



2025 Productivity Benchmark Report Sixth Biennial Edition

**Productivity Results from 1,500 Manufacturers
90 Days After Adopting the Redzone Connected Workforce Solution**

Contents

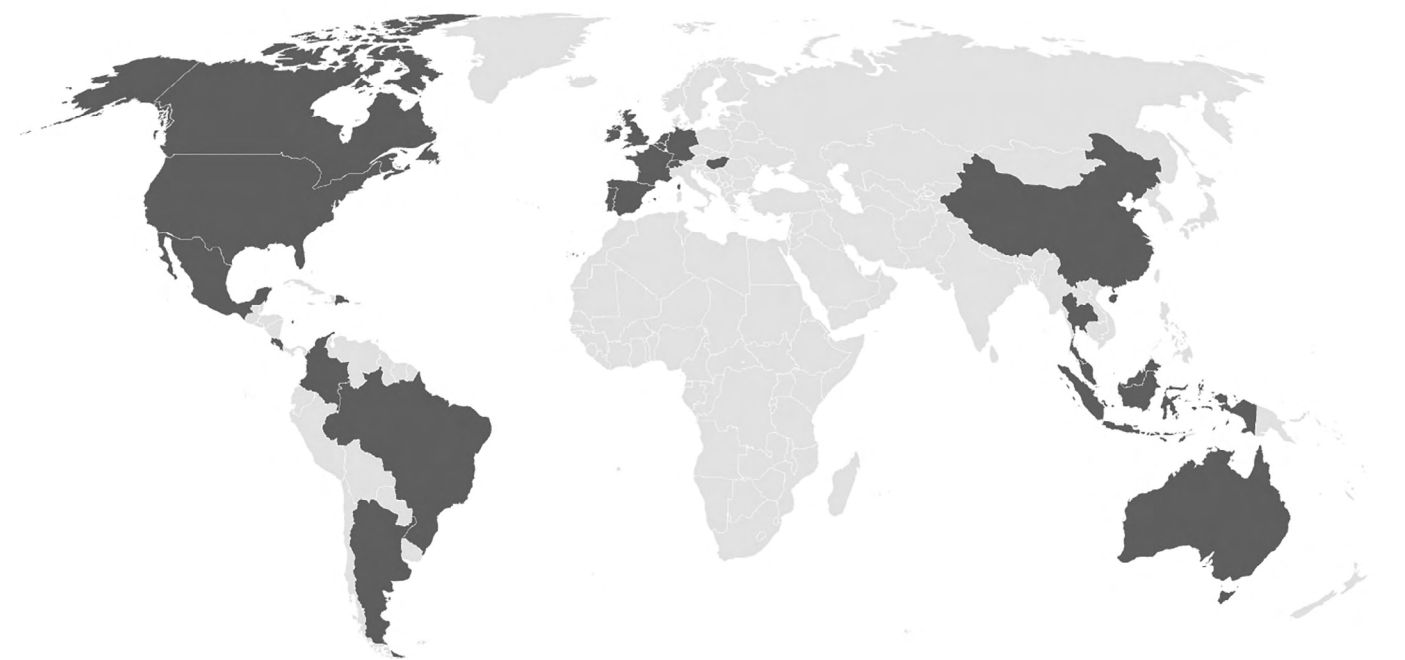
01 EXECUTIVE INTRODUCTION	
1.1 Background and Introduction	4
1.1.1 Study Scope	4
1.1.2 How Factories That Use Redzone Are Benchmarked	4
1.2 Summarized Results	5
1.3 The Objective of Continuous Improvement (CI)	5
1.4 CI Culture on the Factory Floor	6
1.4.1 How Redzone Transforms Factory Production Processes	6
1.5 Understanding CI Programs' High Failure Rates	6
1.6 Why Teams Using Redzone Avoid These Failure Rates	7
1.7 The Benefits of a Comprehensive and Mature CI Culture	8
1.8 Use This Data to Plan Your Own CI Program	9
02 REPORT BACKGROUND	
2.1 Redzone History and Growth	10
2.2 The Redzone Community	10
2.3 Scope of This Study	11
03 BENCHMARK REPORT CRITERIA	
3.1 Continuous Improvement Program	12
3.2 Baseline OEE	13
3.3 Variance Between Manually Reported and Actual OEE	14
3.4 OEE Uplift and Productivity Increase	15
3.4.1 Measuring Sustainability	15
3.4.2 Measuring Financial Impact	15
04 BENCHMARK RESULTS	
4.1 OEE Uplift and Productivity Increase	16
4.2 Baseline Data – OEE Starting Points	16
4.3 Continuous Improvement Maturity	17
4.3.1 Results at 90 Days by Industry and Factory Size	20
4.3.2 Global Deployment Results at 90 Days	22
4.4 Sustainable Change	23
4.5 Annualized Savings	24
4.5.1 Application of Savings	24
4.5.2 Additional Savings Through Kaizen Events	24
4.6 Cultural Transformation	25
4.6.1 The Flywheel Effect and Change That Lasts	25
05 WHAT THE MOST SUCCESSFUL FACTORIES DO DIFFERENTLY	
5.1 Leadership Engagement in CI	26
5.1.1 Leadership Team Participation	26
5.1.2 Rigorous Review	27
5.1.3 Forum Discipline	27
5.1.4 Communicate the Obsession	27
5.1.5 Factory-wide Communications, Recognition, and Celebration	27
5.2 Refining the Impact of Redzone	27
06 BEYOND THE PRODUCTIVITY MODULE	
6.1 Continuous Improvement	28
6.1.1 Compliance	28
6.1.2 Reliability	28
6.1.3 Learning	28
6.2 Observed Uplifts by Module	28
6.3 Product Development History	29
6.4 What's Coming Next from Redzone	29
6.4.1 Cross-site Collaboration	30
6.4.2 Champion AI	30
6.4.3 Advanced Integrations	30
07 CONCLUSION	31
08 APPENDIX	
8.1 Overall Equipment Effectiveness (OEE)	32
8.1.1 Additional KPIs in Redzone	32
8.2 Process Segment Descriptions	33
8.3 What Does a Redzone Connected Workforce Solution Deployment Look Like?	33
8.3.1 Rapid Time to Value	33
8.3.2 Redzone Deployments: 3 Pillars for Success	34
8.4 Matrix of Early Stage and Mature CI Culture Attributes	35
Fig 1: Cumulative OEE Uplift by Focused 90-Day Program.....	8
Fig 2: Number of Factories Using Redzone by Year, 2013 – 2024.....	10
Fig 3: Factory CI Maturity Assessment Example.....	12
Fig 4: Average Points of OEE Uplift After 90-Day Deployment, by Baseline OEE	13
Fig 5: Variance Between Customer-Estimated OEE and Actual Baseline OEE	14
Fig 6: Distribution of Baseline OEE Across All Redzone Customers	16
Fig 7: Average Productivity Increase Percent by Baseline OEE	17
Fig 8: Distribution of Baseline OEE for Customers with Early Stage CI Programs	17
Fig 9: Distribution of Baseline OEE for Customers with Mature CI Programs.....	18
Fig 10: Distribution of Redzone Customers by Starting OEE, CI Maturity and Factory Revenue.....	18
Fig 11: Distribution of Baseline OEE by Industry.....	20
Fig 12: Distribution of Baseline OEE by Factory Revenue	21
Fig 13: Distribution of Baseline OEE by Global Region	22
Fig 14: Average OEE Uplift by Week Over Year One Using Redzone	23
Fig 15: Average OEE Uplift Over the First 1,000 Days Using Redzone	23
Fig 16: Top 20% of Performers After a 90-Day Redzone Deployment.....	26
Fig 17: OEE Uplift by 90-Day Redzone Module Deployed.....	28
Fig 18: Factories in the Redzone Community by Enterprise Network Size.....	30

1.1 Background and Introduction

Twelve years ago, Redzone introduced a new approach to improving efficiencies on the factory floor, the Redzone Connected Workforce Solution. In this approach, the focus is on engaging and connecting the entire manufacturing workforce to improve daily outcomes in production, quality and maintenance, with real-time data, artificial intelligence, and a collaboration platform enhancing their efforts and choices. This sixth biennial benchmark report analyzes the impact of that approach on the productivity of factories using the Redzone Solution.

1.1.1 Study Scope

This sixth biennial benchmark report encompasses the largest data set of manufacturers of any study of its kind to date. This study includes data from **1,500 factories**. These 1,500 factories generated more than **50,000,000 production runs** and encompassed **491,000 daily Redzone users**. Additionally, factories from a wide range of industries in **25 countries and 5 continents** are represented in this report.



1.1.2 How Factories That Use Redzone Are Benchmarked

This benchmark report studied the productivity results reported by large and small manufacturing teams around the world and across industries that had completed the 90-day Redzone coaching program. These results were measured in the change in factories’ Overall Equipment Effectiveness (OEE) between start and completion of the Redzone program. The Redzone solution measures and presents many production metrics that provide insight into factories’ manufacturing processes. OEE is the primary metric studied in this benchmark as it standardizes data across industries and processes. The standardized 90-day Redzone coaching program, with automated data collection and supportive AI, provides a results set reported in a consistent manner that can be analyzed and benchmarked. This provides clear insight into productivity measurements before and after the Redzone program has been implemented in factories. Additionally, demographic information from the 1,500 factories provides more granular context for productivity measurements before and after Redzone deployments.

1.2 Summarized Results

An average 26.4% increase in productivity* was observed across the 1,500 factories in this study. The average starting OEE was 47.4%. The average uplift in OEE was 12.5 points resulting in 59.9% OEE at the end of the 90-day Redzone program.

26.4% Average Productivity Increase in 90 days
Productivity increase calculation:
12.5pts OEE uplift / 47.4% baseline OEE = 26.4% productivity increase

The Redzone biennial benchmark report is the most comprehensive study of its kind. Every factory in the Redzone Community that deployed the 90-day coaching program is included in this report. This study includes the results of factories in all major manufacturing verticals and continuous, high-speed, and discrete manufacturing processes. OEE is just one of the measures of a factory’s performance tracked within Redzone. Units per hour (UPH), units per labor hour (UPLH), cycle time, takt time, and product giveaway are examples of other key performance indicators (KPIs) tracked in Redzone. Other metrics are often relevant to specific processes or industries. OEE is a universally applicable measure and part of every Redzone factory’s data set. OEE provides meaningful insight in a diverse data set and is the primary metric in this benchmark report.

1.3 The Objective of Continuous Improvement (CI)

Scientific data are not taken for museum purposes; they are taken as a basis for doing something. If nothing is to be done with the data, then there is no use in collecting any. – W. Edwards Deming¹

Manufacturers are deeply committed to CI and are eager to increase value by optimizing processes. Collectively, manufacturers spend billions of dollars on technology, consulting, and training to streamline production and supply chain processes. Factories use Six Sigma initiatives to reduce product variations, Total Quality Management to improve processes, Lean manufacturing to enable just-in-time production that reduces waste, 5S to organize and clean workspaces, and Kaizen to enable targeted problem solving for top losses. The goal is always to produce a seamless process across Operations, Quality, and Maintenance. These disciplines are highly effective towards that end, but traditionally implementing them was labor-intense, manual, and required years of focused effort to unlock all the opportunities within the factory walls. Digital solutions for CI like Redzone give the frontline teams the ability to visualize, centralize, and most importantly prioritize daily activities and problem-solving actions. Real-time dashboards that reflect the impact of interruptions as they occur make it easier to review progress and overcome obstacles before they harm production. Companies that are best-in-class at quality production and CI include Toyota, Nestlé, Procter & Gamble, and others. They have strong brand reputations for quality and consistency, are considered best-in-class in their industry, and see higher margins and share prices than their peers. Working in a lean, nimble manner is mission-critical within the factory walls and is key to survival in the current global manufacturing conditions: supply chain delays; rising costs for raw materials, talent, and logistics; shifting workforce demographics. Digital tools like Redzone quantify the barriers to manufacturing success in real time. Redzone goes beyond digital dashboards, using this data to help factory teams to redefine what is controllable each day. By leveraging the efforts of an engaged and connected workforce, the full set of manufacturing opportunities in each minute of each shift is maximized. When controllable opportunities within the walls of the factory are maximized, the impact of uncontrollable forces beyond the factory walls, such as the global economy, are minimized.

Study Scope and Summary of Results

1,500
factories globally*

491K
frontline workers

50M
production runs

12 points
Average overall equipment effectiveness (OEE) uplifts

26%
Average productivity gain

3-6 Months
Average ROI**

*All factories are assessed within 90 days of implementing the solution and periodically thereafter.
**Varies based on baseline OEE and level of CI maturity.

1.4 CI Culture on the Factory Floor

It's fair to say that all factories wish to manage their data, processes, and employees' actions to improve their outcomes. Most factories have at least some systems in place as guidance for their workforce and processes.

Redzone coaches evaluate factories at the beginning of their deployments. Factories fall along a CI maturity spectrum from Early Stage to Comprehensive and Mature. An impartial evaluation of a factory's CI culture at the start of the 90-day program creates an understanding of what each factory's specific opportunities are.

CI Maturity ratings are based on depth of integration of the following:

- Visual Factory with KPI Tracking
- Daily CI Routines and Coaching
- Kaizen Cadence and Daily Problem Solving
- Results and Recognition by Peers and Leaders
- Team Collaboration and Alignment with Company Goals

1.4.1 How Redzone Transforms Factory Production Processes

Participants follow the same 90-day Redzone coaching program to accomplish five measurable CI journey goals:

1. Create a visual factory, which includes production efficiency measurements that are visible to all workers, factory-wide, and in real time.
2. Coach operators, supervisors, and factory leaders in basic CI tools, effective short-interval-control, and collaborative problem-solving skills.
3. Improve OEE by at least eight points by the end of day 90.
4. Establish baseline OEE, track OEE gains, and document cost savings as verified by factory finance teams.
5. Sustain all gains made in the first 90 days and improve on them in the months and years to come.

1.5 Understanding CI Programs' High Failure Rates

Manufacturers spend time, effort, and money seeking to improve processes to reduce their cost, sell more goods, and increase their market competitiveness. ASQ, the American Society for Quality, estimates unnecessary waste due to quality issues can cost companies up to 25% of annual sales.² CI programs can unlock significant savings and new revenue, from driving equipment uptime and production throughput, to improving product quality and reducing returns. These cost savings can then be funneled into new CapEx and OpEx initiatives.

