ZPI® | **MONITOR & REPORT™**

Global Beverage Manufacturer Boosts Production with Help from ZPI

EXECUTIVE SUMMARY

The North American division of a global ready-to-drink-beverage manufacturer began using ZPI's Monitor & Report in 1999 on a single production line in a single facility. By mid-2021 Monitor & Report had been implemented and was actively used on over seventy (70+) production lines in over twenty (20+) filling facilities.

Expanded implementation and use of Monitor & Report over a 20+ period was based on four key benefits realized by the customer:

- Sustainable, Overall Equipment Effectiveness (OEE) filling line performance improvements ranging from 8 – 15% per production line
- Several thousand hours a year in time savings at the plant, regional & corporate levels
- Seamless data aggregation, transmission and integration with widely-used, centralized data visualization software systems
- Strong collaboration between customer and ZPI project teams produced a wide range of system upgrades and new capabilities that made Monitor & Report the data collection and reporting system of choice for this customer

Case Study Background

This case study summarizes a relationship and successful customer-supplier partnership that began with a single ZPI installation on one production line in a RTD beverage bottling facility.

Since 1999 the relationship has grown and evolved based on the value delivered by ZPI's Monitor & Report production line data collection and reporting system and by strong customer-ZPI collaboration.

As additional production lines and additional filling locations adopted ZPI Monitor & Report the collaborative relationship focused on constantly improving existing capabilities and adding new capabilities including custom features to meet the needs of a rapidly evolving business.

Based on the value created by Monitor & Report, and on the strength of the partnership, the customer will be implementing and standardizing on Monitor & Report throughout its North American production network.

Case Study Overview

This case study summarizes a relationship and successful customer-supplier partnership that began in 1999 with a single ZPI installation in a single RTD beverage facility.

The case study spans a twenty-plus year relationship which continues to grow so it has been written in three parts in order to best focus on the impacts most valuable to the customer:

PART I: FILLING LINE PRODUCTIVITY IMPROVEMENTS

PART II: TIME SAVINGS AT THE PLANT, REGIONAL & CORPORATE LEVELS

PART III: EXPANDED, SEAMLESS ACCESS TO PRODUCTION LINE AND OPERATIONS DATA THROUGHOUT A GLOBAL BUSINESS

Company Overviews

GLOBAL RTD BEVERAGE MANUFACTURER

The ZPI customer featured in this case study is the North American bottling network for a global Ready-To-Drink Beverage manufacturer. Their product portfolio includes:

- Carbonated Soft Drinks
- Juices
- Juice Drinks
- Sports Drinks
- Bottled Waters
- Iced Teas

ZPI's Monitor & Report is used in over twenty (20+) customer bottling and canning facilities on over seventy (70+) production lines.

ZPI, A PROMACH PRODUCT BRAND

ZPI is the master brand that develops, implements, and supports ProMach's family of software enabled, digital intelligence solutions for package goods manufacturers.

ZPI's Monitor & Report, originally referred to as ZARPAC or ZPI, is the subject of this case study.

ZPI Monitor & Report is a software-based tool that world class packaged goods manufacturers use to analyze and ultimately maximize the productivity of their packaging lines. It supports automatic production line data collection, real-time production line monitoring with machine status alerts, and on-demand reporting capabilities that can help identify the root causes of costly downtime or lost productivity.

RTD Beverage Customer Challenges

Individual bottling and canning plants needed automatic, accurate, real-time production line performance data to improve troubleshooting processes.

- Individual bottling and canning plants needed dependable, fact-based visibility for Continuous Improvement initiatives focused on increasing production line productivity by eliminating root causes of downtime and lost production.

The North American division of a global ready-to-drink-beverage manufacturer began using ZPI's Monitor & Report in 1999 on a single production line in a single facility. By mid-2021 Monitor & Report had been implemented and was actively used on over seventy (70+) production lines in over twenty (20+) filling facilities.

