

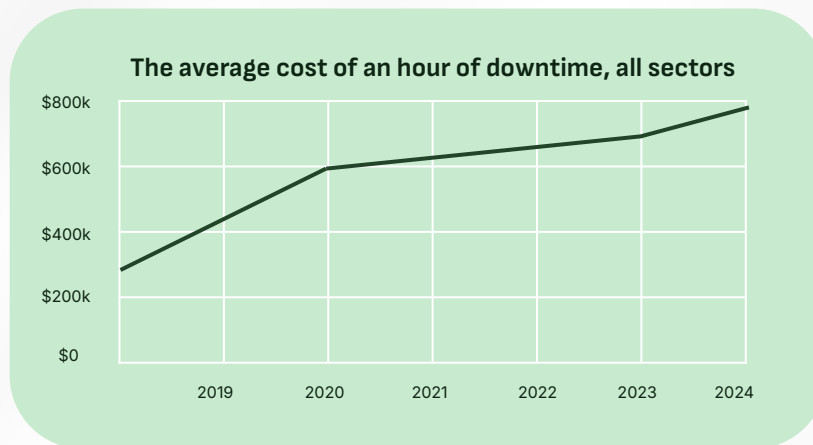
MAINTENANCE AS THE BEDROCK

Leveraging Manufacturing Intelligence to Eliminate Downtime

Eric Whitley - Director of Smart Manufacturing

Downtime = a **\$1.4 trillion** problem

An average large plant sees 27-60 hours of downtime per month - and it's rising!



... directly impacting your ability to **profitability meet demand**

Top contributors to downtime and escalating costs



Equipment failures

Failures resulting from machinery and equipment issues can cause severe disruptions

Component Wear & Tear
Electrical Failures
Improper Maintenance
Calibration Errors



Human errors

Mistakes made by operators, technicians, or maintenance personnel can lead to inefficiencies and downtime

Improper Operation
Maintenance Mistakes
Insufficient Training
Safety Risks



Production issues

Inefficiencies within production processes can severely disrupt operations

Bottlenecks
Lack Standard Work
Process Control Failures
Improper Scheduling



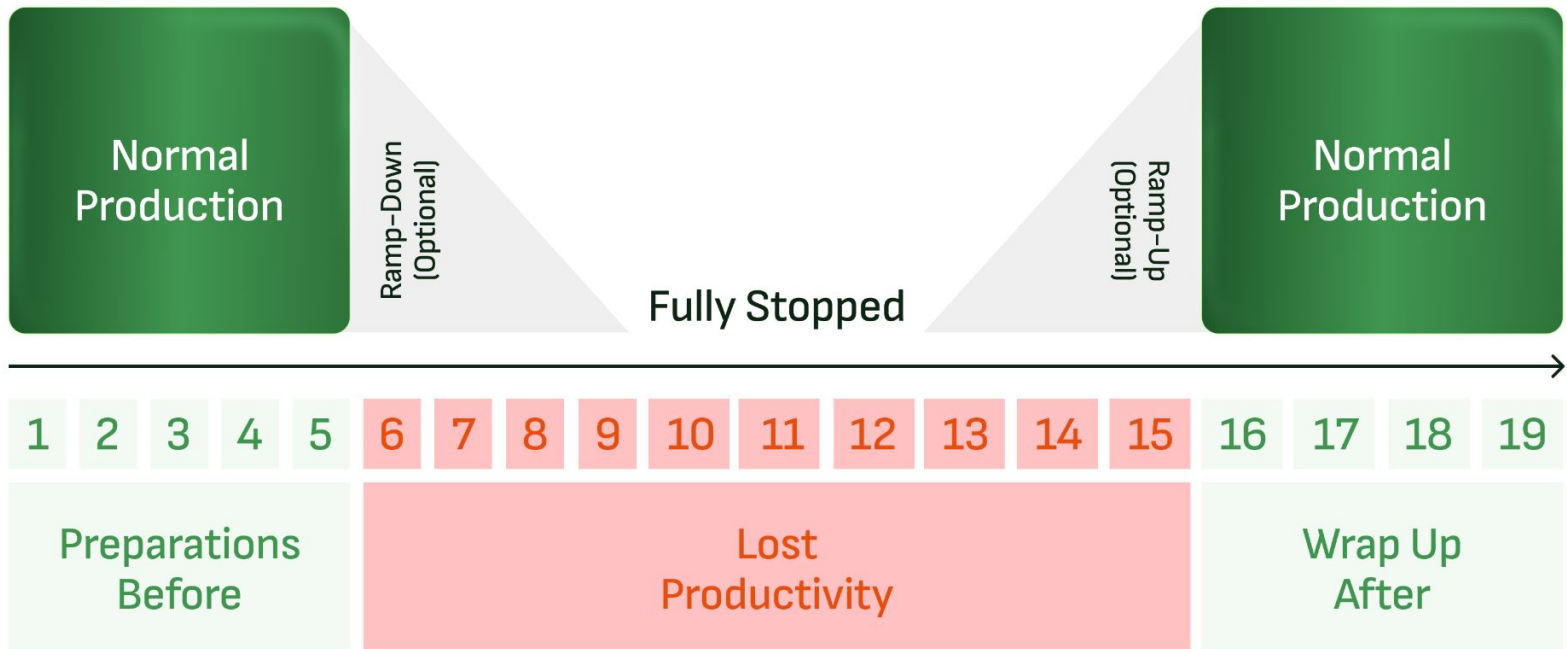
Quality problems

Issues stemming from poor quality inputs, processes, or standards disrupt production

