COMPLETE DIGITAL MANUFACTURING IMPROVEMENT

LineView **20** YEARS

lineview.com

STRATEGY

EFFICIENCY

STANDARDS

PRACTICE

EXPOSE
THE HIDDEN
POTENTIAL
WITHIN YOUR
MANUFACTURING.

LineView SOLUTIONS

EFFICIENCY

Gather data automatically from machines to understand efficiency and causes of loss. Drill through your data to find root causes.

STRATEGY

Transform data into manufacturing intelligence. Correlate data from multiple sources with machine learning and AI to provide insights.

EFFICIENCY   STRATEGY

COMPLETE DIGITAL MANUFACTURING IMPROVEMENT

STANDARDS   PRACTICE

STANDARDS

Gather manual and automated data to ensure your quality, parameters and compliance requirements are to standard.

PRACTICE

Implement management routines to compliment digital data and new insights. Underpin your digital strategy with world class practices.

Timeline (Our Evolution)

LineView v1

LineView

LineView is the first fully automated line monitoring system with intelligent loss analysis
Coca-Cola Enterprises

First LineView installation
2001

Systems installed on critical lines across Europe
2005

The 'COKE WAY' is developed in partnership with our operational experts
2009

LineView Solutions incorporated as an independent software house
LineView SOLUTIONS

First web version of LineView
2010

PAN-EUROPEAN roll-out, 70 lines
2010

LineView v4
2013

Accolade Wines becomes a test site
Accolade Wines

LineView v5
2014

AB InBev roll-out begins in Mexico Installations globally will follow
2015
AB InBev

LineView Mexico & China satellite offices established. Global partner network.
2016
Coca-Cola Enterprises

Pilot on 3 lines results in roll-out at Swire Coca-Cola
Coca-Cola SWIRE COCA-COLA

Roll-out on 20 lines across Germany following pilot in 2015
2016

RapidView launched
2017

Global adoption of RapidView across Pepsico
PEPSICO

Danone partners with LineView for digital strategy
2019
DANONE

Roll-outs across CC BIG sites in Asia-Pacific
2018
BOTTLING INVESTMENTS GROUP

Business expansion with dedicated teams for primary product lines
2020+

Celebrating 20 Years of LineView
LineView 20 YEARS

OUR EVOLUTION

We add value and clarity for high-speed line operations and the people who run them, because we know the challenges first-hand.

LineView Solutions Managing Director and co-founder Ian Rowledge started his journey as a production manager at Coca-Cola Enterprises. At the time, he was grappling with how difficult it was to identify key issues with no real data: that it was impossible to know the true cause of loss in a production system without great data. After putting in long hours one weekend in an attempt to find true causal loss and finding that they were back to square one on Monday, Ian decided that enough was enough.

Ian worked in tandem with John Dunlop, then technical service provider to Coca-Cola Enterprises, to develop a software solution that became much more than a line monitoring tool: LineView line information system was born.

LineView's advanced logic provided an automatic, real-time data gathering tool that accurately categorised data and presented it

in exactly the way operators and managers needed it. Coca-Cola Enterprises sites saw remarkable improved performance post the installation of LineView™ and as a result, LineView grew rapidly. First alongside Coca-Cola Enterprises, and then other industry giants.

Since our early days as line monitoring solution, we've worked alongside global manufacturers to gain a deep understanding of their specific business drivers — expanding the capabilities of our solution and our team to stay ahead of the complex new data and integration challenges.

Through the course of two decades, LineView's ultimate goal has remained the same: complete digital manufacturing improvement through better information, better focus and better resolutions. We add value and clarity for high-speed line operations and the people who run them, because we know the challenges first-hand.

WHAT TO EXPECT

- Cost Avoidance & Lower Cost Per Unit
- Business Efficiencies with OEE% Gains
- Higher Operational Capacity
- Strategic Operational Focus
- Senior Management Up-skilling
- Digitised Standards and Quality Checks

PROVEN RESULTS

1. Efficiency improvements up to 20% < 24 months
2. Average improvement of 6% across installations
3. ROI on logistics-based savings alone
4. Consistent yield and quality improvements

LINE EFFICIENCY, 24 MONTHS
PERCENTAGE %
LineView

YTD J F M A M J J A S O N D YTD J F M A M J J A S O N D

FACTORY OF THE FUTURE

I hear a lot in our industry about a fabled factory that runs autonomously with insight gleaned from the most robust AI. It's a shiny image with VR goggles - we've all seen the stock photos that are ubiquitous in manufacturing magazines.

For those of us that have paved the road for this vision, we know this reality is difficult to achieve. More data doesn't always yield more insight and data systems don't always integrate perfectly in the real world. Humans aren't going anywhere, though the required skills for our roles will certainly change.

The past twenty years, the age of LineView and coincidentally also Amazon, have been a journey towards that destination and while we're not there yet, we are within reach of a version of this factory we refer to as the 'Factory of the Future'.