Monitor & Report Supports Detailed Analysis of Both Real Time & Historical Line Performance Data

Production line data collection and reporting processes were manual or in some cases semi-automatic:

- Labor intensive, time consuming and costly
- Downtime data collection and reporting were distractions from actually running production lines
- Inconsistent results due to human error
- Time lag between production, data capture and reporting limited opportunities for real time trouble shooting and problem resolution

No standard terms and definitions existed for data being collected and reported:

- Debates about the meaning and interpretation of reported data were common
- Communicating results to management was time consuming and misunderstandings were common
- Comparing results across facilities was extremely difficult

No standard reporting templates existed:

- Roll-ups for multi-location or regional reports were time consuming to produce
- Plant level, line level and/or SKU level comparisons were very time consuming and difficult to execute

Results

PART I: FILLING LINE PRODUCTIVITY IMPROVEMENTS

Implementation of Monitor & Report in customer production facilities consistently helped them increase and then maintain the productivity of their filling lines.

For plants using Monitor & Report for at least three years, sustained line OEE improvements ranged from 8% to 15% versus the initial baseline performance of a line at the beginning of Year 1.
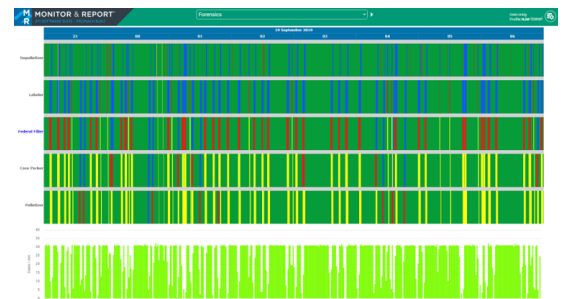
In terms of real-world annual OEE line performance improvements, here are a few examples for recent calendar year 12-month periods:

- ✓ East Coast facility, single serve line increased line OEE by 13%
- ✓ Northeastern facility, single serve line increased line OEE by 8%
- ✓ Midwest facility, single serve line increased lie OEE by 8%
- ✓ Southeastern facility, single serve line increased OEE by 3%
- ✓ Southeastern facility, single serve line increased OEE by 4%
- ✓ Canadian facility, single serve line increased OEE by 3%
- ✓ Canadian facility, multi-serve line increased OEE by 8%

Visual Representation of Production Line & Machine Performance for Any User Defined Time Period

In many cases, these OEE improvements were on top of single digit increases in prior calendar years.

Operating performance improvements based on Monitor & Report's analytic capabilities also created significant value for the customer. Here are a few examples based on detailed analyses of historical data that revealed the root causes of both downtime and scrap.

LABEL THICKNESS VARIATIONS – Using Monitor & Report, the customer was able to identify patterns of increased downtime and scrap that were ultimately related to different label SKU's and/or different label suppliers. After identifying this pattern, the customer was able to determine that variations in label thickness were the root causes of the problem. Labels for specific SKUs were thicker than others and there were thickness variations related to specific label converters.

CAP COLOR IMPACTS – Several customer plants suspected that closures or caps were contributing to both downtime and scrap variations. Using Monitor & Report's on-demand reporting capabilities, the customer was able to identify patterns of downtime and scrap variations related to different cap colors. After identifying this pattern, the customer was able to develop and implement corrective actions that significantly reduced both downtime and scrap rates.

PRODUCT CHANGEOVER IMPACTS – Multiple operating facilities recognized that certain product changeovers took longer to execute than others and that start-up times after certain changeovers also varied greatly. Despite this awareness, the root causes were never truly understood which made corrective actions elusive. Using Monitor & Report's on-demand reporting capabilities, the customer was able to identify the time required to execute specific steps in changeover processes which in turn helped identify process steps that required further evaluation. The evaluation process led directly to corrective actions that helped reduce changeover times and helped improve production scheduling sequences which also helped reduce changeover times.

