

Enabling **Connected Workers** to Accelerate Total Productive Maintenance & World Class Manufacturing

Insights on how a **Connected Worker** Platform enables and accelerates Operational Excellence, TPM, Lean and WCM by providing the front line workers with the right information at the right time and at the point of use.

Zaptic E-Book

Key Takeaways

Why is a **Connected Organisation** so important and how can you achieve this?

How can you best enable, empower, and motivate your people?

How can a **Connected Worker Platform** help you adopt WCM/TPM/Lean faster?

How Zaptic supports each pillar in TPM/LEAN.

Suggested use cases that can be digitised easily and quickly.

The key benefits of digitising daily processes.

What is WCM/ TPM/ Lean?

TPM, Total (Productive or Preventive) Maintenance

is an approach to equipment maintenance that strives to achieve perfect production results.

WCM, World Class Manufacturing

is a philosophy of being the best, the fastest, and the lowest cost producer of a product or service, and often implying a continuous improvement pursuit of these outcomes.



How your **Connected Workers** achieve **Operational Excellence** results through **TPM/WCM/Lean**

TPM

Total Productive Maintenance

Safety, Health & Environmental

Autonomous Maintenance

Planned Maintenance

Quality Maintenance

Focused Improvement

Early Equipment Management

Training & Education

TPM in Administration

Communication & Collaboration Underpins Operational Excellence

Connected Workers are essential to achieving your business results

Your organisation is always working to accelerate and deliver improved performance in Manufacturing & Supply Chain, regardless of the program name:

TPM - Total Productive Maintenance

CI - Continuous Improvement

6 Σ - Six Sigma

LEAN - Lean Operations Initiatives

Whatever you name your Operational Excellence effort, it's likely based on one or a combination of the above.

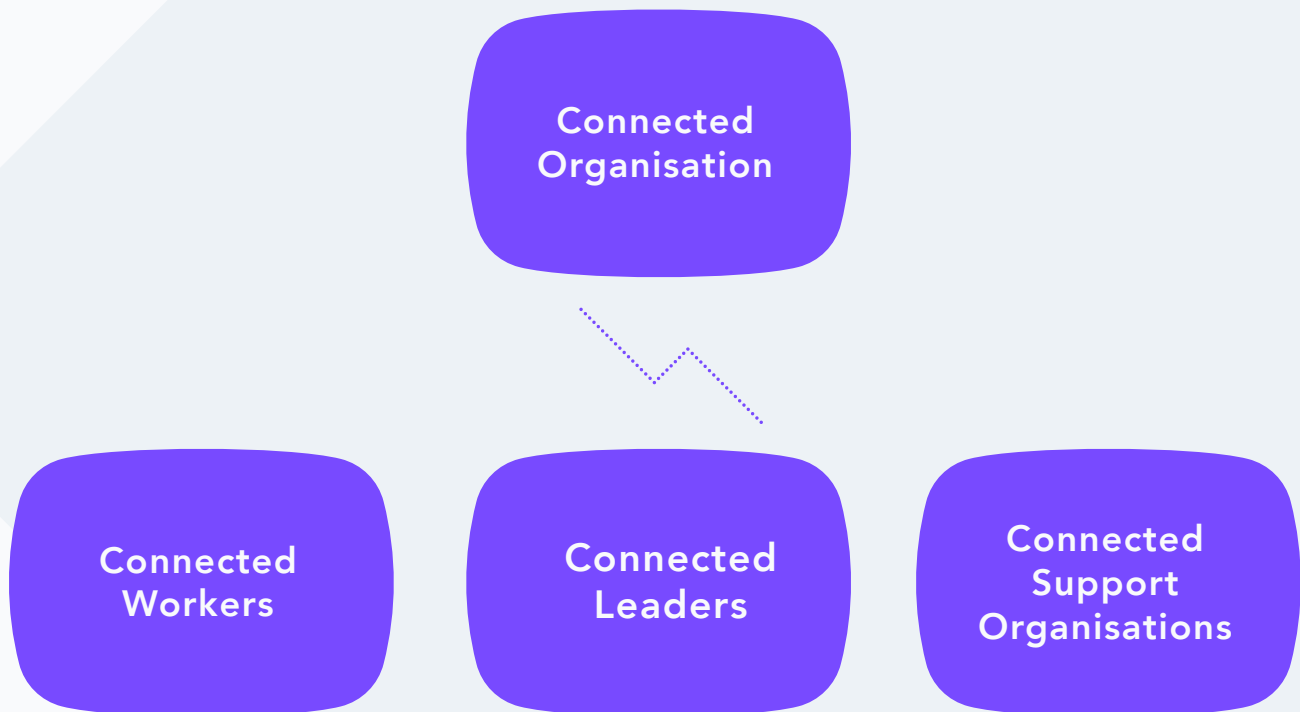
Engaged, motivated, autonomous Connected Workers achieving excellent results are best enabled by **a Connected Worker Platform.**

