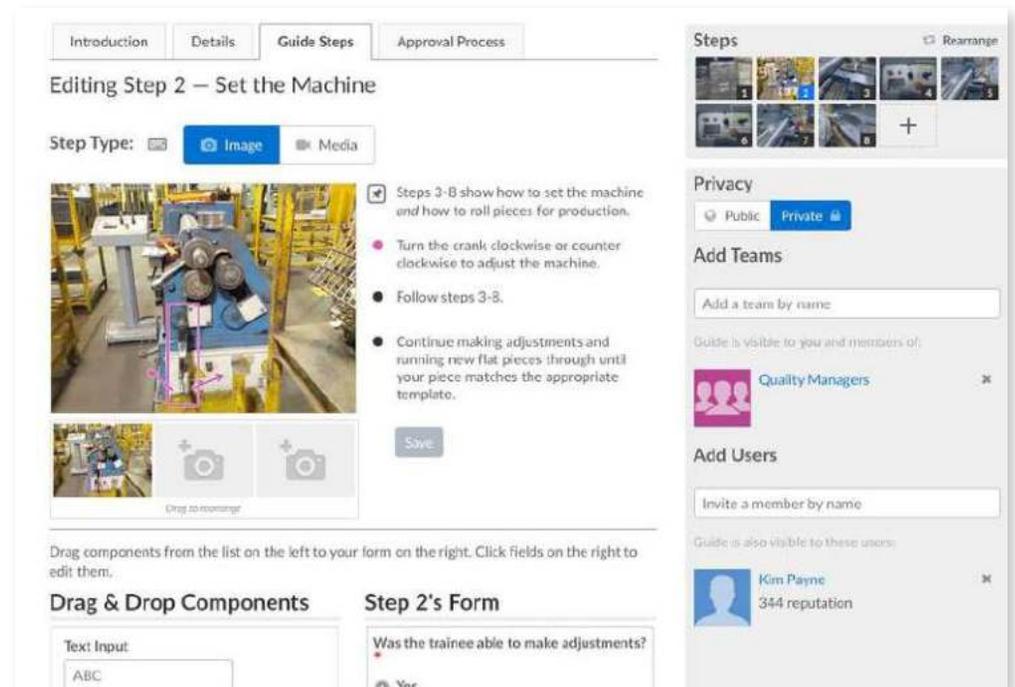
Control the information like safety procedures, preventative maintenance records, assembly instructions, etc. by creating unique QR codes that lead directly to the necessary information for quick access.



Using Dozuki, QR codes can be accessed instantly with a quick scan from a mobile device. The proper information is only a scan away.

Make Knowledge Easy to Document

When it's quick to capture expertise, it becomes an integral part of company culture. Look for digital tools that make combining photos, videos, and written text into a procedure painless.



Dozuki is built to be user-friendly, making it simple to build a digital library of company procedures and interactive visual guides.

DOZUKI

Training for the Youtube Generation

Dozuki makes it more intuitive than ever to capture, access, and leverage expert knowledge throughout your industrial workforce.

Companies who implement training programs with Dozuki are able to upskill workers quickly and accurately—every time.

Learn more at dozuki.com



ABOUT DOZUKI

2011 year founded

440 customers across 38 countries

3.5m active users

FROM OUR CUSTOMERS

61% reduction in document creation time

40% reduction in training time for new employees

67% report improved workforce communication



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