Unfortunately, despite high expectations and significant investments, between 70% and 95% of both CI and digital transformation initiatives fail.³ Companies often notch initial gains, only to see programs fail months later. The reasons vary: “This is way too hard to try to use in our regular jobs,” “The Consultants left and took our accountability with them” “They were never really our goals, they were management’s goals.”

If you've attempted a CI or digital transition in the past, this likely resonates with you. Unrealistic goals or goals poorly supported by processes are not sustainable. Workers may feel programs are pushed on them, and they have no choice or voice in how they are implemented. There are dozens of CI tools in the Lean toolbox and attempts to launch all at once are daunting and labor intensive. As a result, teams may resist long-term change. Business stakeholders then lose interest and results slip over time. Leaders then redirect CI funding to other corporate priorities and the initiative ends.

1.6 Why Teams Using Redzone Avoid These Failure Rates

Redzone enables successful digital CI transitions by making CI and Lean concepts approachable and integrating them into existing workflows. Intuitive dashboards track progress in real time, while a mobile collaboration platform empowers frontline workers to manage change. Automated data capture, IIoT devices, and real-time SPC reduce administrative tasks. Redzone's coaching model enhances learning by teaching leaders motivational techniques to unlock frontline creativity and drive. And the data and insights collected through human contribution and automated data collection are refined by Redzone's artificial intelligence, Champion AI, to provide meaningful, real-time predictive insights to the factory floor.

Aligning and sharing goals:

Redzone provides an easy way to share corporate, department, and individual goals with workers and measure alignment and level of participation. Data, resources, and messages are stored on the platform, enabling workers to consult them frequently.

Addressing frontline workers motivations:

Redzone understands that engaging frontline workers is crucial for sustained factory success, with ‘reducing daily frustration’ as a key motivator. The platform empowers workers to share ideas for improving daily tasks and provides digital tools, including work instructions and SOPs, to clarify expectations and support success. Redzone also fosters professional growth through process mastery, manager feedback, and recognition. To enhance continuous improvement (CI) efforts, Redzone promotes ongoing peer-to-peer and leadership recognition and hosts an annual awards event to celebrate factory team achievements.

Providing seamless processes:

The Redzone Connected Workforce Solution provides embedded CI methodologies like tools to do daily work across functions, real-time data, analytics for reporting, and short-interval-control to share best practices. Existing work is enriched by embedded tools for every level and function in a single interface.

Equipping workers with ever-present technology:

Redzone develops tools using existing and emerging technology to improve human processes. Recording videos of processes, subtitles, and integrated translation are examples of this. With Champion AI, Redzone is leading the industry in navigating how AI strengthens and complements teams and decisions.

Meaningful data for different audiences:

Dashboards are simple and quickly provide understanding of progress to targets, non-conforming events, and chats. These views are visual, vivid and approachable; shape and color provide immediate understanding for operators and leaders alike. Self-generating in-app reporting provides a deeper layer of detail for frontline supervisors. Production data is simultaneously saved to a database for in depth analysis and problem-solving.

Digital training at the point of use:

Digital technology ends reliance on hard-to-apply classroom training and brings learning into the real world. Frontline workers use the Redzone app on ruggedized mobile devices. App workflows are simple. Workers easily access OJT materials and interactive SOPs needed to perform their jobs. Operators suggest improvements directly from their devices. When processes are updated, these are reflected in documentation to the floor in real time.

Onboarding and development:

Redzone provides clear dashboards intended to be understood at a glance. This gives every new employee a visual understanding of, and a way to contribute to, factory goals on Day 1 of their employment. With SOPs at the point of use and collaboration tools like Chats and Line Logs, the Redzone onboarding experience creates knowledge, awareness, and connection from Day 1 of an employee's tenure. Advanced in-app onboarding features such as dynamic skills matrices allow employees and their managers to collaboratively develop employees from their first week to their retirement.

² 'Cost Of Quality: Finance For Continuous Improvement,' ASQ, webpage, undated, <https://asq.org/training/cost-of-quality---finance-for-continuous-improvement-qpc>

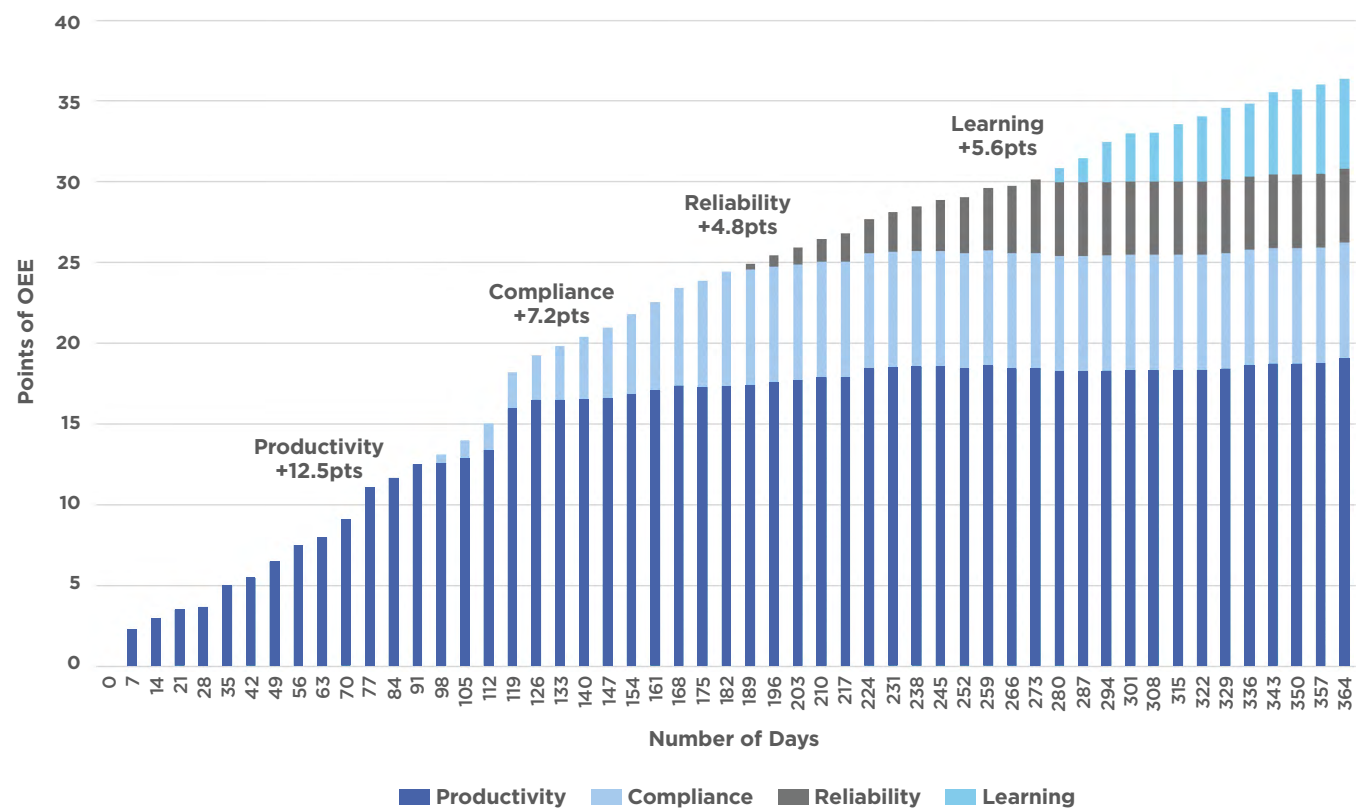
³ Dr. Corrie Block, PhD, DBA, '12 Reasons Your Digital Transformation Will Fail,' Forbes, March 16, 2022,

1.7 The Benefits of a Comprehensive and Mature CI Culture

A ‘comprehensive and mature CI program’ is one that has aligned company processes and goals across all functional roles and levels of responsibility. Each successive factory team whose work is simplified and aligned to the bigger picture brings additional opportunities for collaboration, simplification, and process improvement. This leads to realization of even greater efficiency and financial savings.

The value of each functional team understanding and participating in the CI initiatives and factory goals is very evident in the observed uplifts from deploying the four different Redzone modules. With the addition of each module, another core team and set of functions is centralized in Redzone. Correspondingly, with the deployment of each Redzone module, additional productivity increases are observed.

Fig. 1: Cumulative OEE Uplift by Focused 90-Day Program



1.8 Use This Data to Plan Your Own CI Program

Reading this report means that you are searching for answers to improve the processes, profitability, or engagement in your factory. This is the drive for Continuous Improvement and seeking a solution is the first step in becoming a world-class manufacturing organization.

What your CI deployment should look like:

- All team members – leadership, management, and frontline workers – are aligned and engaged to achieve important business outcomes.
- CI goals are aligned with corporate initiatives and provide significant and measurable financial results. These results are quantified and verified. Enterprises benefit from these savings with a return to the bottom line within 90 days of the program start.
- In addition to lowering labor costs per unit, first-pass quality is increased and defects are reduced.
- Processes are streamlined and scalable to support growth, whether in a single factory or across a network of sites.
- Easily implemented with rapid time to value, regardless of the size of your facility.

This report analyzes results from 1,500 factories and countless teams who are working with purpose and *Winning the Day*. You will learn how they are using Redzone to achieve an average productivity increase of +26% in just 90 days and simultaneously generate worker enthusiasm and motivation to sustain change for the long-term. Imagine what your factory and workforce could accomplish with Redzone. Imagine a reality where your teams achieve greater machine uptime and productivity to unlock capacity with your existing infrastructure, resulting in improved product quality and throughput while creating a culture transformation on the factory floor.

We hope you will be inspired by your peers’ success with Redzone and use these findings to advocate for change at your factory today. Continue reading to learn more about how Redzone’s Connected Workforce Solution has helped factories just like yours, achieve an average 26% productivity increase in just 90 days.

Ken Fisher

Senior Vice President Product – Redzone

Learn more about the Redzone Connected Workforce Solution at rzsoftware.com

02 REPORT BACKGROUND

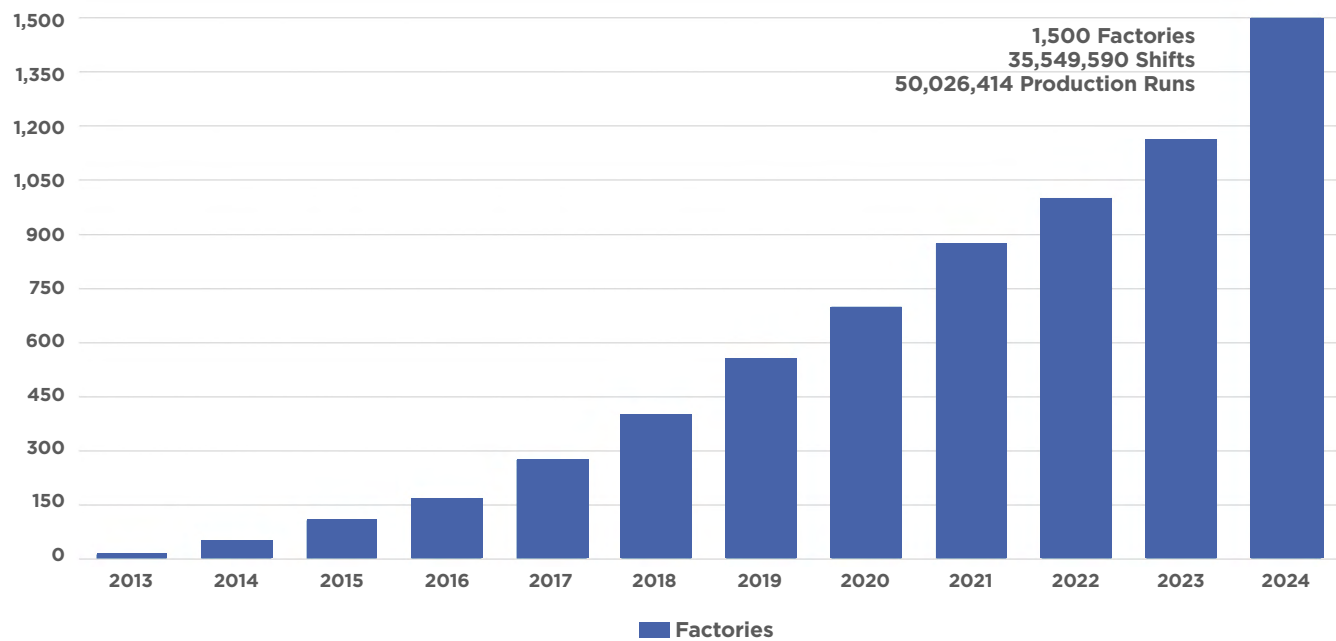
2.1 Redzone History and Growth

Redzone began benchmarking factories in 2014, a year after launching the Redzone Connected Workforce Solution. This biennial survey report includes all 1,500 factories that have deployed Redzone to date.

Every factory benchmarked in this report has completed Redzone's standardized deployment program, which includes creating a visual factory, coaching in continuous improvement routines, having real-time production efficiency data, and connecting the workforce.

The Redzone customer data set includes wide-ranging manufacturing processes, industries, global regions and factory size. This provides specific insight into the performance of manufacturers and what frontline teams can achieve together when they adopt Redzone, in any industry, process, or factory size.

Fig. 2: Number of Factories Using Redzone by Year, 2013 – 2024



2.2 The Redzone Community

Redzone refers to its customers as community members. Frontline teams and leaders use the community to share ideas, best practices, and lessons learned. Redzone hosted forums and events facilitate conversations between organizations. Community members in this report refers to the Redzone customer base.

Redzone community members span diverse industries, processes, and locations. This report includes a range of factories—from complex, multi-stage manufacturers to automated bottlers and manual custom packing facilities. With varying baseline efficiency levels, CI maturity, and factory sizes, across 25 countries and 5 continents, the evidence is clear: adopting the Redzone program consistently drives positive outcomes through CI methodologies, connection-supporting software, and goal alignment.