A Connected Worker Platform offers a proven solution that “connects” your team as never before to **achieve acceleration and results.**

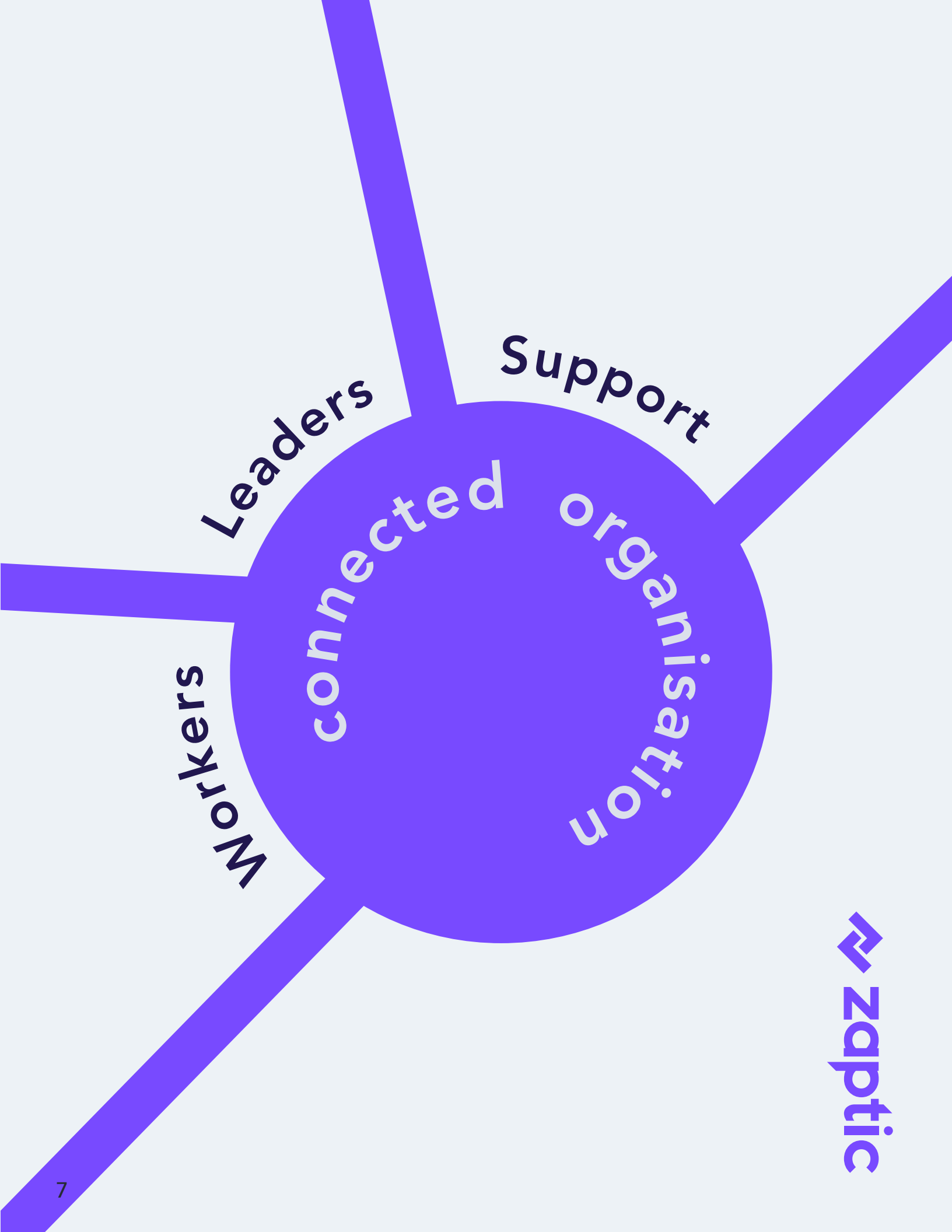


A platform for **Connected Workers** is not an island in the organisation

Success is enabled by leveraging the information, communication, and collaboration capabilities in the teams, across the plant, and with critical **support organisations**.



Leaders must serve and enable their **connected workers** to overcome obstacles, encourage innovation, and reward success.



Connected Workers

Without workers and frontline staff, manufacturers would not have a business to operate. It is becoming increasingly difficult to find, attract and retain talent. With an aging population, it has never been more important to capture and share tribal knowledge.

The Front Line Worker of today needs a digital solution to provide the right information at the point of use so they can consume the right knowledge at the right time to deliver a perfect quality product, on time and on cost.

How to clean conveyor
by Ben Marr

Filler Machine A

Timeline About Tasks Reports Guides

Debra mentioned Filler Machine A on the Safety Walkabout report
Just now

DR Debra Rice completed a report
Just now

Conveyor has a tear and is makin...
#4587

12 ACTION PENDING

CIL
Due in 5 hours Operators

Max Pressure	10
Air consumption	5 bars
Optimal temperature	60

Filler Machine A
Area 1 > Production Line 2

Connected Leaders

Leadership in the Connected Organisation changes the dynamic of information with democratisation.

- Zero Information Lag
- Silos of Information Evaporate Over Time
- New Information Requires Action

Leaders understand that information the connected worker needs must be there how and when they need it. It must be available in a single context and not spread across different places so it has to “be found” when needed. As the work is done, new information will be identified that requires action to drive improvement and achieve success.