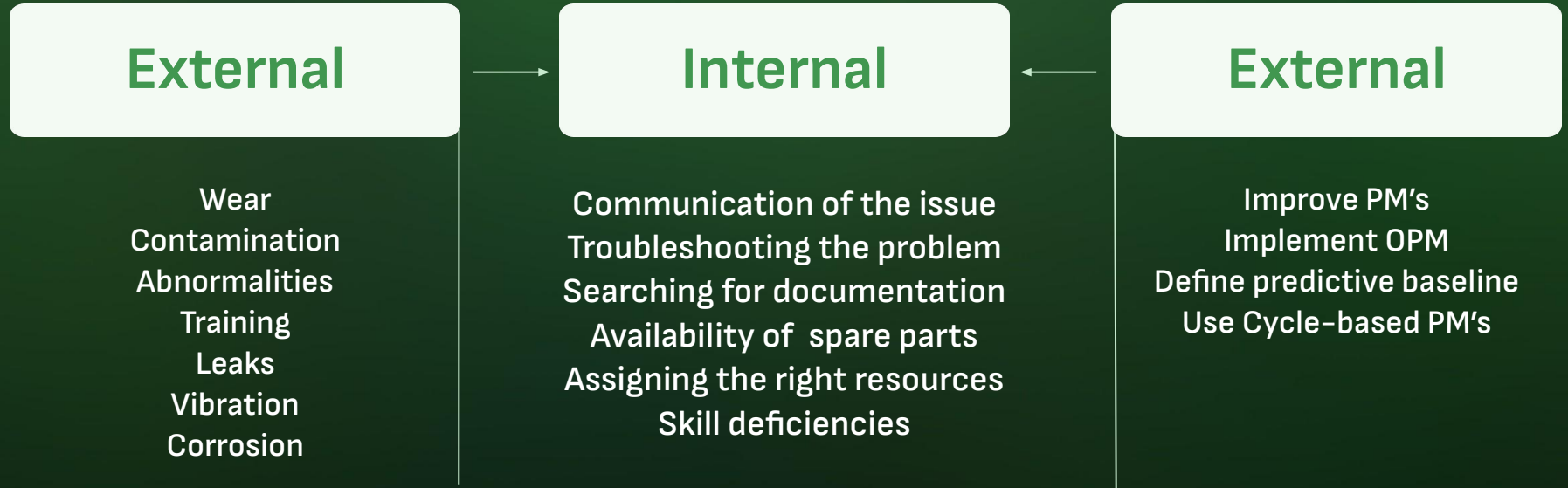
Defective Materials
Inadequate Quality Control
Rework & Scrap
Insufficient Root Cause Analysis

L2L research on downtime

Statement	Agree	Disagree
My facility does not have a consistent system in place for tracking the causes of downtime	40%	60%
My organization takes a reactive approach to maintenance (ie problems are fixed, not prevented)	67%	33%
On a weekly basis, downtime feels more like a “when” than an “if”	55%	45%
Delays in spotting or reporting an issue create a chain reaction that slows everything down	74%	26%



The anatomy of downtime



Your manufacturing operations

Training & Skills mgmt

Manage knowledge and skills of frontline teams

→ Digital tools for interactive learning, skill tracking and certification management to effectively manage skilled workers

Safety & Risk mgmt

Ensure compliance and proactive risk mitigation

→ Embed safety practices including digital safety checklists, audits and incident reporting to ensure compliance and proactive risk mitigation

Quality mgmt

Strategies to uphold product excellence

→ Implementing robust inspection, defect prevention and root cause analysis strategies to uphold product excellence

Continuous improvement

Improve to achieve operational excellence

→ Identify and eliminate inefficiencies and waste in the manufacturing process

Standard work

Ensure accessibility and consistency

→ Visually digitize and centralize standardized work instructions to ensure accessibility and consistency at point of work

Asset & Reliability mgmt

Extend asset life and improve performance

→ Schedule preventive maintenance, predictive maintenance to extend asset life and maximize spare parts

Production execution

Efficient and timely manufacturing

→ Coordinate planning, scheduling and real-time production tracking to ensure efficient and timely manufacturing

Connected Worker (CFW)

Maintenance (CMMS)

Production (MES)

Manufacturing Intelligence

Artificial Intelligence

Leverage AI to analyze data, predict issues and provide immediate recommendations to drive continuous improvement

Automation Intelligence

Leverage rules-based automations to standardize work processes and optimize workflows

Analytics Intelligence

Collect real-time data and KPIs from shop floor to generate critical insights and enable data-driven actions

Case study: Astemo



**Eliminated manual
paperwork**



**Boosted operational visibility
& machine reliability**



**Empowered
frontline workers**



Learn more

Improve access to data



Connect People and Information

Present the digital documents to the worker when and where they are needed.