2.3 Scope of This Study

The Redzone benchmark report is the most comprehensive of its kind in manufacturing. The Redzone community has grown 125X in 12 years, from 12 to 1,500 factories. The 1,500 factories in this study logged data from 41,859 production lines, 35,549,590 shifts, 50,026,414 production runs.

This biennial report provides an industry benchmark for current and prospective customers, analysts, the media, and others to evaluate the impact of adopting Redzone. As a cloud platform, Redzone collects accurate production data from lines and frontline teams, supporting business cases and metrics. Using various methodologies to improve OEE and productivity, Redzone continuously enhances its Connected Workforce Solution, enabling frontline teams to sustain and expand their gains across workstreams.



03 BENCHMARK REPORT CRITERIA

This study benchmarked the aggregated data from all 90-day Redzone deployments.

Additionally, data was further analyzed per the dimensions below to provide deeper understanding of documented productivity increase.

- **CI Maturity and Baseline Production Efficiency:** how 90-day uplifts vary based on CI rating (as assessed by a qualified CI coach at the beginning of the deployment) and Baseline production efficiency (initial true calculated OEE on deployment focus lines)
- **Reporting Variance:** observed variance between factories’ manually reported OEEs and true calculated OEE
- **OEE Analysis by Factory Demographics:** trends in productivity increase across factory characteristics such as global region, industry, and factory revenue
- **Financial Impacts:** what are the savings generated by 90-day deployments (as provided by Redzone customers)
- **Sustainability:** what happens to factories’ uplifts after the initial 90-day deployment

3.1 Continuous Improvement Program

A factory’s CI maturity rating is based on an audit score between 1-10.

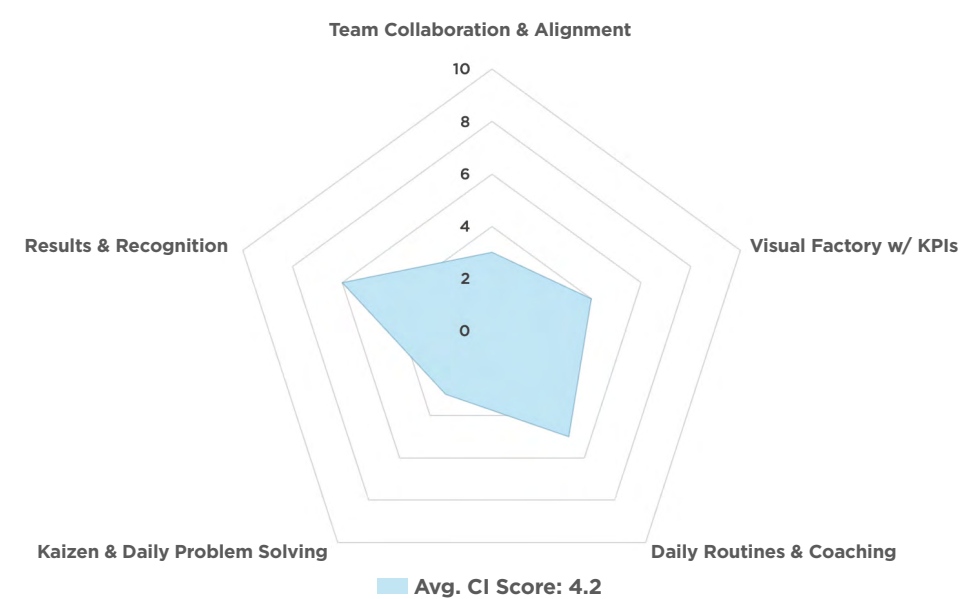
1 – 5 pts: Early Stage – Indicates managers are laying the foundation of CI for frontline teams at their factory.

6 – 10 pts: Comprehensive and Mature – Indicates factory leaders and frontline teams actively participate in a shared CI program.

Like baseline metrics, community members’ CI maturity is audited by a Redzone-certified coach before beginning their 90-day program. Coaches use a scale of 1-10, with 10 signifying a factory that demonstrates a comprehensive and advanced CI culture.

Coaches use five criteria to develop scores, as demonstrated by Fig. 3 below. By measuring CI maturity, results of factories early in their CI journeys versus those who have integrated CI culture into the factory floor are better understood. These methodologies are clear, easily applied, and deliver results that align with community member needs and business priorities.

Fig. 3: **Factory CI Maturity Assessment Example**



Factories are split into one of two buckets based on their ratings:

1-5: Early Stage – A none to foundational CI rating: The factory leadership team might be familiar with the concepts of Lean manufacturing, Six Sigma, and other CI methodologies. However, these methodologies have not been significantly deployed throughout the organization. While the factory may have some tools in place to help frontline employees drive problem-solving and reduce waste, leaders acknowledge they need help beginning or accelerating their CI journey.

6-10: Comprehensive – A mature to advanced CI rating: Factory employees are aligned around common goals. They view CI as part of their core responsibilities and proactively collaborate across functions to optimize processes. Visual management tools are clear, obvious, and easy to use, while well-established systems drive daily work and operational cadences. All employees, from managers to frontline workers, understand and possess the common skills required to analyze root causes and solve problems, by using Kaizen, 5S, statistical process control, and other methodologies.

3.2 Baseline OEE

OEE (Overall Equipment Effectiveness) is a universally accepted method of measuring manufacturing productivity and gaining insights on how to systematically improve the whole manufacturing process.

OEE is a non-financial calculation of production rate, quality, and line availability, measuring actual output compared to the theoretical maximum (TMax) capability of a production process. OEE identifies the percentage of manufacturing time that is truly productive. In short, OEE provides immediate understanding of the total opportunities available versus the percentage of those opportunities effectively used to make good product. It’s a universal measure, applicable to any process and any facility size.

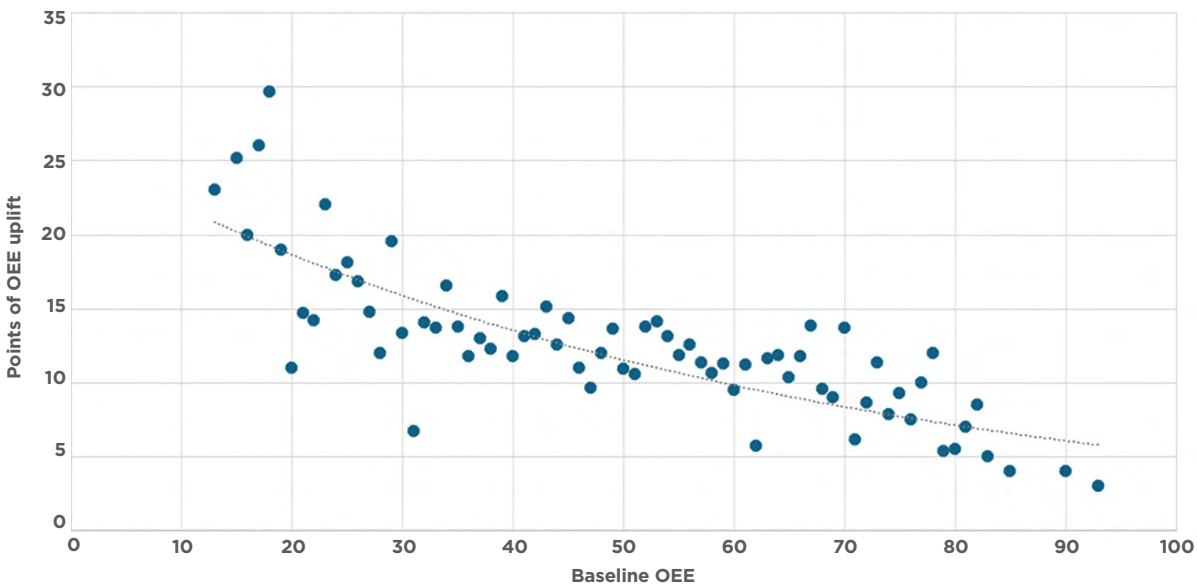
An OEE of 100% signifies a perfect shift. Only good parts are produced at 100% quality; at the maximum speed at 100% performance; without any downtime (100% availability).⁴

OEE measures efficiency against a common set of standards. For the purpose of this report, OEE is reported exactly as reported by the factories in this data set. Factories capture OEE data in several ways, most commonly using automated signals directly from input and output sensors, programmable logic controllers (PLCs), and equipment cycles.

Redzone allows some flexibility in how OEE is calculated, as long as factories adhere to best practice guidelines. The baseline OEE is always reviewed and agreed upon with factory leadership in the first 10 days of the deployment to ensure accurate measurement of improvements.

Using the factory’s baseline OEE, Redzone measures subsequent increases over a period of time, beginning with the first 90 days. The baseline number provides an industry benchmark and is compared between factories early in their improvement journey as well as more mature factories.

Fig. 4: **Average Points of OEE Uplift After 90-Day Deployment, by Baseline OEE**



12 ⁴ Please see Appendix 8.1 Overall Equipment Effectiveness (OEE) for additional information.

3.3 Variance Between Manually Reported and Actual OEE

Factories struggle to build an accurate picture of their OEE in the absence of automated and impartial data collection from their processes. OEE, in the simplest terms, is a measure of what percentage of a factory’s total available opportunities to make good product are being used effectively. This simple understanding of what is achieved vs. what is possible each day ensures strategic initiatives and capital expenditures are driven by a real understanding of what will best close the ‘opportunity gap.’ In the absence of transparent and trustworthy data, factories may be applying solutions to misunderstood opportunities and misidentified constraints.

Upon deploying Redzone, most factories discover they had estimated their baseline OEE prior to Redzone as significantly higher than it really was. For factories that calculated OEE prior to deploying Redzone, the stated OEE was 59%. The actual documented average OEE was only 47.4%. This is an overstatement of 11.6pts of OEE.

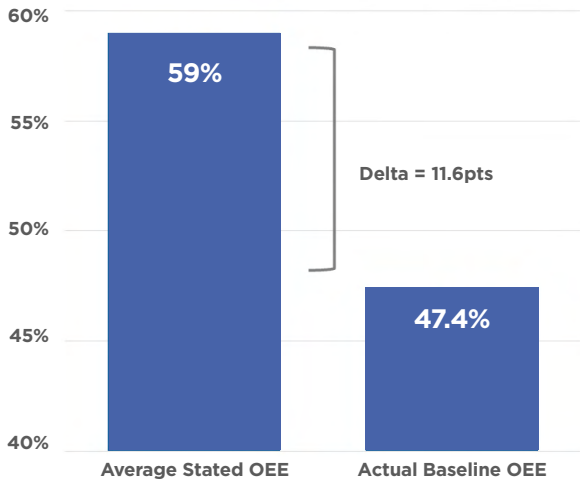
Miscalculated OEE is attributable to the difficulty in manually collecting the data points required to accurately reflect true OEE. There’s also an understandable tendency to qualify some non-productive minutes as ‘normal’ versus ‘bad’ and only count the ‘bad’ minutes against OEE (e.g., changeovers as ‘normal’ and mechanical breakdown as ‘bad’). In reality, every non-productive minute can be seen as an opportunity. Therefore, it is critical to measure baseline OEE accurately to ensure 90-day metrics around productivity gains and cost savings are accurately captured. Across deployments, the most commonly seen reasons for variances between manual and actual OEE are:

- Overallocation of planned downtime
- Understating theoretical max production rate
- Measuring from the perspective of schedule attainment
- Providing an insufficient accounting of quality losses

These error sources are related to a broader lack of process clarity. Downtime is not always captured accurately, with short stops often completely ignored in manual data collection. Likewise, periods of slow running are likely ignored in manual tracking. Maximum production rates are often set to budgetary, scheduling, or historically demonstrated rates rather than engineered rates. The effects and effort of rework, scrap, and similar losses are also hidden by accepted levels of waste or an inability to effectively capture these losses in real time.

Schedule attainment and budgetary numbers are rationalized to what is determined to be realistic in the current state of manufacturing. They are essential to assessing the factory’s profitability. However, OEE must be de-coupled from these other metrics to become actionable. OEE opens the door to what opportunities have been left on the table in the current state, even when factories are profitable and fulfilling current orders in full. Consistent objective methodology for tracking non-productive minutes eliminates the tendency to perceive events as ‘normal’ and ‘bad’ reasons to be non-productive and moves all non-productive minutes into buckets that can be understood and converted to productive minutes.

Fig. 5: Variance Between Customer-Estimated OEE and Actual Baseline OEE



3.4 OEE Uplift and Productivity Increase

OEE baseline data represents the starting point for ongoing trend data. Leaders obviously want to increase and sustain OEE to realize productivity gains, cost savings, and ROI for their investment in Redzone. This report benchmarks factories’ progress from baseline OEE to 90-day OEE. In the interim, teams complete their first 90-day coaching program for high-volume focus lines. Coaches work with factory leadership to identify focus lines for this effort. While Redzone is deployed factory-wide, coaches prioritize their time and effort on the focus lines that provide the greatest opportunity for the customer. Focus Lines are described as those lines with an outsized impact on a factory’s financial results, generally lines that contribute 80%+ of a factory’s total volume or revenue.

At the end of the 90-day program, coaches and leaders perform a detailed success assessment, analyzing key trends. Official results are signed off by factory leadership, including the finance leader. Once factory leaders have scrutinized and validated results, they hold a Town Hall meeting with the entire factory team. The goal is to share insights into what results were accomplished, how they were achieved, and who contributed to the success. The entire team celebrates results, and leaders recognize those workers who contributed most to the accomplishment.

One caution: OEE is a common measure and very effective for measuring productivity over time within a factory. However, baseline OEE is not necessarily useful for comparison between seemingly similar factories as the context of product mix, process complexity, or other confounding factors is not represented in OEE.

Productivity increase is a normalizing percentage which calculates the change in OEE, divided by the starting point for each factory.

Calculating Productivity Increase

Example of calculating the productivity increase for a 40% OEE with a 10pt uplift

Productivity Increase % = $\frac{\text{OEE Uplift (10pts)}}{\text{Baseline OEE (40\%)}}$ = 25% increase

3.4.1 Measuring Sustainability

Redzone’s goal is to empower community members to advance their CI journey and achieve ongoing OEE uplifts and productivity gains. Frontline community members often complete additional 90-day programs for Compliance, Reliability, and Learning, exponentially increasing cross-functional communication and reinforcing sustainable processes for the long-term.⁵ Redzone also measures progress after one-year and three-year periods.⁶ Companies continue driving gains because they have created unstoppable commitment to CI and a culture around driving results. With this culture, any worker can suggest process improvements, create tools to help others, and help their teams *Win the Day*.