**Good Data
& Information
= Good decisions
= Great results**

Connected Support

The Connected Worker has total ownership for the outcomes where the work is done. The “work” requires standards that can be met to achieve the safety, quality, output, and cost goals. Connected Support exists to help create these standards with the workers that complete the work.

Standard Work Requires Standards

Focused Improvement is Challenging

Education/Training is Critical

As work is done, defects are found and standards are missed. Workers then need support in getting to the root cause, adjusting the future standards and finding best practices. Those future standards often require development in skills and capabilities delivered to the organisation by Connected Support.

Core Enablers

Total Productive Maintenance (TPM)

- Safety Health & Environment
- Autonomous Maintenance
- Planned Maintenance
- Quality Maintenance
- Focused Improvement
- Training & Education
- Early Equipment Management
- Office TPM

LEAN (Toyota Production System)

- Stability
- Standardized Work (GEMBA)
- Automation (Jidoka)
- Continuous Flow (JIT)
- Built on the principles of TP

PEOPLE – Respected, Engaged and Enabled

Connected Workers

The connected worker is uniquely positioned to lead the direct efforts at improving the results in manufacturing.

Providing the information each person uniquely needs when, where, and how they need it is the essential component to enabling a connected worker.

Today's connected worker expects this information served digitally, in a single pane of glass reflecting the most current conditions in their operations, assets, and fellow team members.

A connection that informs and enables their activity with the most efficient correct actions, and an ability to collaborate as needed when unexpected challenges present themselves.

Their connections are viewed as an essential tool in their execution of Total Productive Maintenance (or whatever you call your program).