Quick Read Representations of Operating Status for Key Machine Centers: Actual Machine Downtime vs. Starved vs. Blocked
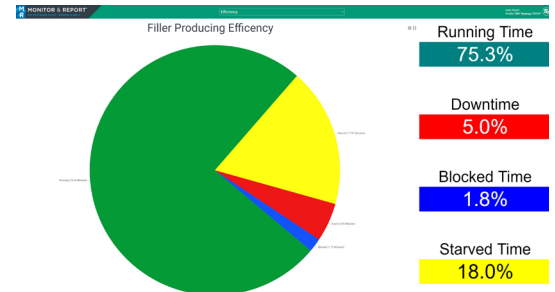
MATERIAL YIELD LOSS AND SCRAP RATES – Monitor & Report offers the capability to track real time usage of a virtually unlimited number of material inputs. When customers provide data on material purchases (caps, preforms, labels, cases, or raw materials, just to name a few) they can compare purchased quantities to actual consumption by material type. Our RTD Beverage customer has used this capability to accurately and consistently calculate yield loss by material type as well as identify losses due to shrink or obsolescence. This capability has helped the customer reduce yield losses and right-size material purchase quantities and order schedules.
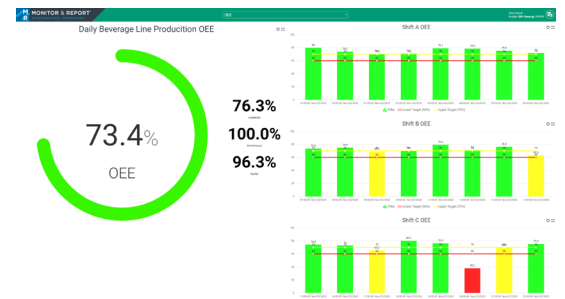
Plant End-user Feedback

Here's what plant level personnel at this customer have to say about Monitor & Report:

Quick Read Presentation of Line OEE by Production Day Including by Shift & by Hour

- Quickly identifying true root causes of lost productivity speeds-up corrective action plans which drive improved line performance
- No more debates, opinions or conventional wisdom about what is causing downtime or lost production—just real, impartial, unbiased data pulled directly from machine signals
- No more wild goose chases trying to fix problems that really aren't problems
- Operators and line leads can focus on running a line, not on collecting data
- Real time alerts generated by the system which are pushed-out to smart phones help expedite troubleshooting and problem resolution
- Dashboards and Andon displays help keep everyone focused on getting product produce
- Better understanding of line operation trends and historical performance has helped make internal maintenance processes more proactive, and less reactive
- The ZPI Monitor & Report team are technically knowledgeable about the system and how it is implemented at our facility
- Support from the ZPI Monitor & Report team is both timely and effective

The $ value of these productivity improvements was and remains significant, and as a result, Monitor & Report became a must have production line management tool for plant managers.

Results

PART II: TIME SAVINGS – AT PLANT LEVEL

- Data collection time savings for line leads and operators – Monitor & Report saved an average of 1 labor hour per line, per shift. This translated into 200 – 800 labor hours per year per plant depending on production schedules and the number of lines at the facility.

- Data tabulation and reporting for line leads and plant managers – Monitor & Report saved an average of 4 labor hours per line, per week. This translated into 200 – 300 labor hours per year per plant depending on production schedules and reporting requirements.

- When implemented at the plant level, hundreds of valuable labor hours per location could be redirected away from administrative tasks to getting product out the door. This translated into 200 – 300 labor hours per year per plant depending on production schedules and reporting requirements.

Monitor & Report Can be Accessed by Any Web Enabled Device Including Tablets, Smart Phones, Smart Watches, Laptops & Desktop Computers

Plant Level End-user Feedback

Here's what plant level end users at this customer have to say about time savings delivered by Monitor & Report:

- No more manual data collection
- No more data entry
- No more manual KPI calculations
- No more time-consuming reports to prepare
- Using a standard system is great when employees move from one facility to another—no training required—saves training time and shortens learning curves

PART II: TIME SAVINGS – AT REGIONAL & CORPORATE LEVELS

Data Consolidation & Aggregated Reporting Time Savings

- Consolidated data tabulations, once 100% manual now 100% automated
- Time savings 4 – 8 hours per week per facility

Data Auditing & Reconciliation Time Savings

- Manually collected and reported data routinely contained errors and inconsistent variable definitions from production facility to production facility

- Data auditing and reporting corrections were frequently required at the regional and corporate levels in order to produce actionable operations data

- Monitor & Report replaced inconsistent information sources with comprehensive, objective and consistent line performance data with dependable accuracy

- Time savings at regional and corporate levels estimated at 20 - 40 hours per week as required

Regional & Corporate End-user Feedback

Here's what regional and corporate end users at this customer have to say about time savings delivered by Monitor & Report:

- Having automatically aggregated, consistent and accurate attainment data for order fulfillment is a huge plus.
- Being able to easily monitor attainment trends by SKU, by production line, by plants or by region is extremely valuable.
- When problems that negatively impact attainment occur, having real time data at your fingertips means faster problem identification and faster, more effective problem resolutions.
- Who doesn't like something that makes their jobs easier?