3.4.2 Measuring Financial Impact

In this report, financial benefits are measured as cost savings, meaning a factory produces the same volume of products with fewer resources. Cost reductions are typically achieved by reducing worker overtime, running fewer or shorter shifts, using less temporary labor, and reducing variable overhead by running fewer production hours in one or more areas. For factories that are not capacity-constrained, cost savings demonstrate true financial impact. Average factory savings are calculated as reported by each factory.

Factories that are capacity-constrained boost top-line revenues by increasing production throughput while avoiding additional capital expenditures. They also improve gross margins by reducing the fixed cost of each unit and diluting it across the increased output. Factories can increase throughput by running the same number of production hours, but with higher throughput, less product loss, and less planned or unplanned downtime.

⁵ See Chapter 5: What the Most Successful Factories Do Differently for more information.
⁶ See Section 4.4 Sustainability for more information.

04 BENCHMARK RESULTS

Summarized Findings

On average, factories deploying Redzone documented: 26.4% increase in productivity with an average starting OEE of 47.4% and average ending OEE at 59.9%. The performance of every factory that completed its 90-day deployment program by YE 2024 was included in this report.

26.4% Average Productivity Increase in 90 days
12.5pts OEE uplift / 47.4% baseline OEE = 26.4% productivity increase

In real terms, the number of units produced by a factory in 5 production days before Redzone is produced in 4 days after their 90-day Redzone deployments.

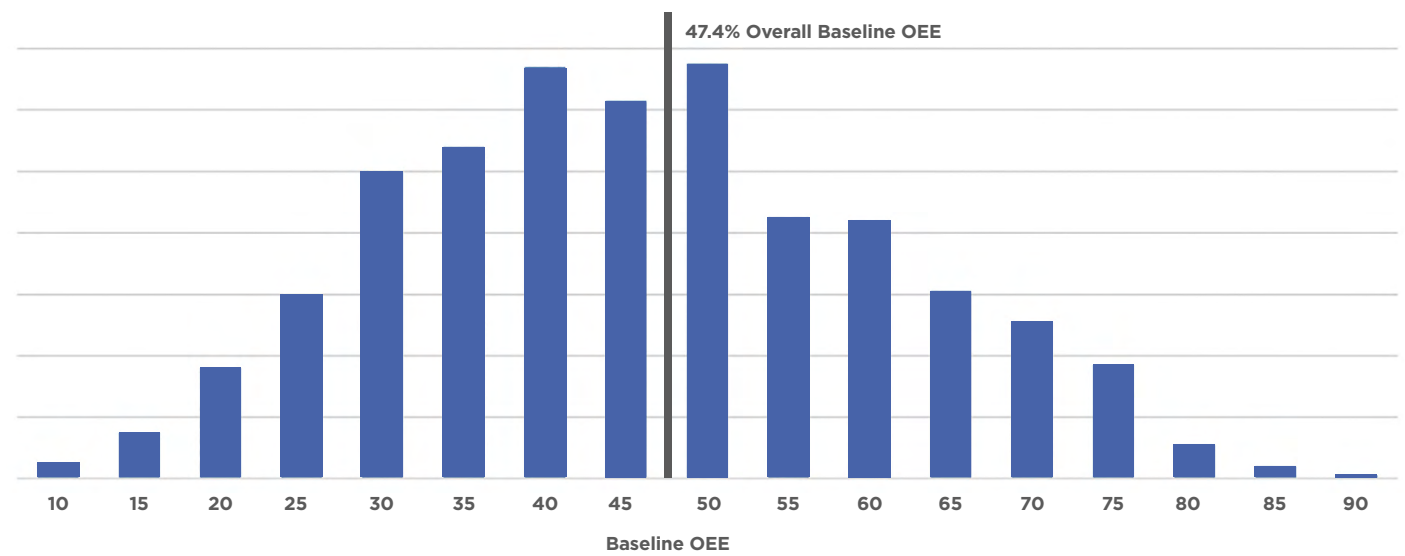
4.1 OEE Uplift and Productivity Increase

This benchmark report studied OEE uplift and productivity increase observed during 90-day deployment of the Redzone Production System. Productivity increase is calculated as the gain from the calculated baseline OEE at the start of deployment to the concluding 90-day OEE. The productivity increase results from every factory that completed its 90-day Productivity deployment by YE 2024 is included in this report.

4.2 Baseline Data – OEE Starting Points

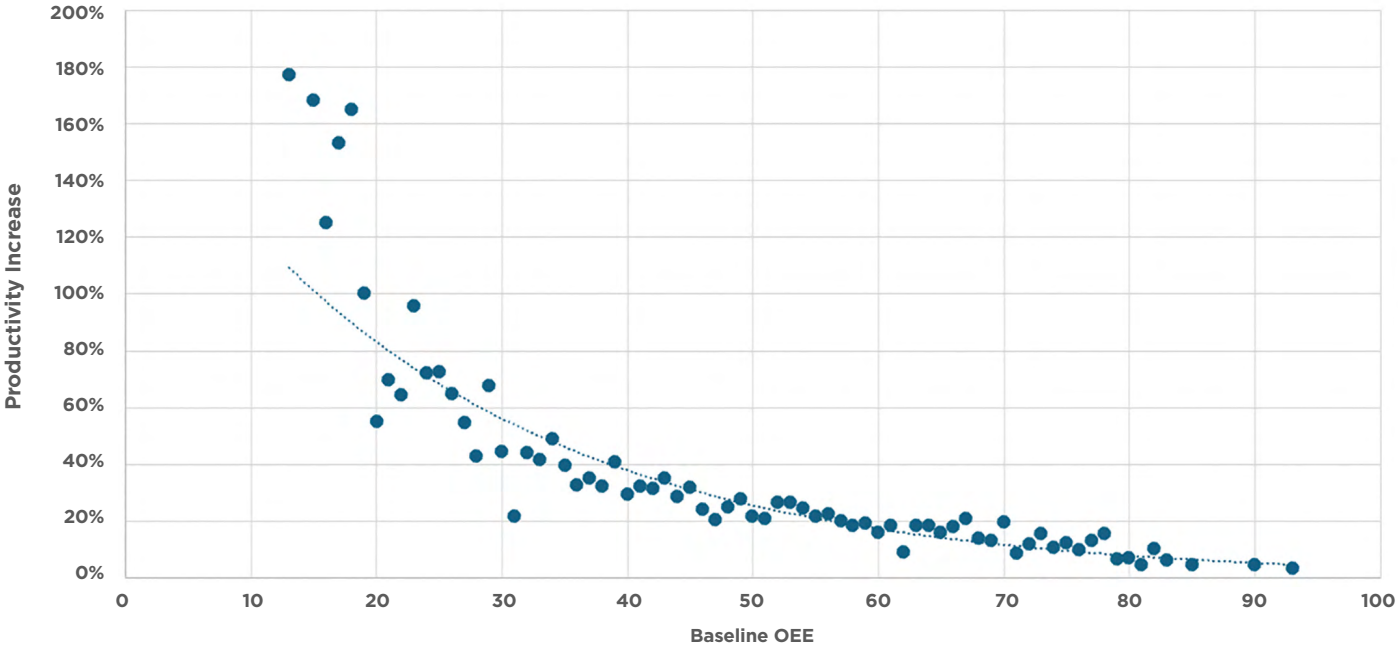
Redzone coaches observe OEE of the week leading up to launching Redzone and then again for the two weeks following. Baseline OEE is the average of these numbers. This ensures the baseline OEE is a meaningful reflection of several days and processes in a factory rather than derived from a single static observation. Baseline OEE varied dramatically across community members. The average baseline OEE was 47.4 points, and the average OEE uplift was 12.5 points. Redzone then measures 90-day OEE across the final two weeks of the program with the same methods.

Fig. 6: Distribution of Baseline OEE Across All Redzone Customers



Factories in this study had a wide range of baseline OEE. Regardless of baseline OEE, all factories that completed the Redzone 90-day program demonstrated significant productivity increase after 90 days. The factories with the lowest baseline OEE’s demonstrated the highest productivity increase.

Fig. 7: Average Productivity Increase Percent by Baseline OEE



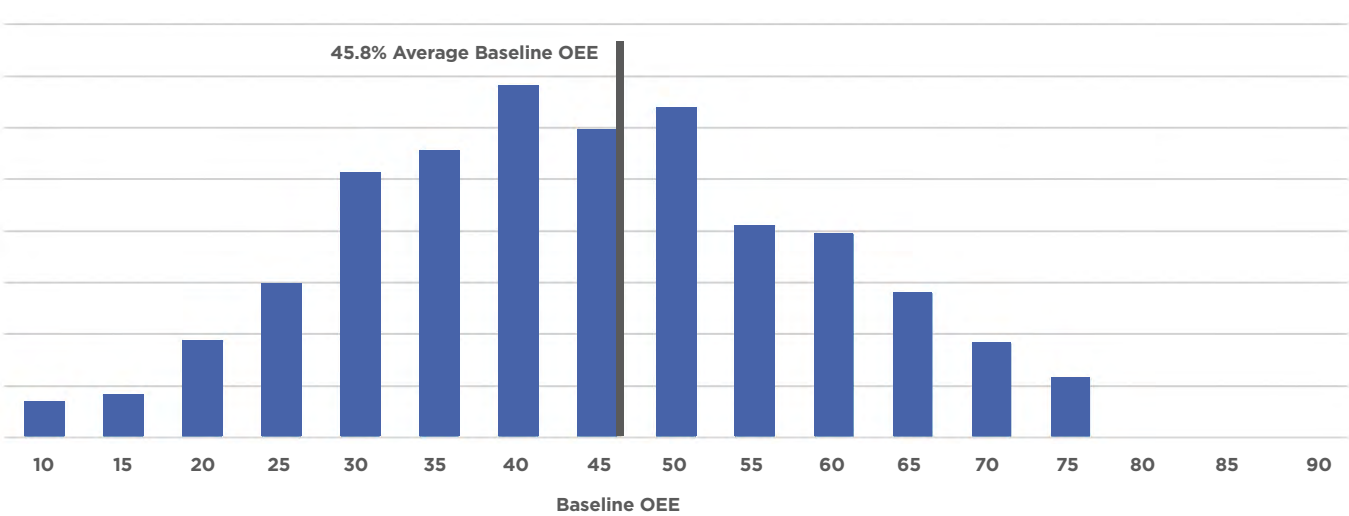
Analyzing the data set further reveals trends based on various factors within the customer base. Patterns emerge in starting OEE and productivity increase based on characteristics such as CI Maturity, factory revenue, industry, and geographic region.

4.3 Continuous Improvement Maturity

Factories launching Redzone range from those with very robust internal CI programs to those that have not even taken the first step. All factories documented an uplift during their deployment. Adding CI Maturity as a dimension reveals patterns within the overall data set. In calculating potential ROI of a Redzone deployment, mapping to the quadrant that reflects both starting OEE and CI Maturity will be most predictive.

Documenting where a company is on its CI journey at the start of a deployment identifies and provides an easy framework to refer to during deployment. Additionally, this contributes to the sustainability of the uplifts as there is a clear set of characteristics consistently exhibited by factories with a mature CI culture.