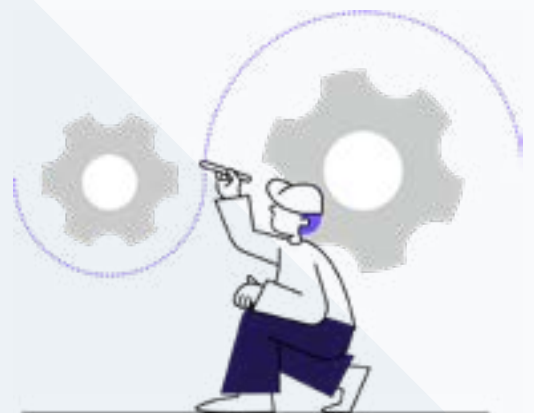
Performance in Manufacturing is still reliant on people

People are the biggest driver of value and variability in production. However, the information people need to do their daily work resides in too many places, which are often outdated and difficult to use. Resulting in more variability, and making it harder to drive value. It can reside in:

- Paper and spreadsheet-based procedures, checklists and problem solving tools.
- In siloed apps and core IT systems such as ERP, EAM, PLM, which were never designed for the people who do the actual work.
- In peoples' heads as 'tribal knowledge', which is eroded with employee turnover.

Different work systems – Total Productive Maintenance (TPM), Six Sigma, LEAN and IWS – have delivered impressive results with tools that reduce variability and empower frontline workers to drive improvement.

However, the biggest complaint of workers is that they add more paperwork, and more places to get work done and follow standards.



How does Zaptic enable TPM?

Safety, Health & Environmental

Autonomous Maintenance

Planned Maintenance

Quality Maintenance

Focused Improvement

Early Equipment Management

Training & Education

TPM in Administration

Leadership standard work E.g Gemba, 5S, Coaching on the floor work processes and health checks of the key pillar processes.

SHE

Live capture of SHE defects and problems, auto escalation and routing for help, Behaviour Observation capture, Safety stds and training, eg LOTO.

AM

Autonomous maintenance by the operators scheduling, defect finding and fixing, live capture of defects, center lines, access to guides / standards.

PM

Planned and Predictive maintenance. Live capture of breakdowns and defects, asset knowledge, integrations / WO's.

QM

Live capture of Q defects and problems, auto escalation and compliance, clear guides and standards always up to date.

FI- 5S and 6W2H

Live capture of problems, escalation and routing for help RCA, knowledge capture and sharing.

EQM

Capturing best standards and Kaizens for future equipment design.

Commissioning and start up defect capture and resolution.

T&E

Capture skills and visualise gaps, knowledge capture and sharing, schedule training online, compliance.

AOM

Any paper or spreadsheet work process can be digitised and visualised reducing losses.

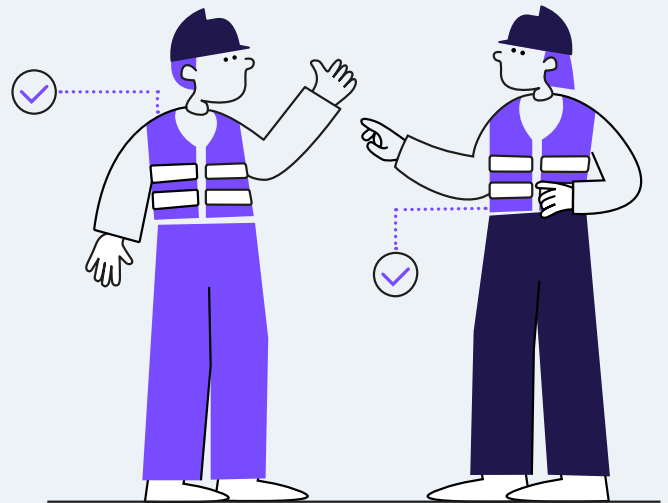
Safety Health Environment

- Perform work safely.
- Ensure work does not create hazards to workers health or environment.

Ensuring the Safety, Health, and Environmental well-being of your people (and customers) is core to TPM.

As people “do the standardised work”, their connection makes sure they have the skills, qualifications, and most up to date information for each task. This includes equipment and material hazards, checklists, skill gaps for the work required, actions required for safe work (lock out, tag out), and more. It also informs other team members of work being done so they can be safe and provided needed support if required.

The skills and requirements here are updated and reflected in the Training & Education, Quality, and Early Management pillars of TPM. The closed loop of information builds to eliminate harmful conditions now and in the future.



How it helps:

- Maintain a safe and healthy working environment.
- Eliminates potential health and safety risks, resulting in a safer workplace.
- Specifically targets the goal of an accident-free workplace.
- Reduces potential environmental and waste costs.
- Ensures compliance to relevant legally mandated laws and conditions.
- Tracks EHS behaviour and cultural indicators enabling rapid countermeasures to be taken.
- Able to insure only qualified workers get tasks assigned that meet the requirements of their current skill level.