Reduce Troubleshooting Downtime

AI tools to suggest downtime Fixes based on historical data



Access Historical Data at a Single Touch

Historical machine and process data available immediately on downtime occurrence



Launch Real-time Notifications

Notification protocols launched immediately when a downtime event occurs



Display Data Visually

Open access to data displayed on dashboard across the facility

Astemo results

Improved Operations

Most Successful 12 Months
in 23 Years

Data visibility ↑

Increased and enhanced
data visibility across all
plant operations

Empowered workforce

Positive cultural change with
increased employee safety,
engagement, upskilling, and
training.

Communication ↑

Simplified communication
across the shop floor with L2L's
user-friendly technology

Reliability ↑

Proactive and predictive
maintenance capabilities have

Profitability ↑

By streamlining operations,
profitability has increased and
continuous improvement has
progressed

Digital maintenance strategy roadmap



Understand current downtime drivers

Use the input of the entire shop floor to identify downtime disruption.



Integrate "where" needed

Integrate in small steps. Blanket integration is wasteful and cumbersome



Take action on downtime

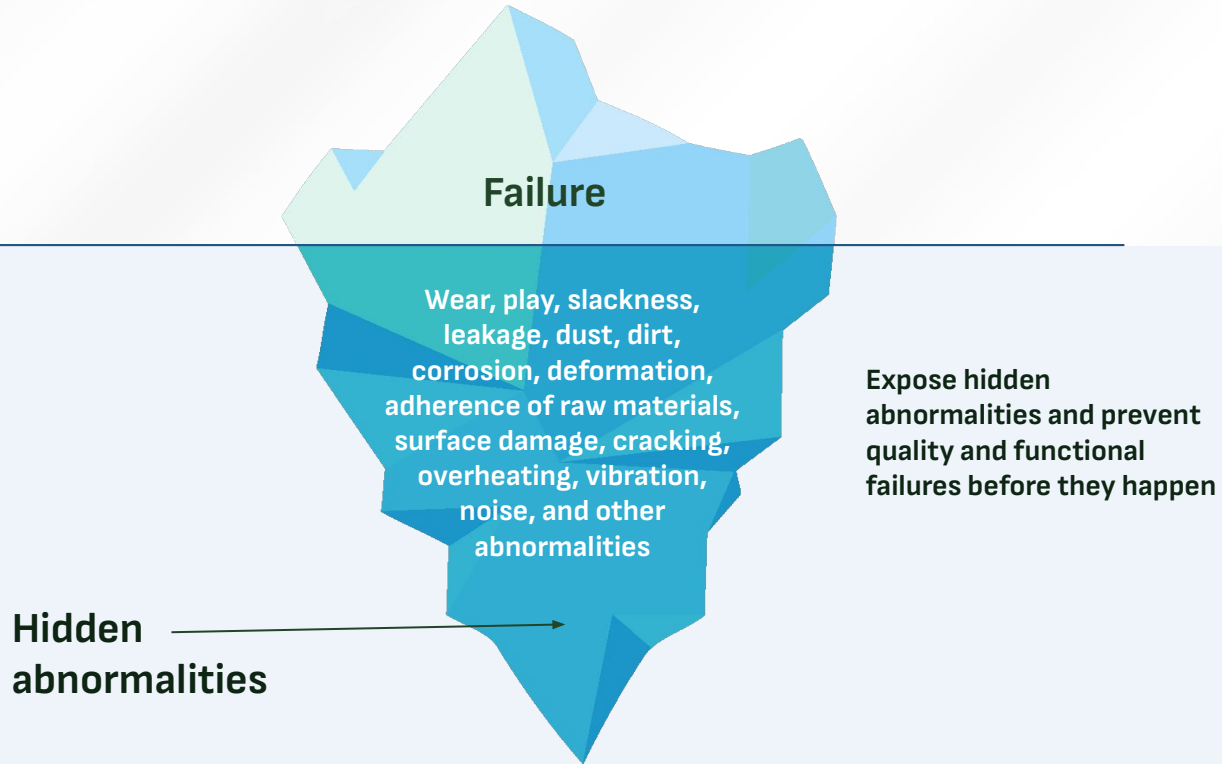
Concentrate on those issue that extend downtime incidents, then apply to all maintenance functions.



Digitize workflows

Put repeatable, simple digital workflows in place that guide the worker to the correct and most efficient outcome.

The zero-failure principle



Beyond Breakdowns: The Real Impact of Downtime

→ **607 total respondents from 46 states**

- Average 30 hours of downtime/month (17 of those are unplanned!)
- 60% lose \$250K+ annually
- 93% are taking action, but only 46% see results

... how do you compare?



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Thank you!
Don't forget to visit us at booth 23

Book a demo of L2L



Questions? My email: eric.whitley@l2l.com