Fig. 8: Distribution of Baseline OEE for Customers with Early Stage CI Programs



04 BENCHMARK RESULTS (CONT'D)

Fig. 9: Distribution of Baseline OEE for Customers with Mature CI Programs

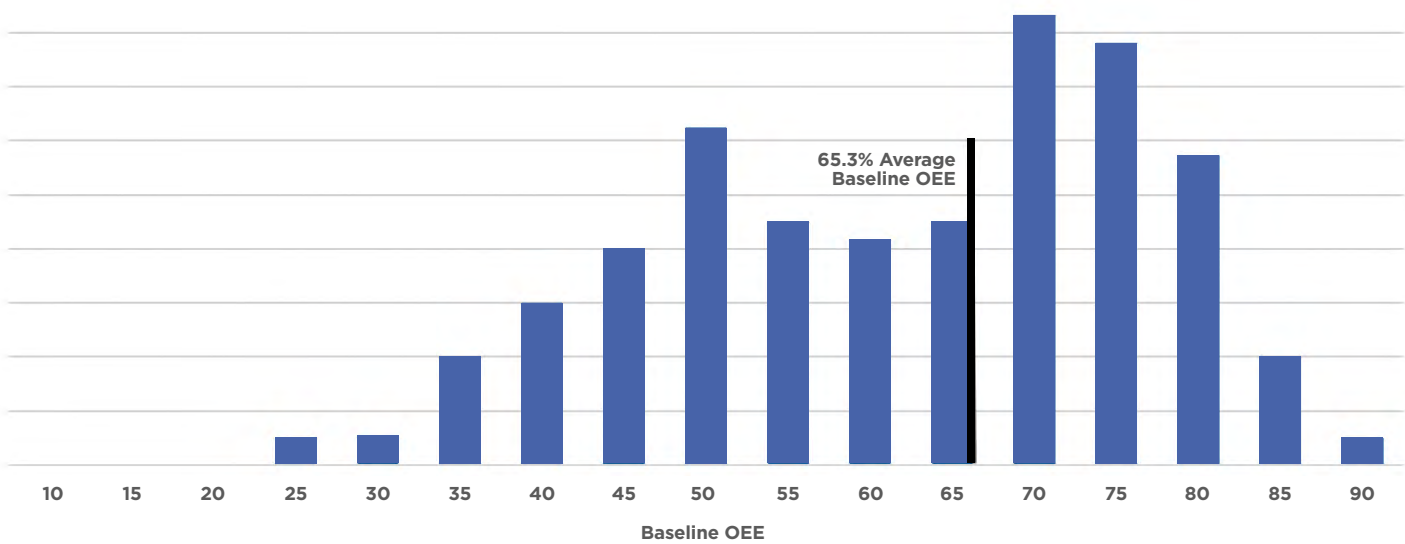
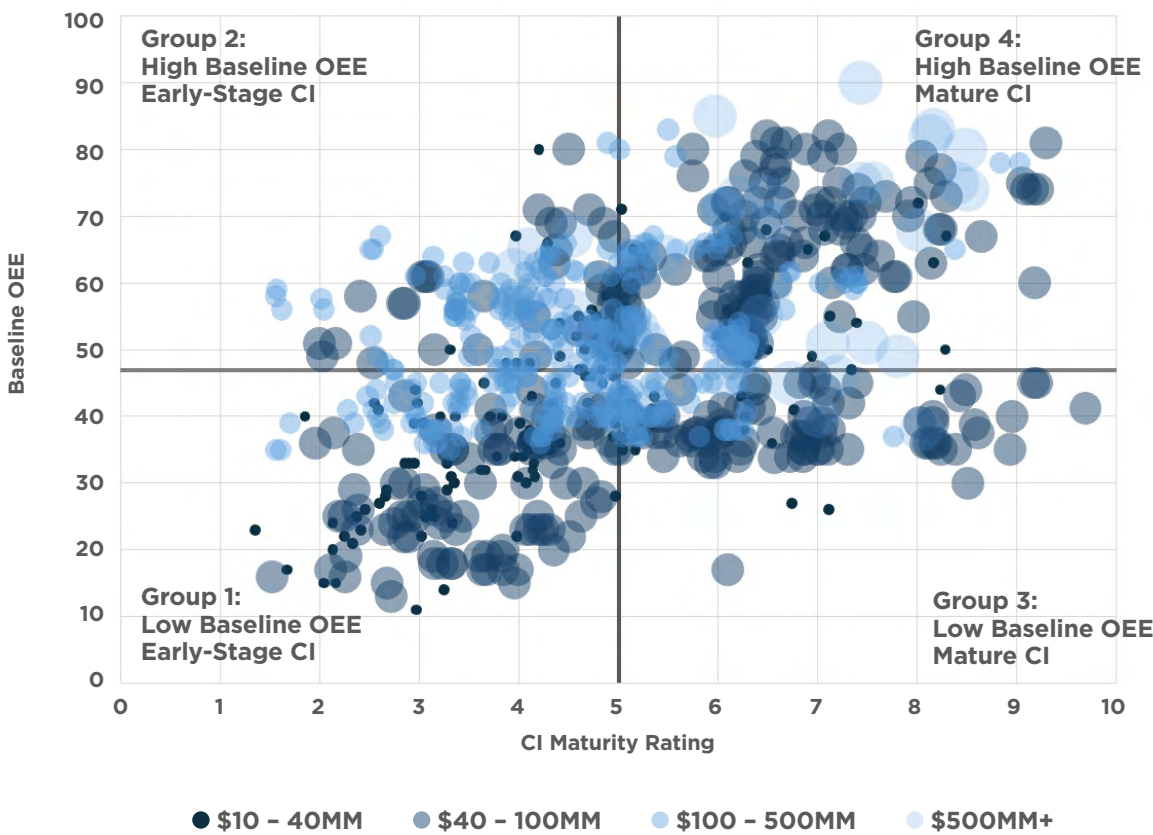


Fig. 10: Distribution of Redzone Customers by Starting OEE, CI Maturity and Factory Revenue



Low baseline CI maturity community members with low OEE starting points witness some of the greatest gains, achieving an incredible 36.4% increase in productivity (13.6pts) on average. Even the most mature factories, with higher baseline OEE and CI maturity starting points, achieve a 11.4% increase in productivity (8.3pts) on average.

Deployments of four distinct groups of customers were analyzed based on their starting OEE and their CI Maturity. This identifies predictive patterns of uplift accordingly.

Table 1: Productivity Increase by Starting CI Maturity and Baseline OEE

Group	Baseline OEE / CI Maturity	Avg. Baseline OEE	Avg. OEE Uplift (pts)	Avg. 90-Day Productivity Increase
Group 1	Low Baseline / Early-Stage CI	37.4%	13.6	36.4%
Group 2	High Baseline / Early-Stage CI	60.7%	11.5	18.9%
Group 3	Low Baseline / Mature CI	44.1%	12.4	28.2%
Group 4	High Baseline / Mature CI	72.6%	8.3	11.4%
Overall	All Factories	47.4%	12.5	26.4%

Group 1: OEE Uplift for Low Baseline / Early-Stage CI Maturity

This group demonstrated the greatest level of OEE uplift at 13.6pts against a starting baseline OEE of 37.4%, which translates to a productivity increase of 36.4%. These results reveal how factories who are at a relatively low starting point in their CI journey can notch sizable gains in 90 days by applying the Redzone approach. There is no need to spend time and resources evolving CI maturity before beginning the program when teams can immediately make rapid progress using the Redzone methodology and tools.

Group 2: OEE Uplift for High Baseline / Early-Stage CI Maturity

Factories in Group 2 have a higher-than-average OEE baselines, but haven't yet tapped into the opportunities available through a systematic CI approach. These factories achieved an average 11.5pts of OEE uplift against a baseline of 60.7%, a 18.9% increase in productivity. This demonstrates what can be achieved by refocusing CI efforts on the right priorities and leveraging the factory floor. While the business model stays the same, frontline teams improve losses due to changeover times and increase agility using Redzone methods and communication tools.

Group 3: OEE Uplift for Low Baseline / High Maturity

Group 3 tracks those factories that have a mature CI culture and have seen productivity increase through their CI program, yet their baseline OEE is not yet above the average at the start of their Redzone deployment. Group 3 achieved an average increase of 12.4pts of OEE against a baseline OEE of 44.1%, for an average 28.2% productivity increase during their 90-day deployments. This group has strong CI habits and culture in place. They leverage Redzone to supercharge their CI program to eliminate the admin work required to identify OEE losses and leverage real-time data and communication to tackle those losses proactively.

Group 4: OEE Uplift for High Baseline / High Maturity

Group 4 includes those factories who already have best-in-class CI cultures and high starting OEE. This group typically includes large, technologically advanced factories possessing significant CI expertise and a strong workforce commitment to improvement.

Why would these mature companies in Group 4 become Redzone community members? Because even in well-run facilities, there are opportunities for improvement. A factory might have plateaued in terms of productivity gains and wants to boost its current OEE from the mid 60s or 70s to capture those harder-to-quantify opportunities and reach the OEEs in the elusive 80s and 90s. And, sustain these hard-won improvements once achieved. Even with high starting OEE baseline of 72.6%, factories in Group 4 achieved an average OEE uplift of 8.3pts, equal to productivity increase of 11.4%. These accomplishments are all the more impressive when comparing the investment in Redzone against the cost of other CI initiatives, such as increased automation and new equipment that require large capital outlays.

04 BENCHMARK RESULTS (CONT'D)

4.3.1 Results at 90 Days by Industry and Factory Size

This report benchmarks results by both industry and factory size (as implied by factory revenue). There is, as the data shows, not much variation among starting OEE by industry type. Average starting OEE across all industries is 47.4% with a range of 35.7% to 53.9% by industry. Productivity increases documented in the 90-day Redzone deployment range from 20.4% to 40.3% by Industry.

Fig. 11: Distribution of Baseline OEE by Industry

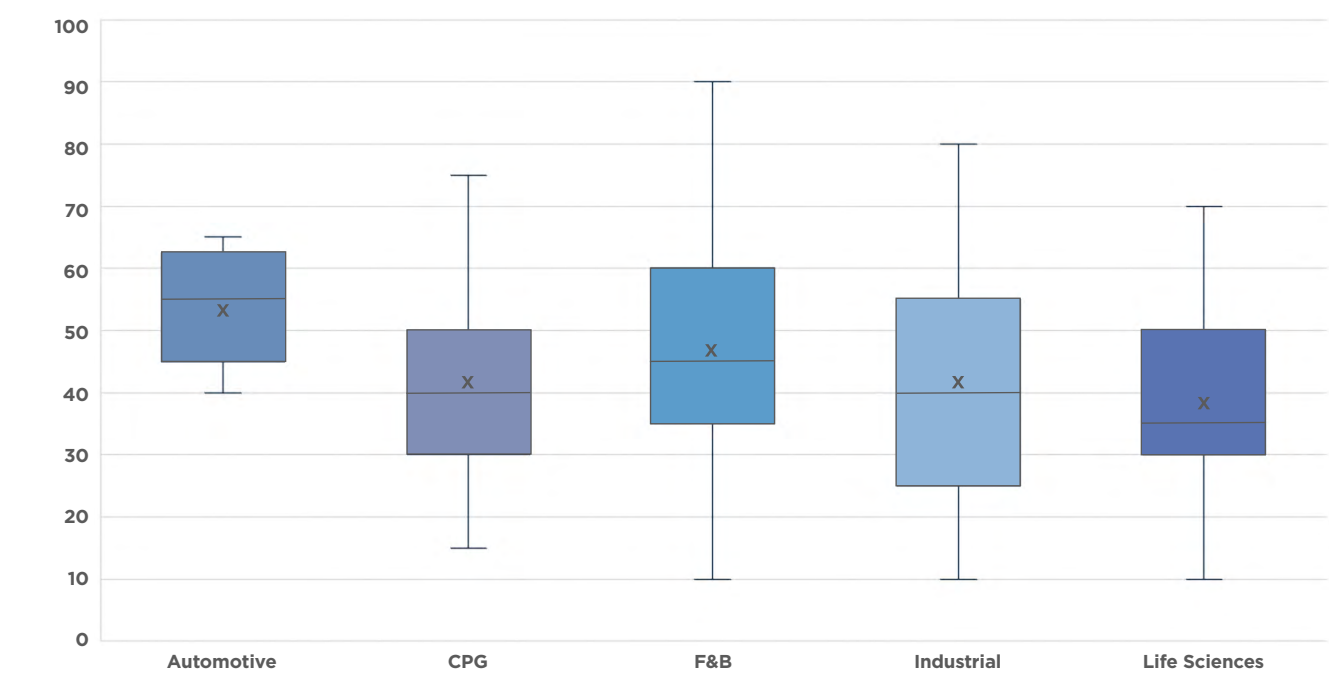


Table 2: Baseline OEE and Productivity Increase by Industry

Industry	Avg. Baseline OEE	Avg. OEE Uplift (pts)	Avg. 90-Day Productivity Increase
Automotive	53.9%	11.0	20.4%
CPG	40.2%	14.3	35.6%
Food & Beverage	47.0%	12.4	26.3%
Industrial	41.8%	13.0	31.2%
Life Sciences	38.2%	12.7	33.3%
All Factories	47.4%	12.5	26.4%

A more direct correlation can be made between starting OEE and factory revenue/factory size. While there are exceptions within every category, factories with higher revenue and that produce higher volumes tend to have higher starting OEEs. Several factors contribute to this. As one would expect, higher revenue factories have more resources to invest in engineering and expansion to drive efficiencies. Additionally, as factories grow, they often harmonize their product mixes by processing line and increase minimum order sizes to reduce time lost in changeover. They often also have more mature CI programs in place. Smaller factories often don't have those options available to improve their OEEs.

Fig. 12: Distribution of Baseline OEE by Factory Revenue

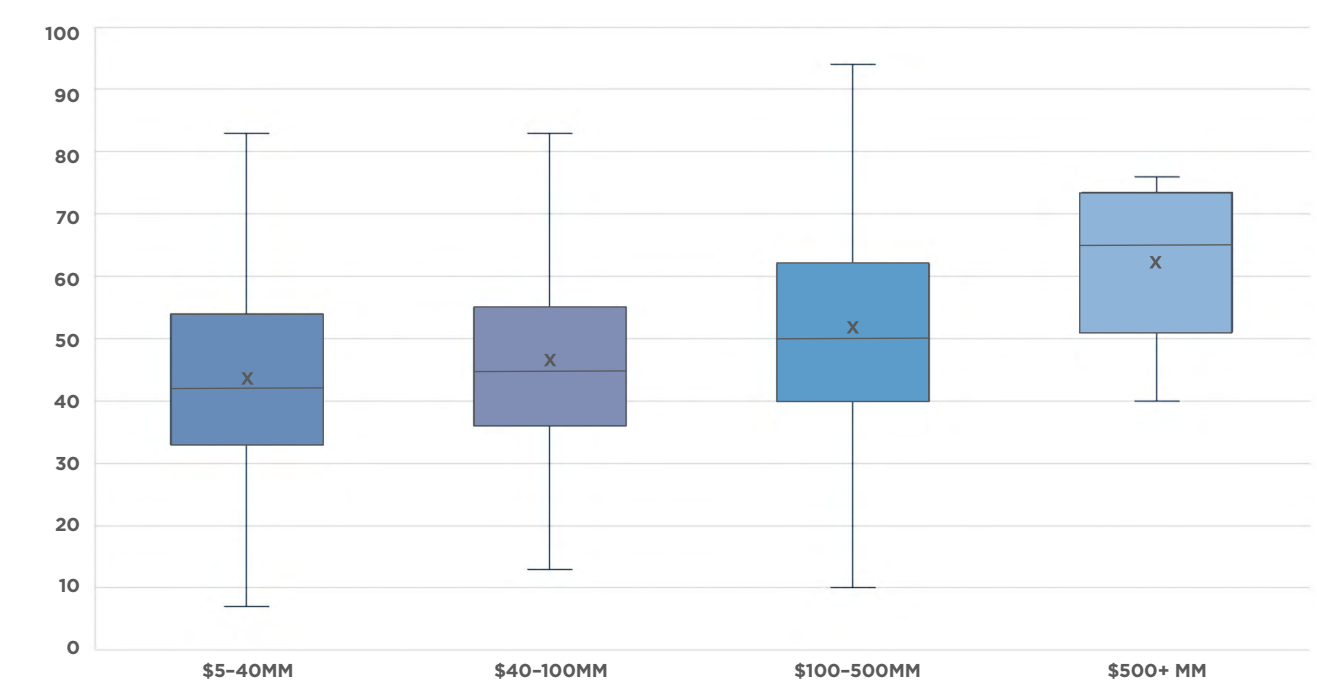


Table 3: Baseline OEE and Productivity Increase by Factory Revenue

Annual Factory Revenue	Avg. Baseline OEE	Avg. OEE Uplift (pts)	Avg. 90-Day Productivity Increase
\$5-40 MM	44.1%	13.6	30.9%
\$40-100 MM	45.2%	10.2	28.8%
\$100-500 MM	50.0%	11.7	23.5%
\$500 MM	65.6%	9.5	14.4%
All Factories	47.4%	12.5	26.4%

When evaluating the correlation of factory revenue size to starting OEE, an average starting OEE that increases by each revenue band is observed. The average observed starting OEE in factories with annual revenue less than \$40MM was 44.1%. Factories with annual revenue that exceeds \$500MM had an average observed starting OEE of 65.6%. Regardless of the starting OEE, every factory observed a significant productivity increase in 90 days of using Redzone.