Safety, Health & Environment in Zaptic:

- Dynamic Risk Assessment.
- Near miss.
- Accident/Incident.
- Start of shift checks.
- Safety trigger sheet.
- Behaviour Observations.
- EHS events.
- Safety Audits.

Autonomous Maintenance

- Prevent equipment deterioration through proper operation.
- Bring equipment to, and keep it at, "like new" status through restoration and proper management.
- Create Equipment / Asset Owners.

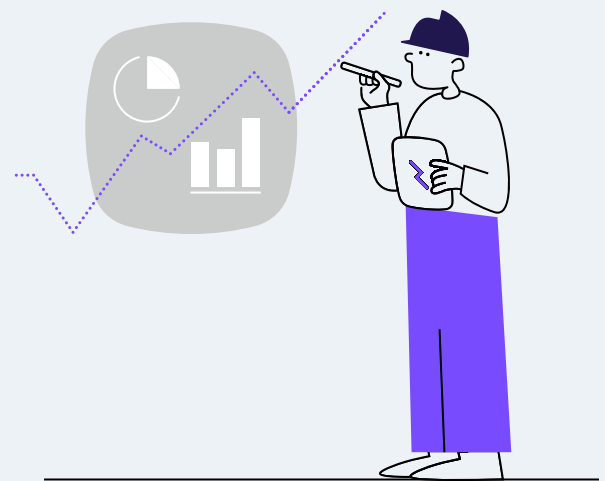
Stability is Standardised Work (proper operation) performed at Gemba (the actual place) and working to restore base "like new" condition to equipment.

The proper operation is documented on their connected device, validated for their performance of the operation (skill/training).

During operation connected workers identify "defects" to base conditions digitally, one-time without repetition, visible to everyone (floor to door) responsible for correcting at root cause those defects. Their single pane of glass supports identification in written form, verbally or visually (photo/video).

The conditions of like-new and actions required (5S) are detailed in all those forms visible to them whenever required. The status of their's and other's activities to complete restoration supports a collaborative effort and brings the needed skills when required by reaching out to those required.

When root cause efforts identify needed changes in standards, operations or training those are reflected to everyone for action.



Operator lead autonomous maintenance in Zaptic

How does it help?

- Gives operators greater "ownership" of their equipment.
 - Increases operators knowledge of their equipment.
 - Ensures equipment is well-cleaned and lubricated.
 - Identifies emergent issues before they become failures.
 - Frees maintenance personnel for higher-level tasks.
- Clean Inspect Lubricate (CIL).
 - Centerlining.
 - Defect Handling/Tag/Issue escalation.
 - Start of shift checks.
 - Work Request / Maintenance Request.
 - Asset (aka Equipment) Operating Rounds.
 - Start of the shift checks.
 - One point lessons and guides to enable operators to follow current best agreed standards.
 - Daily shift cycle management.
 - Visualisation of defects and actions.

Planned Maintenance

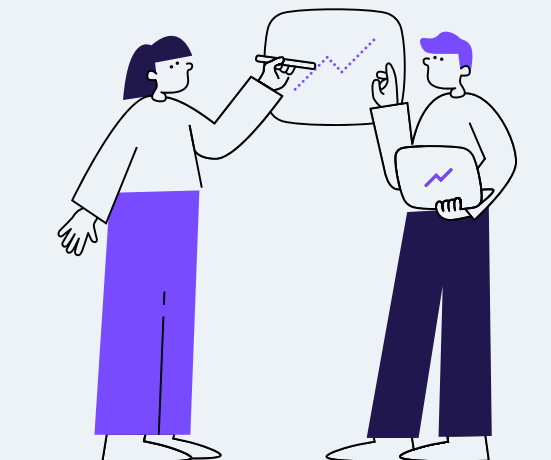
- Proactively engage to ensure the Stability of assets while they are performing work.

Unplanned failures and the accompanying work always costs more, creates more uncertainty, reduces asset life, and increases risks to people.

People and Assets always perform optimally in a **“stable planned environment”**. Most people and organisations don’t respond well to surprises.

