# Powerful Productivity Insights with Continuous Flow Production

A nutritional product manufacturing case study

AT-A-GLANCE
THE IMPACT OF BUSINESS INTELLIGENCE

| Changeover time improved by up to **2**40%

| Equipment uptime increased more than 60%

| Output increased up to **3**22%

| Cleaning improved by nearly 30%

| Number of downtime incidents per shift dropped by up to 50%

| Overall downtime reduced by nearly 75%
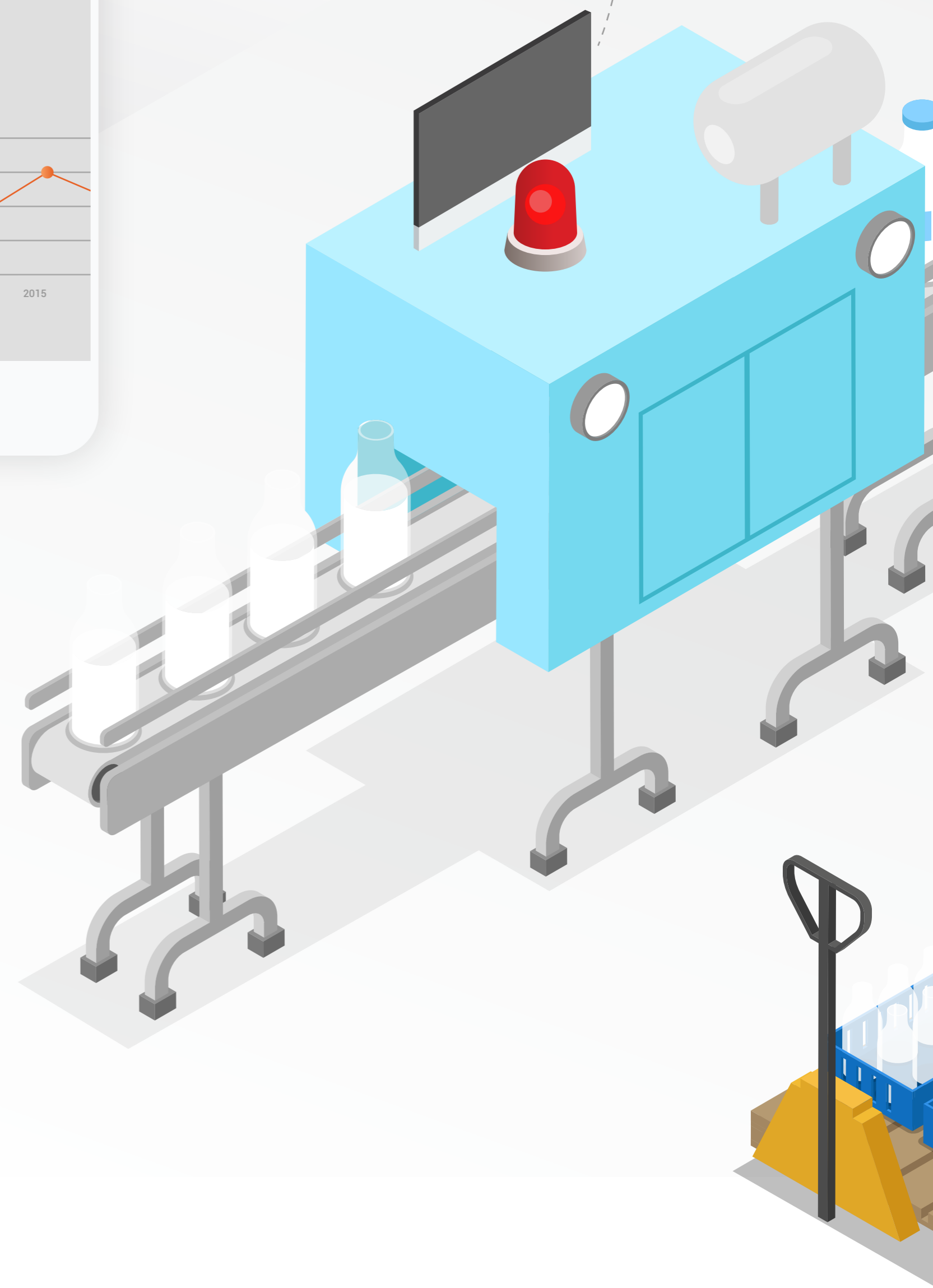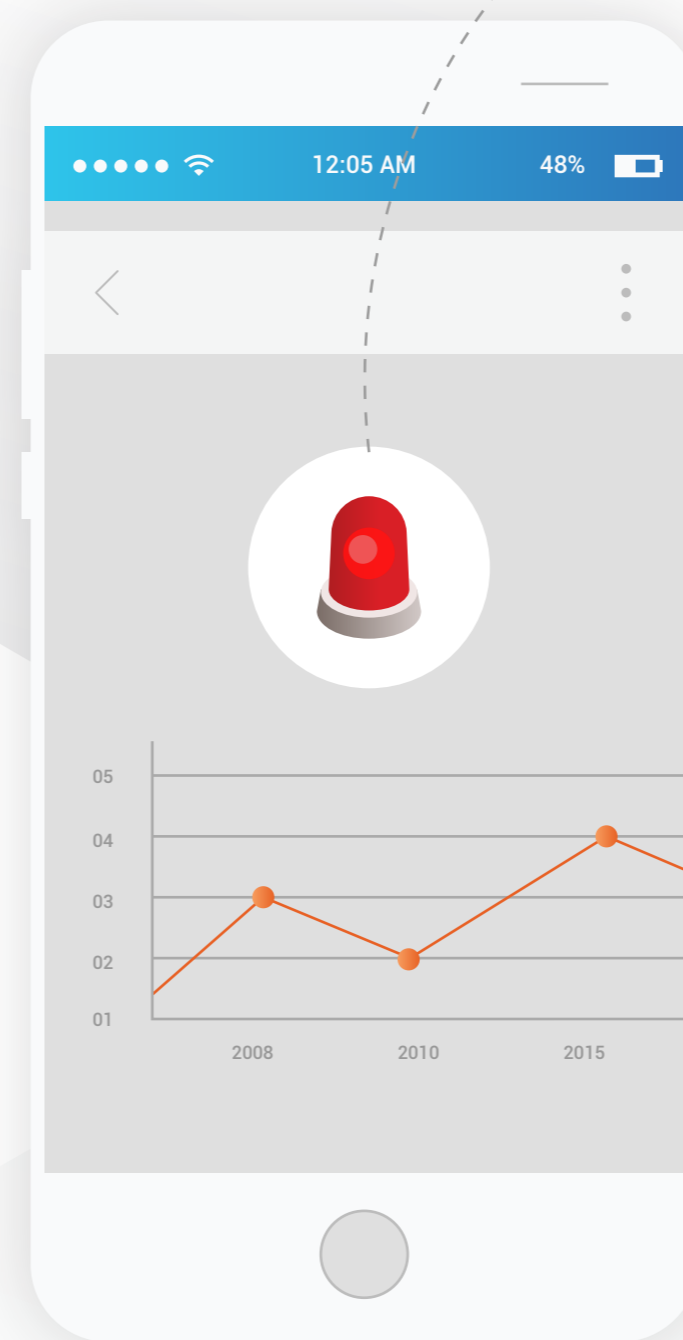
A regulated nutritional powder business had more than 2 miles of production processing equipment to make a spray-dried product. With hundreds of inputs and configuration options and each machine generating mass amounts of incremental readings, it was impossible to easily find trends or nuanced insights that could improve productivity, output, and quality.