04 BENCHMARK RESULTS (CONT'D)

4.3.2 Global Deployment Results at 90 Days

In 2013, Redzone created a new category of productivity enablement for factories, the Connected Workforce Solution. By 2020, Redzone was a familiar presence in US food manufacturers. Since 2020, Redzone is increasingly deployed globally as its reputation in US F&B factories has garnered recognition worldwide. In 2024, 41% of deployments were in international or industrial segments. This has initiated a data set that can be analyzed for patterns within international deployments. This data set will continue to grow as the Redzone global manufacturing community continues to grow.

5 Continents and 25 Countries: Significant productivity increases are observed in factories that deploy Redzone, regardless of where those factories are located.

Fig. 13: Distribution of Baseline OEE by Global Region

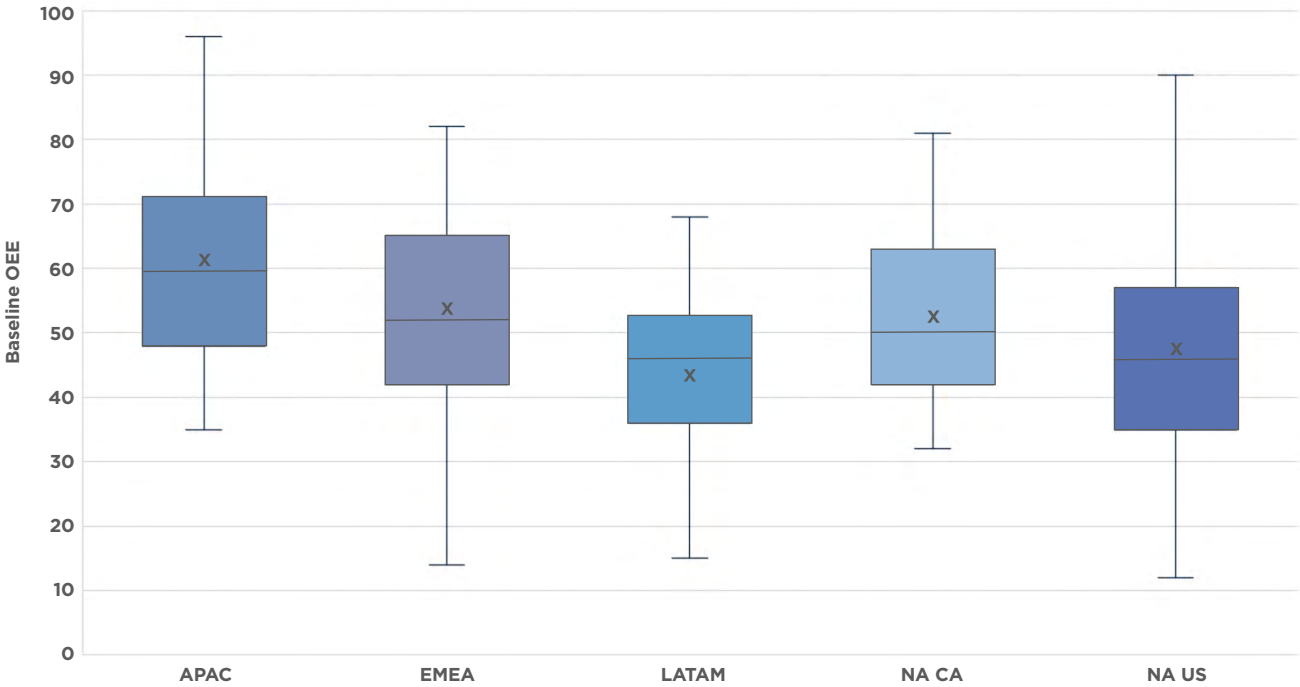


Table 4: Baseline OEE and Productivity Increase by Global Region

Region	Avg. Baseline OEE	Avg. OEE Uplift (pts)	Avg. 90-Day Productivity Increase
APAC	60.6%	11.1	18.3%
EMEA	53.2%	11.0	20.7%
LATAM	44.8%	14.1	31.5%
NA CA	52.6%	11.6	22.1%
NA US	46.7%	12.7	27.2%
All Factories	47.4%	12.5	26.4%

4.4 Sustainable Change

Sustainability is critical to the impact of any program and is a measure of the depth of adoption and lasting culture change made through that program. This is especially critical in a CI program. Redzone factories are evaluated at one year and 1,000 days to assess uplifts after the 90-day Redzone program and those results are included in this report.

The factories in the Redzone community not only sustain – they continue to increase – the uplifts seen during the initial 90-day Redzone program. Average total increase in points of OEE from original baseline OEE for Redzone community members at 1,000 days since their Redzone deployment program is 24.2 points.

Fig. 14: Average OEE Uplift by Week Over Year One Using Redzone

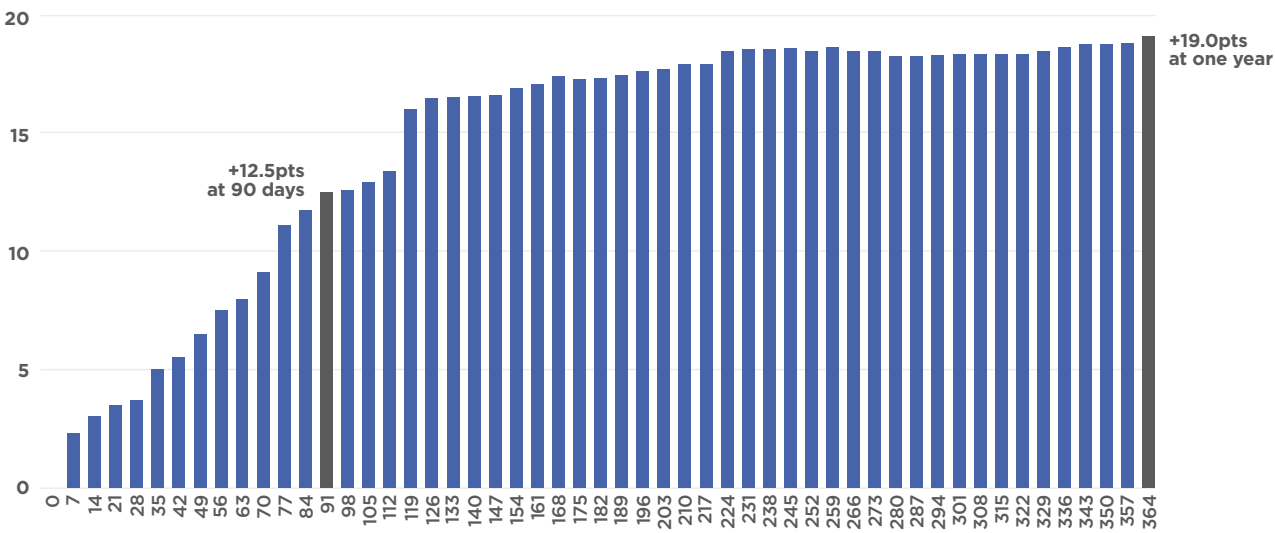
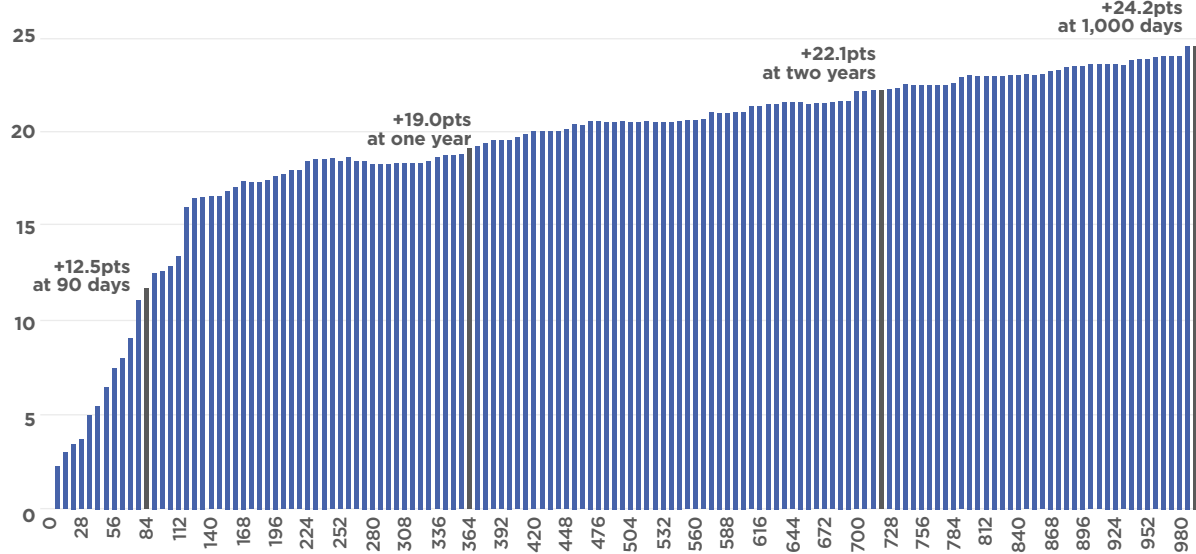


Fig. 15: Average OEE Uplift Over the First 1,000 Days Using Redzone



All Redzone community members that have completed three years of usage to date are included in this longitudinal study. These results demonstrate to both business stakeholders and factory managers that it is possible to increase gains over time, regardless of process type, operational size, and starting OEE and CI maturity levels.

04 BENCHMARK RESULTS (CONT'D)

4.5 Annualized Savings

Senior leaders care about cost savings, which they can channel into other CI programs or return to the business. OEE uplifts, when combined with existing labor and overhead costs, can easily be converted to ROI metrics to demonstrate the financial impact of a Redzone deployment. The table below illustrates average labor and overhead savings opportunities for every one point of gain in OEE, as reported directly from the Redzone Community.

Table 5: **Average Annualized Savings by Factory Revenue**

Annual Factory Revenue	Avg. Baseline OEE	Avg. OEE Uplift (pts)	Avg. 90-Day Productivity Increase	Labor Opportunity (per 1 pt of OEE)	Annualized Savings
\$5–40 MM	44.1%	13.6	30.9%	\$51,157	\$679,069
\$40–100 MM	45.2%	10.2	28.8%	\$114,449	\$1,491,461
\$100–500 MM	50.0%	11.7	23.5%	\$145,800	\$1,837,519
\$500 MM +	65.6%	9.5	14.4%	\$343,704	\$3,259,257

It is important to note these generalized savings are just a starting point. They represent savings opportunities from the Productivity module expressed as savings in direct and indirect hourly labor spend. Even if cutting labor hours is not how a factory intends to realize its productivity gains, it is meaningful to represent savings this way as it also reflects the reduction in labor spend per units made when the factory is more efficient. These labor savings do not include other sources of savings realized by Redzone customers, such as: reducing overtime hours; reducing shift schedules; reducing turnover; decreasing packaging waste; reducing overfill; or achieving further gains from Kaizen-style problem solving.

Each of the follow-on modules, Compliance, Reliability, and Learning, drives additional productivity increase and therefore additional labor opportunities. See Fig. 17 for uplifts by module.

4.5.1 Application of Savings

Potential savings include both labor and overhead savings opportunities. The most important takeaway from the chart is that when factories are in control of their manufacturing process, factories are in control of their financial destiny. By improving OEE they can align the factory floor with their strategic initiatives.

- Does the strategic plan require more sellable units? Higher efficiencies mean more production with no additional labor hours, headcount, or line time required.
- Does the strategic plan include cost reduction for profitability? Producing the same number of units more efficiently translates to annualized labor savings that further translate to increased profitability.
- Or, does the strategic plan require significant re-investment in the business? Companies are able to leverage these savings to fund other corporate initiatives such as equipment purchases or ERP systems.

4.5.2 Additional Savings Through Kaizen Events

Kaizen is a foundational element of continuous improvement philosophy. Kaizens are a deep-dive problem-solving methodology in use in factories across the world. Redzone Kaizen events are super-charged versions of this CI standard. Redzone Kaizen events are coach-led intensive problem-solving weeks. Every manufacturing opportunity is aggregated and ascribed a value in Redzone. This means it takes no factory resources to identify a top loss and define a meaningful Kaizen charter around it. During a Redzone Kaizen week, an inter-departmental factory team identifies the contributing factors to that top loss, collaborates on ideas and actions to eliminate recurrences of it, and monitors the impact of those actions through the subsequent productivity increase in Redzone.

Table 6: **Kaizen Event Average Reported Annualized OEE Uplift and Savings**

Kaizen Event Focus	Avg. OEE Uplift (pts)	Avg. Annualized Savings
Productivity (Top Loss)	2.6	\$260,410
Compliance (Giveaway)	1.2	\$351,101
Compliance (Rework / Holds)	1.9	\$234,799

These one-week events are impactful. Customer-reported financial results show the impact of these Kaizen weeks. Kaizen events conducted during the Productivity module averaged \$260K in annualized savings as reported by customers. Kaizen events during the Compliance module are reported by customers to save an average of between 234k and 351K. Kaizen events in the Compliance module tackle top process losses just like in Productivity. However, they often include material losses associated with those process losses as well, such as overfill and rework, leading to the higher average value of these events in the Compliance module.

Kaizen events can occur during any of the Redzone modules. Additionally, any Redzone community member can add these weeks as standalone coaching weeks for added focus on a top loss.

4.6 Cultural Transformation

Study participants reported a host of cultural improvements, such as enhanced communication and collaboration, greater worker engagement and retention, lower absenteeism, enhanced operational flexibility and agility, and more.

Manufacturers are competing with other industries for talent. As a result, being able to point to a strong, engaged workforce; easy-to-use, enabling technologies; and a culture of collaboration and celebration can be a strong attractor for potential candidates.