A connected worker has the best information available to respond better to surprises when they do occur. But, having the information needed to perform planned work, in collaboration with team members, informed by the schedule of operations to avoid surprises is the ideal.

Having the single pane of glass providing asset performance information and scheduled requirements to create the planned work is our goal. The connected team plans better, faster and more completely. The **stability** of these operations support improvements in **continuous flow (JIT)**.



How does it help?

- Significantly reduces instances of unplanned stop time due to breakdowns.
- Enables maintenance to be planned and scheduled with production.
- Reduces inventory through better control of wear and failure-prone parts.
- Reduces maintenance time and costs.

Planned maintenance in Zaptic

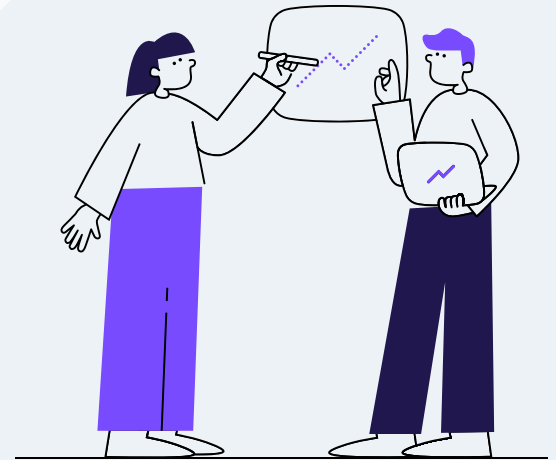
- Scheduled maintenance tasks based on predicted and/or measured failure rates.
- Breakdown elimination 6W2H and RCA.
- Equipment Routine inspections.

Quality Maintenance

- Ensure defects are resolved and standards updated for base conditions and operating standards.

Defects create unplanned failures in operations or products. Identification, root cause solutions, and updated standards work to eliminate future defects.

Connected workers can identify, characterize, and detail (text, audio, photo video) defects more quickly and effectively. They can share and collaborate to define the needed work for root cause elimination and updated operations standards.



How does it help?

- Specifically targets quality issues with improvement projects focused on removing root sources of defects.
- Reduces the number of quality related and visual defects.
- Reduces cost by catching defects early (it is expensive and unreliable to find defects through inspection).
- Reduces quality related holds of finished product stock.
- Reduces instances of miss label, miss batch coding and miss date coding by having clear and agreed standards available online.
- Speeds up resolution of Corrective and Preventative actions (CAPA) and other quality related actions.
- Enables compliance with legally required food safety, FDA, Cleaning and sanitization and other legally required legislation.

Quality Maintenance in Zaptic:

- Batch production checks.
- 5S Audits.
- Continuous improvement.
- 5WHY and root cause analysis.
- In-line product quality checks.
- Final product inspections (TAMU checks).
- Quality tags (Defects).
- Quality complaint form.
- Non conformance report.
- Opportunity customer improvement.
- Opportunity quality improvement.
- Concession process.
- Audit.

Focused Improvement

- Eliminate identified defects at root cause, creating new or approved changes to standards.

Your “Kaizen” (change for the better) efforts follow a rigorous process of identification, evaluation, experimentation, validation, and documentation.

Ensuring your connected workers have the information and workflow tools to support kaizen are critical for locking in the performance improvements that drive results.

Focused Improvement efforts engage a large part of the organisation in often longer-term efforts at root cause elimination.

Getting the connected worker engaged at the point of failure and through the improvement process with robust collaboration gets more of their brains into the solutions.



How does it help?

- Provides operators problem solving tools to fix and restore base condition defects in machines, training, methods, standards and materials.
- Enables small groups of employees to work together proactively to achieve regular, incremental improvements (Kaizen) in equipment operation.
- Enables kaizens to be turned into new standards and best practises that can be approved then immediately shared with the teams.
- Recurring problems are identified and resolved by cross-functional teams.
- Combines the collective talents of a company to create an engine for continuous improvement.

Focused Improvement in Zaptic:

- Kaizen, Improvement suggestion.
- Gemba walks and inspections.
- 5S Audits.
- One point lessons and new guides and standards.
- 6w2h and RCA.