Results

PART III: SEAMLESS DATA INTEGRATION WITH CORPORATE ENTERPRISE SOFTWARE SYSTEMS

Since commissioning Monitor & Report on the first customer production line in 1999, ZPI and the customer have worked together to ensure that the system meets and continues to meet the unique needs of every production line in every manufacturing facility.

The focus of this collaborative relationship has remained on constantly improving existing capabilities, adding new capabilities and providing custom features in order to meet the needs of a rapidly evolving business.

This tradition of strong collaboration has led to the development and creation of:

- Custom reporting formats
- Enhanced user interfaces
- New analytic tools and capabilities
- Regional and corporate reporting roll-ups
- Custom training programs and training aids

Monitor & Report Helps Accelerate the Trouble Shooting Process & the Identification of True Root Causes

In the latest collaborative initiative, a customer-ZPI team was formed to define, develop and evaluate a new capability in which Monitor & Report would automatically aggregate, format and push plant level production line data to a centralized database tied to their existing centralized, data visualization software systems.

The customer was very interested in this new Monitor & Report capability because they wanted to avoid the expense, switching costs, and disruption they would experience if they had to modify, change or replace their existing data visualization systems.

ZPI developed and tested the capability and presented it to the customer for review and comment. Based on customer input programming changes were made and the Beta version of the new system was installed and tested in several locations.

The results were favorable, and the system became a standard capability.

Based on the value created by Monitor & Report, and on the strength of the partnership, the customer will be implementing and standardizing on Monitor & Report throughout its North American production network.

Corporate Level End-user Feedback

Here's what corporate level end users at this customer have to say about the impact of seamless data integration with their existing and widely used data visualization systems:

- Satisfying our customers by delivering accurate and complete orders on time is an everyday priority in our business. This new capability helps us quickly respond to problems when they occur.
- Corporate wide access to plant level production data creates timely visibility which helps us quickly allocate and direct resources to targeted corrective actions.
- We recognized a real opportunity to use Monitor & Report data at the corporate level, but we wanted to avoid the costs, disruptions and training hassles of adapting our data visualization software to the data. ZPI helped us adapt the data to our software systems and then automatically push it to our centralized systems which saved time, money, and eliminated headaches.

Wrap-Up & What's Next?

Based on the durable value created by production line OEE improvements, time savings and expanded access to data, ZPI and the customer and ZPI will continue to work together to add additional production facilities and production lines.

We are also actively engaged in collaborative projects related to new Monitor & Report capabilities and system feature that will create additional value.

Everyone at ZPI values the strong relationship we have developed with our customer and we thank them for their business, and their continued confidence in ZPI.

Monitor & Report's features and capabilities are routinely upgraded based on user input.

ZPI develops, implements and supports software-based systems focused on improving the operation, productivity and Overall Equipment Effectiveness (OEE) of packaged goods production lines and the equipment in them.

ZPI offers three software-based productivity solutions:

- *Monitor & Report - Packaging Line Data Collection & Reporting Software*
- *Serialize & Track - Product Serialization & Tracking Software*
- *Maintain & Predict - Packaging Equipment Predictive Maintenance Software*

ZPI's digital solutions use software running on a customer's local network to communicate directly with production line equipment and control systems. Our software-based systems operate in real time to capture, aggregate and store critical production data and then support the analysis of that data to help drive performance improvements.

ZPI has distinctive expertise helping customers optimize the Overall Equipment Effectiveness of their packaged goods production lines by identifying the sources and root causes of costly downtime and lost productivity.

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