Culture is important to the bottom line, but ‘culture’ can be an elusive concept. Redzone’s 2024 Engagement Benchmark report has quantified the cultural transformations. In addition to the efficiencies gained while deploying Redzone (on average, 26.4%), Redzone customers reported simultaneous improvements in factory floor culture. Redzone customers reported an average 35% reduction in employee turnover and 81% increase in employee engagement.

By deploying Redzone, factories realize greater efficiencies AND increase employee engagement.

4.6.1 The Flywheel Effect and Change That Lasts

Frontline workers want to work with meaning and purpose, *Winning the Day* for their employers. Too often in the past, these valuable individuals have been on the receiving end of well-intentioned, but impractical, CI programs.

Redzone unlocks the inner creativity of frontline workers, enabling them to provide ideas on process improvements, share the wisdom they have gained working in their roles, and socialize best practices. As a result, these workers become CI champions and agents of change. When workers are engaged, adoption is easy and changes are sustainable.

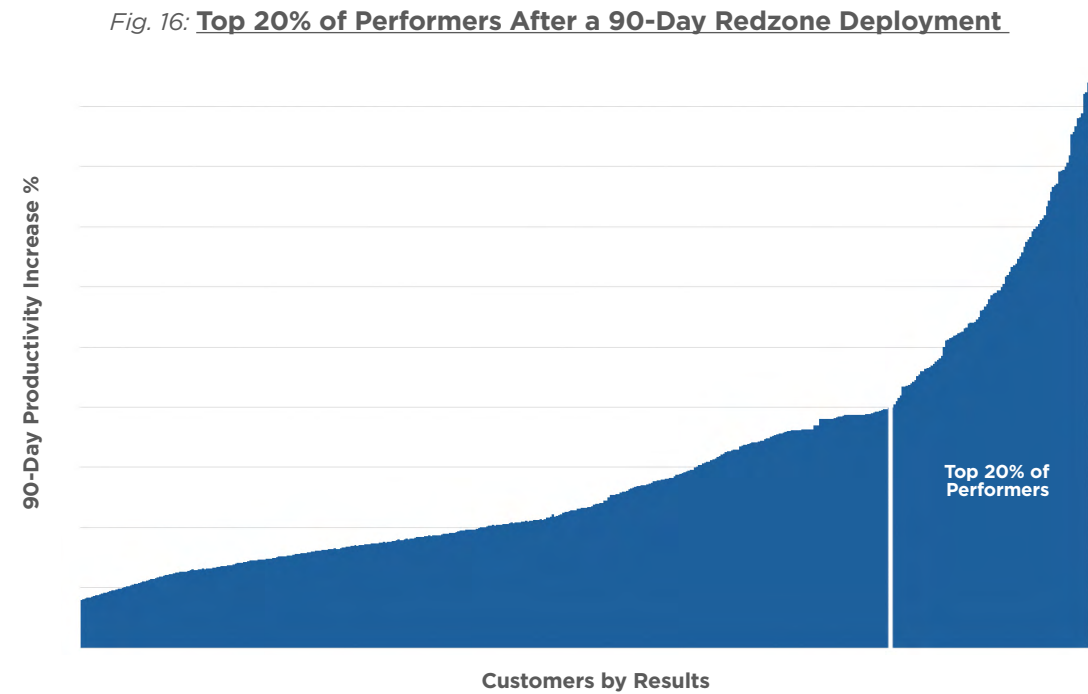
The success of such a diverse mix of participants shows how true CI demonstrably and reliably drives productivity increases and improves financial results.

Average OEE and productivity gains across all manufacturing factory participants at the 90-day mark, combined with further analysis based on factory demographics, predicts real gains for any factory considering the Redzone Solution.

05 WHAT THE MOST SUCCESSFUL FACTORIES DO DIFFERENTLY

Beyond the uplifts shared, Redzone coaches and community members share their own in-field observations around the Redzone methodology and use of the Redzone platform during deployments. Redzone takes these insights to continually evolve the platform and approach, benefiting both existing and new community members alike.

Within the Redzone community are factories who achieved outsized results during their 90-day Productivity deployments. The top 20% of performers have been found to have five behaviors in common. There is a correlation between strong adherence to these behaviors and higher-than-average uplifts. Adopting these behaviors is predictive of success.



What can you do to become one of these leaders and maximize your deployment? The following five factors are key drivers in contributing to sustained CI success.

5.1 Leadership Engagement in CI

Winning and sustaining the senior leadership team’s (SLT) sponsorship of CI programs is critical to their success. Leaders champion these programs, provide ongoing investment, and offer air cover as programs take flight and teams work through issues. CI programs are designed to unearth opportunities within the factory walls. Leadership teams that engage deeply and encourage these opportunities to come to light see the highest uplifts.

With SLT involvement, workers trust their leaders and feel recognized for their individual and team achievements. Most important of all, workers believe in the CI program and are empowered to contribute.

5.1.1 Leadership Team Participation

Across community members, SLTs who were highly involved with their immediate reports and frontline workers helped create a collective will to win with CI. They engaged in structured interactions, such as participating in kick-offs, Town Halls, and video updates, and shared encouraging messages around team wins via Redzone communication tools. They also had unstructured interactions, such as holding informal conversations with individual workers or small groups. Leaders focused teams on the right priorities, listened to their ideas and incorporated the best ones, and gave them feedback and encouragement.

5.1.2 Rigorous Review

Workers are more invested in data collection when teams are invested in using the information. The more accurately and insightfully data is collected, the more valuable it is to factory floor and leadership teams. This is the flywheel effect of data accountability: cadenced use and review of data improves the quality of the data and the quality of the decision-making driven from it which keeps teams engaged in the collection of data. This accountability is baked into the Redzone methodology through Forums.

5.1.3 Forum Discipline

Having the right discussion at the right time with the right people who are reviewing the right opportunities: this is critical to success. Leading factories all maintained exceptional discipline around structured Forums, both at an operational and leader level. Across these activities, factories consistently leveraged three types of key Forums:

- 1. Factory floor huddles in each production area were held at predetermined points during shifts and involved a representative from each of the Production, Maintenance and Quality teams.
- 2. Daily operations meetings involved Production, Maintenance, and Quality management.
- 3. Weekly process improvement meetings involved senior operational leadership and members of the management team.

The format of each Forum in the Redzone platform is aligned with universal CI methodology. The factory floor huddle structure in Redzone is intuitive and easy to use because adherence to, and engaging teams in, this activity is a key driver of uplift.

5.1.4 Communicate the Obsession

Communication around prioritized organizational goals means everyone understands what is most important to the factory. This prioritized goal is the *obsession*. Many top-performing community members held their daily operations meetings out on the floor, in front of a large screen displaying Redzone. As a result, all involved team members and bystanders were aware of reviewing real-time performance data and that target actions were being completed, as another way to demonstrate the obsession. Every department and every level have a way to contribute to that corporate obsession once it is shared.

5.1.5 Factory-wide Communications, Recognition, and Celebration

Leading factories had more open and frequent dialogue with frontline workers and made significantly more use of the social and unstructured communication capabilities in Redzone. A typical example would be a manager giving a team a virtual *high five* in the app for boosting production on a shift or solving a thorny problem.

These factories were also significantly more frequent users of Redzone’s communication and collaborations tools such as Chats, Issues, and Alerts, enabling greater team problem solving and on-the-spot decision making. Social, mobile communications created greater team cohesiveness, with members working better together to accomplish something significant.

Leadership teams also knew how to celebrate. They created highly visible mechanisms to monitor and share progress reports on the most productive activities. These leaders knew that rewarded behavior is repeated behavior. Thus, they used more Redzone recognition tools, such as *high fives* and *good catches*, catching frontline workers for doing the right things

Through formalized channels these leaders publicly recognized individuals and team efforts, sometimes coupled with concrete awards such as monetary bonuses. For example, they hosted competitions and ceremonies with financial rewards honoring those individuals or teams with outstanding ideas and performance. These workers and teams were also recognized at Town Halls, with their accomplishments tied to company goals and performance.

5.2 Refining the Impact of Redzone

As mentioned in the first section, Redzone team members are one of the audiences for this benchmark report. Functional teams such as Coaching and Software, and all levels of leadership, look to the insights from the previous deployments when refining the platform and developing deployment methodology. The ever-improving results are a reflection of the continued evolution of the Redzone solution and coaching methods. Since the publication of the first benchmark report, the Redzone Connected Workforce Solution has continued to evolve. The first cohort group reported 11.8% productivity increase. As a CI company, Redzone has studied its own result set to identify what predictably leads factory teams to success and how to engineer success into the platform and deployment process. *Redzone customers now realize 26% productivity increase in just 90 days.*

06 BEYOND THE PRODUCTIVITY MODULE

The Redzone Productivity module revolutionized manufacturing. By having a simple, digital, and cohesive set of CI methodologies and meaningful, intuitive dashboards fully integrated into the factory floor, a factory can see its opportunities immediately. The Productivity module breaks down communication siloes with real-time production dashboards that Production, Maintenance and Quality teams reference when participating in shared opportunities and outcomes.

6.1 Continuous Improvement

With the factory floor communicating, collaborating, celebrating, and engaged, what is the next big opportunity for improving manufacturing processes? Redzone's Compliance, Reliability, and Learning modules leverage the connected workforce established with Redzone Productivity.

6.1.1 Compliance:

Redzone Compliance is a seamlessly integrated quality and production record with dashboards and data trending to both confirm and ensure production to expected standards. Quality checks are not outside the manufacturing process, they are fully integrated into the whole factory system. When factories begin using the Compliance module in conjunction with the Productivity module, the number of communications between employees grows exponentially. These factories super-charge their communications in addition to their quality programs.

6.1.2 Reliability:

2019 brought the Reliability module. Manufacturers told us their Maintenance teams were using multiple systems to address work orders, communication, and parts levels, but they were only creating more admin burden while still finding critical gaps in their programs. Redzone Reliability increases factory floor awareness of breakdowns, drives efficiencies in maintenance activities by improving visibility for Maintenance and Operations teams, and ensures stock levels and parts consumptions are clear and in real time.

6.1.3 Learning:

The Redzone Learning module was developed around employee engagement and empowerment. More than an LMS, the Learning module changes where and how team members engage with content relevant for their current roles. With skills inventories and certifications, factory leaders can quickly see the level of cross-training across the factory floor. Operators can just as quickly see their own skills inventory and understand what's next in their career progression. This module is the 'multiplier' module, enhancing each Redzone module and production activity in addition to being a standalone LMS.

6.2 Observed Uplifts by Module

The 2025 benchmark report analyzed the data from the 90-day deployments of all four major modules: Productivity, Compliance, Reliability, and Learning. Each subsequent module brings uplifts in addition to the initial uplifts seen with the Productivity module. Each module reinforces the modules before it, engaging more team members and departments. Self-generating reports in Redzone become even more meaningful when operations, maintenance, and quality activities can be accessed and cross-referenced from a single source.

Fig. 17: OEE Uplift by 90-Day Redzone Module Deployed

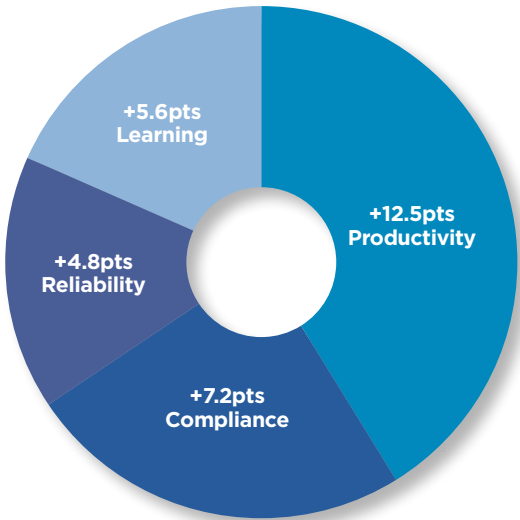


Table 7: Productivity Increase by 90-Day Redzone Module Deployed

Redzone Module	Avg. OEE Uplift (pts)	Avg. 90-Day Productivity Increase
Productivity	12.5	26.4%
Compliance	7.2	12.6%
Reliability	4.8	7.9%
Learning	5.6	9.7%

6.3 Product Development History

Redzone actively invests in continued product and software development. The Redzone community is the beneficiary of this ongoing platform development. All customers receive all product updates through their Software as a Service (SaaS) license; customers are always on the most recent version, able to access the growing suite of features in each of the modules that they have purchased.

Table 8: Redzone Solution Enhancements, 2013 – 2024

Year Enhancements Introduced	Description of Software and Coaching Enhancements	Avg. OEE Uplift	Avg. Productivity Increase
2024	Enterprise Collaboration, In-app AI Tools and Web-based Admin	12.5pts	26.4%
2023	Enhanced Workflows, Pre-built Web Reporting and AI Transcription		
2022	Throughput Mode, Labor Locations and Learn Module		
2021	Assembly Step Locations and Centerlining		
2020	Video Conferencing and Customer Success Team		
2019	Reliability, Google Translate, Offline QA and Success Planning		
2018	Deliberate Practice Weeks and Embedded SPC	6.6pts	11.8%
2017	Daily Vital Signs, Problem Solving and IOPQ		
2016	Compliance Module and In-app Recognition		
2015	Win The Day Routines and Standardized Deployments		
2014	Digital Forums and Huddles		
2013	Real-time OEE and Communications Platform		

6.4 What's Coming Next from Redzone

Redzone works with its community members to understand what they see as the next opportunity for improvement in their manufacturing organizations.

Adding real value to customers' factory processes and communities is the Redzone obsession and guides product development. Every feature considered is viewed through the lens of this question, "How will this make factories better?" Will a feature: facilitate meaningful communication? drive action? engage the factory floor? ensure process and product quality? eliminate admin burden and redundant work?

As evidence of that CI obsession, Redzone has released the following new capabilities, purpose-built to support and accelerate improvements within manufacturing. These newly released features further enhance and enrich the work of the frontline. These features connect the activities of the factory floor to other critical manufacturing systems, other factory teams, and the wealth of information generated each day.