Training & Education

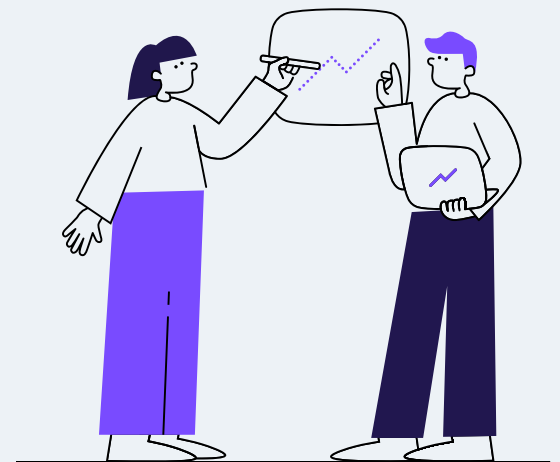
- Show the respect, engagement, and enablement to people by providing the needed skills for success today and in the future.

Your people are the ones responsible for the daily work, identifying defects, and implementing changes needed to drive long term improvement.

The greatest sign of respect to your people is connecting them to the needed training and education for all, now and in the future. Engaging them in the requirements, development, and deployment of training and education is essential for success.

Information on the needs, and the resulting content to meet those needs, is enabled by engaging everyone in a connected collaboration that supports input from anyone at anytime.

Deployment of training is often asynchronous, and a connected worker platform supports the delivery and validation when and where the need exists.



How does it help?

- Identify training needs and gaps in individual and team knowledge.
- Fill in knowledge gaps necessary to achieve TPM goals. Applies to operators, maintenance, and managers.
- Operators develop skills to routinely maintain equipment and identify emerging problems.
- Maintenance learn techniques for proactive and preventative maintenance.
- Managers are trained on TPM principles as well as employee coaching and development.

Training & Education in Zaptic:

- Work instruction.
- One click help.
- Training & SOPs.
- Onboarding of employees.
- Skill matrices.
- Training and onboarding.
- Qualification tracking and refreshing.

Early Equipment Management

- Proactively engage to ensure the Stability of assets while they are performing work.

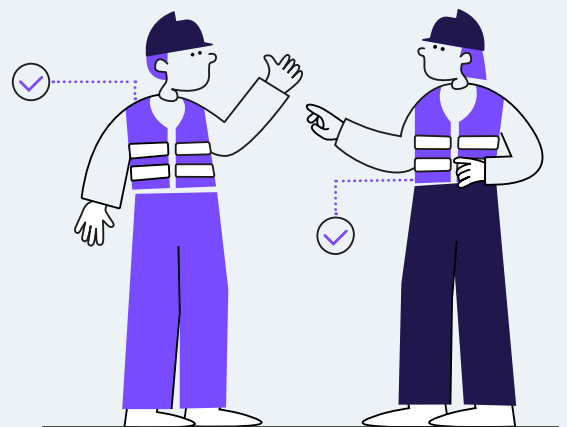
Poor design and start up of assets always costs more, creates frustration and adds huge costs to a business.

It costs 10X more to fix a problem with a new asset after it is installed. EQM, if done properly, can increase the confidence in getting the asset right first time and aid vertically start up at lower costs overall.

A connected worker has the best information available to input into engineering with the right standards, to enable easy maintenance of any new asset.

Having asset standards captured and knowledge available to the engineer can vastly speed up the quality of design and how assets are brought in and started up in a factory.

A connected worker solution can also be used in vendor acceptance tests to identify defects and capture issues for resolution.



How does it help?

- Directs practical knowledge and understanding of manufacturing equipment gained through TPM towards improving the design of new equipment.
- New equipment reaches planned performance levels much faster due to fewer start-up issues.
- Maintenance is simpler and more robust due to practical review and employee involvement prior to installation.

Early Equipment Management in Zaptic:

- Finding and fixing defects.
- Creating new guides and standards for effective AM/PM.
- Capture commissioning and vendor acceptance testing defects and resolving them.