Looking at the day-to-day output of the line was a grossly oversimplified metric that hid important underlying trends—such as shift output differences, the impact of environmental plant conditions, and more.

With productivity improvements in mind, the company worked to parse their existing data sources into actionable information and create new, simple inputs that could be gathered real-time. The results were astounding.

ACTIONABLE INTELLIGENCE ON THROUGHPUT AND OUTPUT

Existing management team data feeds were used and supplemented with additional throughput data feeds from the line equipment (gathered by installing simple load-cells on the storage silos). That information was aggregated in the data collection database. Algorithms and alerting were applied to bring out insights that weren't possible when looking at spreadsheets of raw data.

Instead of just looking at 24-hour productivity numbers, or a man-machine interface (MMI) with constantly changing throughput numbers, now snapshots of every data point were being taken at short intervals. Those snapshots were then analyzed using Artificial and Business Intelligence, creating actionable insights about the performance of the manufacturing lines.

This drove visibility into when machines hit certain levels of first-time performance—either high or low. It also was able to draw correlations between these performance levels and other systems or conditions. The team determined that if output was ±20% goal during a 15-minute period, a real-time alert was triggered so supervisors could move to that area and assess the line conditions and inputs causing this productivity event.

THE DIFFERENCE A SHIFT MAKES

The company found out that each shift did things differently—very differently—based on their team preferences. What was disguised by just looking at 24-hour productivity and output metrics was how one shift had output 30-40% higher than the next shift. The reason? As soon as the subsequent shift came on, they immediately started changing system settings to their 'preferred' operating method. They didn't know that the prior settings were optimal, or that they were impacting the overall line performance. Also, teams would change the output to compensate for breaks, staffing issues, or working conditions, rather than escalate issues around employees.

Now, if changes were made impacting the line productivity, the team immediately knew.
They also knew that if productivity stayed down for 15 minutes, the
shift supervisor would be alerted the line was down compared
to the last shift. If two 15-minute intervals continued
to show decreased productivity, the director of
manufacturing was alerted.

Because output was affected by a myriad of systems and conditions—everything from plant temperature, to production fans, to heating system efficiency—monitoring in 15-min increments allowed facility management to determine the productivity impacts of changes very quickly. And it gave management and production teams the ability to make iterative improvements with near-instant understanding of the impacts.

SIGNIFICANT PRODUCTION AND PRODUCTIVITY IMPROVEMENTS

Overall, line production improved over 40% because of the real-time output audits and alerts. Machines ran longer and when they were running, they were more efficient.

The improvements weren't confined to data and analytics though. People are an integral part of the manufacturing process. By alerting the right person, with the right—very directional—information, the employees and supervisors knew where to focus and became part of the solution too

As a result of the Business Intelligence, the company made significant improvements that directly impacted the bottom line.

- ✓ Changeover time improved by up to 40%
- ✓ Equipment uptime increased more than 60%
- ✓ Output increased up to 22%
- ✓ Cleaning improved by nearly 30%
- ✓ Number of downtime incidents per shift dropped by up to 50%
- ✓ Overall downtime duration was reduced by nearly 75%

The management team quickly came to rely on their new Business Intelligence insights to drive real-time decisions based on the live data feeds coming directly off the floor and parsed into actionable time intervals.

The improved productivity meant direct savings to the bottom line and direct growth to the top line.

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