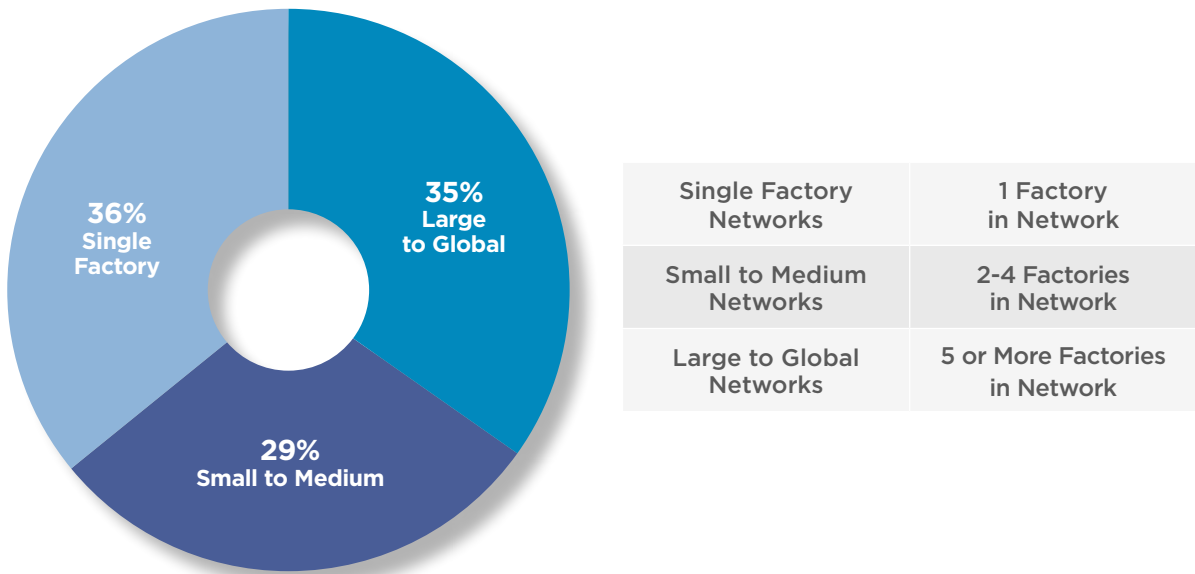
6.4.1 Cross-site Collaboration

64% of the Redzone community has two or more factories. 25% are global customers with seven or more factories.

The incredible uplifts seen by the Redzone community in their 90-day deployments leveraged communication and collaboration among team members within a single factory. Unlocking information, insight, metrics, best practices, collaboration between factories – no matter their location – is the next logical step.

This is *Cross-site Collaboration*. Chats can now happen between facilities, next door or across the world. Coupled with Google Translate embedded into the Chat function in Redzone, and AI-powered transcription and translation of recorded Plays, previously impossible collaborations are as easy as sending a chat. Web-based reporting pulls KPIs from separate facilities into a single report. Redzone administration is also now managed at the corporate and divisional levels, allowing centralized management of documentation, specifications, and forms.

Fig. 18: **Factories in the Redzone Community by Enterprise Network Size**



6.4.2 Champion AI

Artificial Intelligence is everywhere yet many of the current applications in the workplace aren't making significant improvements to manufacturing. *Champion AI* was developed to assist manufacturing teams with complex issues. Humans are manufacturing's strength. Strengthening the actions and decisions humans make every day in the management of their roles changes manufacturing outcomes significantly.

Champion AI works within a factory's own data environment to identify anomalies, proactively recommend solutions, and speed up process improvements. Teams are now able to prevent problems before they occur.

6.4.3 Advanced Integrations

Redzone has always included the ability to integrate with outside sources on common fields such as product specifications and run rates. Historically, Redzone has not focused on developing out-of-the-box integrations with other systems because integrations do not drive productivity uplifts. However, integrations do reduce redundancies between systems and eliminate administrative burden for the factory floor, functional leaders, and finance teams.

Advanced Integrations are actively being developed in alignment with the priorities of the Redzone community. Redzone continues to identify and develop ways to reduce inefficiencies in factory floors and offices that can be answered with integrations.

Redzone is everywhere. It's proven to work in every industry and every region. It works in small startups and global organizations. If you could reduce your labor spend by 25%, what initiatives could you fund with those savings? If you could produce 25% more product without more overtime or equipment, what new markets could you conquer?

When you deploy Redzone, you reap the benefits of a highly engaged workforce, higher OEE and productivity, and data and tools that help you continue delivering CI gains, year after year. You can start today and deliver stunning improvements within 90 days of implementing Redzone.

Contact us to learn more about how Redzone will benefit your business this year.

Ken Fisher
Senior Vice President Product – Redzone
Learn more about the Redzone Connected Workforce Solution at rzsoftware.com



8.1 Overall Equipment Effectiveness (OEE)

Manual calculations of OEE rely on recorded downtime and scrap figures to derive the performance losses from a perfect 100%. As downtime and scrap are often misrecorded in manual systems, collecting this data automatically using sensors, as the Redzone Connected Workforce Solution does, is much more accurate.

OEE is made up of three components:

- **Availability** (uptime as a percentage of available time): A threshold percentage per minute is set, to define the level at which a line is considered to be running (uptime) or stopped (downtime) as compared to available time which represents all time where the production line or cell is scheduled to be running. This includes all changeover times and interruptions to the factory floor. It does not include any time where the lines are not scheduled to run, such as non-productive shifts or non-working weekends.
- **Performance** (actual rate of production while running, as a percentage of theoretical maximum rate): This is measured by Redzone every minute the line is running and compares the actual output quantity of material against the theoretical maximum rate (safe-running engineering capacity) of production output. This rate differs by SKU so Redzone records which product is running at all times, to allow comparison with the planned rate stored against each SKU, which can be additionally specified by production line.
- **Quality** (output quantity as a percentage of quantity produced on the line): Redzone records scrap and rework on the line, including where the losses occurred, with reason codes, to enable the capture and analysis of losses and rework.

Table 9: **Standard OEE Calculation**

The standard calculation for OEE is:

Availability % x Performance % x Quality % = OEE
95% x 95% x 95% = 85.7% OEE

By way of example, a 95% in each of these metrics results in an OEE of 85.7% which is accepted as world-class OEE performance of 85% or greater.

8.1.1 Additional KPIs in Redzone

Factories track their performance and success in a number of ways. OEE is just one measure of a factory’s performance tracked within Redzone. Other KPIs used by factories to assess their performance are also calculated and trended automatically in Redzone. These include:

- | | | |
|-------------------------------|----------------------|-----------------------|
| • units per hour (UPH) | • takt time | • giveaway |
| • units per labor hour (UPLH) | • daily throughput | • total labor hours |
| • cycle time | • unplanned downtime | • production capacity |

Because of integration of modules in a single platform, complicated correlations can be identified quickly that would otherwise be nearly impossible to ascertain. This creates the power for Redzone customers to identify and track KPIs for themselves that are highly specific to process.

8.2 Process Segment Descriptions

Any manufacturing process can be reflected effectively in real-time Redzone dashboards. Following are the descriptions of common manufacturing processes, all of which are in use by the Redzone community. Additionally, flexible configurations in Redzone create the opportunity for many non-manufacturing operational processes to be tracked and shared in real time.

Continuous automated processing

Manufacturers use fully automated processes to ensure a continuous flow of material. Automation can include mechanical, hydraulic, pneumatic, and electric systems, which are controlled all or in part by digital systems.

Semi-automated processing

With this type of manufacturing, some steps are automated, whereas others are performed manually by workers. Manual processing is required before WIP material can be finished by automated processing. Similarly, manual processing is required to finish the manufacturing process that began with an automated process.

Single-operation batch processing

Bulk material is processed as a single quantity which undergoes one or more value-added steps before it is finished. This may include blending operations, tank fermentation, hardening, drying, and similar. Processes of this nature are often described in terms of target time vs actual time required to process a batch rather than units of throughput.

Machine cycling

Parts are produced singularly or as a group by a machine or machines that transforms the materials, often through a forming, cutting, or heating step. These operations have a defined cycle time, meaning the operation has a clear start and end. Often these are high-speed processes.

Unit assembly line

Manufacturing flows down a line at a consistent pace as parts are added sequentially to a single assembled piece. Each workstation is dedicated to a specific step in the assembly process. Offline subassemblies are often produced simultaneously to feed the primary manufacturing line.

Manual assembly

Humans perform all production steps, without any machine intervention. Manual assembly is typically used for low-volume manufacturing work, artisan products, or complex, highly technical products unsuitable for simple automation.

8.3 What Does a Redzone Connected Workforce Solution Deployment Look Like?

Redzone is deployed consistently and intentionally across every customer by a Redzone team with a set of objectives to build or enhance factories’ CI programs in just 90 days.

8.3.1 Rapid Time to Value

The Redzone Connected Workforce Solution goes live with clean data and enables full utilization of the system within weeks. An internal Redzone goal is to have an operational system with a trained team in the focus areas at the end of the Redzone coach’s first week onsite.

Deployment time frames compare favorably to other technology. MES, ERP, or CMMS commonly take 6-18 months for initial implementation and require extensive resources to fine-tune workflows or expand functionality. Compare this to the 6-12 weeks required to be using Redzone on your factory floor. Your Redzone coach will begin teaching use of the software to the factory floor in the first day of on-site coaching. With the speed at which Redzone is both functional and integrated into the factory floor routine, ROI for the total cost of the deployment is often six months or less.

8.3.2 Redzone Deployments: 3 Pillars for Success

Project Management: Deployments begin with the Project Management phase, approximately 8 weeks of Redzone-guided preparation. Every new community member is assigned a Redzone project manager that will track the customer’s progress towards their deployment preparedness. Their project manager partners with them to establish the new environment and support the factory by making technical recommendations, answering questions, and providing the first look at the configured environment to the SLT.

Expert Coaching: Technology on its own changes little without ensuring users’ behavior evolves to take advantage of the technological capabilities. This is why Redzone is a coached-in solution. Redzone coaches are Redzone employees who are former operations managers, CI leaders, and engineers. Redzone coaches have industry experience in addition to being Redzone experts. Their experience leading factory floor teams positions them perfectly to support your factory, leadership team, and factory floor employees. They will partner with your frontline leaders to drive adoption across the factory. Consequently, Redzone deployments are fundamentally different from what our customers have often experienced in the past from technology solutions or consulting.

Redzone coaches are helping you sustainably establish the following during your 90-day deployment:

- A visual factory with real-time OEE measurements and top-loss tracking, visible and meaningful to the factory floor
- CI production perspectives, effective meetings, and collaborative problem-solving across all departments and levels in the factory
- Measurable uplifts in focus lines, as evidenced through Redzone tracking and verified by factory finance functions
- CI cadences to ensure gains of the first 90 days are sustained and additional uplifts achieved after the initial deployment
- In partnership with the factory, identify next steps for the factory to continue achieving uplifts
- SLT reports for ongoing monitoring of engagement with Redzone at all levels (a leading indicator of continued uplifts)

Community Support: Redzone provides ongoing support in several forms, available to every Redzone Community member.

- *Community Success Coaches* – post-deployment, every Redzone customer is assigned a regional coaching leader who is a primary point of contact for guidance on optimization of Redzone on the factory floor as factories grow and change
- *Redzone Knowledge Base* – in-depth and relevant articles, available to every Redzone user, with easy searches by topic and results enhanced by AI
- *Redzone University* – free online training available in the use of each Redzone module provided as an easy way to train new employees and upskill existing users
- *Support Desk* – Redzone support requests are initiated from within the Redzone app, ensuring that questions directed to the Support Desk are connected to a specific customer environment and user for industry-leading ticket resolution times
- *Feature Releases* – New features and software updates are announced 30 days before general release allowing Redzone customers to take advantage of new features and ongoing Redzone product development
- *Community Events* – Manufacturers have more in common than not. Redzone organizes regional events to enable the Redzone Community members to meet each other socially as well as to collaborate on macro events affecting them all.

Each of these methods of support is designed to help Redzone customers maximize the benefits of the Redzone system as their factories grow and evolve. Redzone’s assumption is that factories will add users, add products, and add or reconfigure their manufacturing lines many times over. Therefore, the architecture and interfaces of Redzone have been intentionally built to be easily expanded and reconfigured by our customers themselves to put them in the greatest control of how they maximize Redzone on their factory floor.

8.4 Matrix of Early Stage and Mature CI Culture Attributes

Each factory in the Redzone community began its CI journey at a different level of maturity. The following list of attributes describes factories at each end of the spectrum of CI culture.

Table 10: **Comparison of Early Stage vs. Mature and Comprehensive CI Cultures**

Early Stage Process Improvement Program	Mature Continuous Improvement Culture
Standards are paper based or siloed in standalone systems	Standards are digital and available at the place work is completed
Tribal knowledge is hard to uncover and harder to share	SMEs are easily identified by improved outcomes and share their insights
SOPs exist but not preventing manufacturing failures	Interactive SOPs integrated into workflow increase engagement and ensure accuracy
Operations meetings happen but are not focused on <i>Vital Few</i> goals	Meeting cadences: at set times with the right stakeholders and focused on <i>Winning the Day</i>
Quality Control	Quality Assurance
Quality checks are paper based and archived after completion	Quality checks are digital and results are visible in Ops, R&D, and Leadership routines
Reviewing results is labor intensive and takes hours after the run is complete	Results are instantaneous and QA teams manage by exception
Focus is on catching quality issues after manufacture	QA, Engineering, and Ops teams collaboratively improve manufacturing to eliminate process failures
Maintenance Team	Autonomous Maintenance
Maintenance is the only team responsible for equipment care	Operators engage in the care of their equipment
Maintenance tasks are completed during scheduled downtime or breakdowns	Repetitive care activities are integrated into regular production activities
Individual department goals inadvertently in conflict, creating siloes	Transparency of factory targets creates shared responsibility for factory success
Factory Manager	Factory Leaders
Factory management is frustrated by a lack of ownership and engagement	Factory floor teams share responsibility for accomplishing factory-wide goals
Teams work in siloes and firefight through each day	Teams have visibility of the real-time performance to targets
A culture of extreme effort and overwork has developed	Factory-wide visibility of top losses drives CI initiatives for consistent, in-control manufacturing
Disengagement grows as frustrations mount at Operator and Management levels	Flywheel effect simultaneously drives outcomes and engagement and reduces employee turnover



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