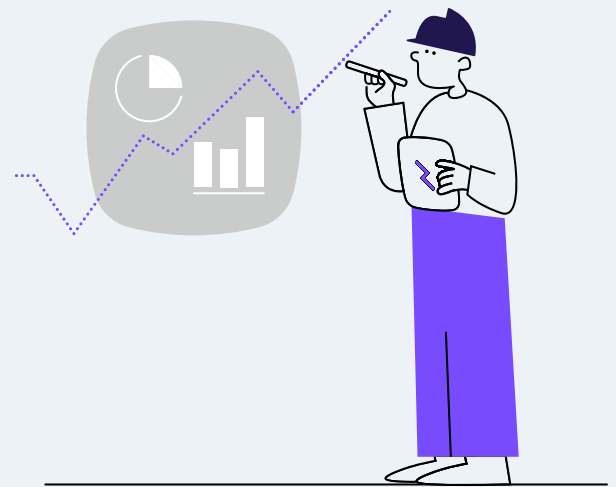
Office TPM

Although called Office TPM, this pillar, its content and processes cover any work process that is used throughout the supply chain that is predominantly paper or spreadsheet driven.

Work processes can be captured in Zaptic, the steps created into a workflow with data being captured to aid loss reduction and streamline the work process.

Most work processes can have 40% waste built into them over the years. For example, double entry of data, unnecessary steps, inaccurate information or lack of maintenance and upkeep to ensure the standards are upto date and accurate.

By digitising the work process into a workflow you can also determine if they are accurate and as efficient in their steps as possible.



How it helps:

- Apply TPM techniques to administrative functions.
- All processes that support manufacturing can be targeted to become defect and loss free.
- Extends TPM benefits beyond the equipment by addressing waste in support and administrative functions.
- Supports production through improved administrative operations (e.g. warehousing, order processing, scheduling, procurement, quality assurance).
- Use core capabilities of other pillars to improve effectiveness of administration functions, eg E&T.

Office TPM in Zaptic:

- Defect raising, tracking and resolution.
- AM/PM functionality and use cases used in support functions eg Labs, warehousing and Material supply.
- Clear standards and digitise paper / spreadsheet workflows.

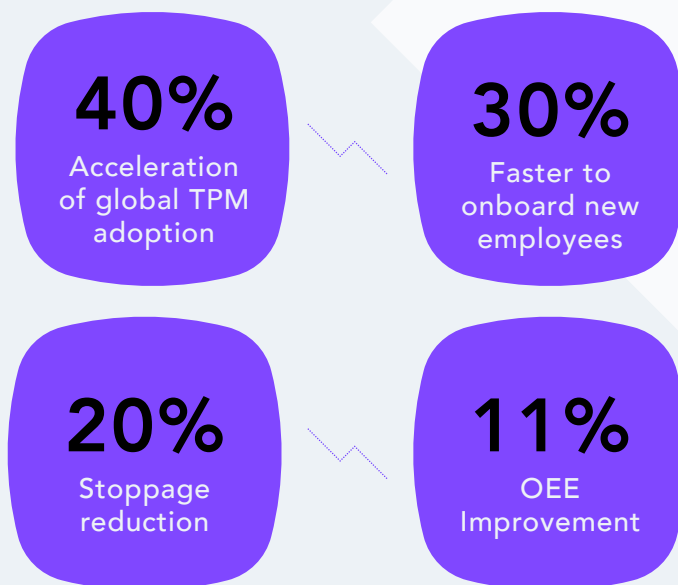
**By Enabling Connected
Workers, Zaptic
Customers have
experienced huge
improvements in time,
finances and efficiencies**

“Zaptic enables the operators to do what they need to do and by doing so, we drive Overall Equipment Effectiveness (OEE) Improvement.

“Zaptic also enables operators in an easy way to highlight unsafe conditions to solve them quickly, eliminating possibilities of accidents.”

Carlos Zaramello, **Senior Director**
Continuous Improvement
Carlsberg Excellence

Results



The Connected Worker Platform that accelerates transformation results

Supply chain leaders partner with Zaptic to digitise operations for frontline teams, empowering workers with the information and tools they need to drive operational excellence.

Book a Demo

To find out more, [book a demo](#) to see how Zaptic can help your organization drive operational excellence, reduce loss and [connect workers](#).



Visit our website to learn more

www.zaptic.com