Allow me to start at the beginning and share not only our vision, but a realistic way to achieve it.

I started my career at Coca-Cola and have since worked alongside hundreds of operations teams in packaging and FMCG companies. My personal passion and the driving force behind LineView is helping teams glean better insight from their manufacturing data, to take action, and therefore produce better results.

Our core focus at LineView has been line monitoring and OEE. Successive iterations of our original system have helped teams find and close the gap in their performance. We drill down to actionable information, providing focus and then actions to move the needle from where the performance is, to the intended result. Our purpose-built tactical software solution paired with operational excellence know-how has helped us realise an average of 7% efficiency gains for packaging operations we work with.

Innovation has come from seeing and doing on our part and that of the teams we work with. For instance, CamView has grown from a need to record machine faults in real-time so that operators can replay without standing at the line trying to catch the event or instance. DigiView was developed so that routine processes could be captured and recorded in absence of another system to do so.

These tactical innovations and other digital manufacturing technologies have paved the way and opened our minds to a more strategic scope.

What if a specific SKU could be produced to exact specifications at an optimal speed with every parameter optimised, from the temperature of the glue adhesive to the lubrication of the critical machine? It's not fiction, we have the technology and knowledge to provide this complete digital manufacturing solution.

We can provide more insight by combining tactical information, both real-time and historical, that is gathered and formatted through a gateway to allow stream analytics and strategic insight from a BI tool. Artificial Intelligence and machine learning can be applied to understand the effects of various parameters, fault data, condition-based monitoring, environmental and quality data.

We're tackling a full digital optimisation process to find correlations without data mining and analysis.

The goal is helping our customer to predict failures more frequently, to predict forecasts more closely and accurately, to predict even behavioural elements like the profile of shift teams that perform best – or which changeovers can be improved.

We will continue to gather data automatically from machines to understand efficiency and causes of loss. We will continue to complement this with in-depth analysis of other tactical elements such as line balance optimisation, CIP monitoring and energy loss alongside compliance requirements, even maintenance and lubrication schedules.

Combining this insight through EnterpriseView, our strategic BI tool will correlate this data automatically to provide insights. Artificial Intelligence will shortly suggest potential actions, provide guided interventions and more insightful forecasts for better outcomes.

Of course, we won't leave you alone in the continuation of this manufacturing improvement journey. Our operational excellence practice provides the methodologies and guidance to ensure the full suite is maximised.

Like the gains we have realised thus far as an industry, this transition won't happen overnight or without effort – but it is realistic.

A few weeks back, I found the hand-drawn 'vision' of the LineView system I had conceived before we ever started development of the solution. It's colour-coded and not nearly as sophisticated as the solution you can use today. It makes me question what we will think twenty years from now as we read this article outlining the first real steps towards the 'Factory of the Future'.

By Ian Rowledge
Director/Owner

Ian specialises in helping manufacturing businesses eliminate the greatest causes of productivity loss through a combination of proven processes and operationally-focused software solutions that he has developed jointly with the LineView and i3Group teams.

Are traditional MES and historians the future?
MEET THE FUTURE OF MANUFACTURING INSIGHTS

OEE is just the start.

The evolution of manufacturing KPIs provide a deeper understanding and application of true causal loss

Imagine a production environment that's optimised for every parameter for every SKU

Total digitisation is the enabler of a more efficient shop floor that is driven by machine learning and AI

FOCUSED AI
Never before possible, artificial intelligence combined with 20+ years of line monitoring insight enables your team to focus on what's important

POWERFUL CORRELATION
In a 100% digital environment, every element of the process can be searched, mined for insight and correlated for previously hidden opportunities

PROACTIVE, NOT REACTIVE
No longer need to view and interpret the data, the system will provide insights, alerts and recommended actions to optimise your performance

Best of breed - a truly open, flexible system that's future-ready.

Our approach to complete digital manufacturing improvement is more than a single KPI, it is a new way of thinking about your manufacturing intelligence. We use best of breed software and systems that are open and flexible. Constantly evolving, this method reduces risk - moving toward a low-code, no-code ecosystem that's plug and play.

COMPLETE DIGITAL MANUFACTURING IMPROVEMENT

Opening the door to smart, practical AI applications

Implementing artificial intelligence on the shop floor isn't all or nothing. These practical applications are a great starting point for machine learning technologies.

ABNORMAL MACHINE PERFORMANCE ALERT -
Use Machine Learning AI to detect when a machine starts performing differently as versus 'normal' and send an alert.

GUIDED INTERVENTIONS -
Predict where the greatest area of loss is likely to be in the coming 4 hours. This allows a predictable impact on ongoing performance. A very effective resource allocation method for technicians and team leaders.

AGILE PLANNING -
Most plants plan schedules based on fixed line efficiency. This can cause inaccuracies of 2.5-4 hours difference per day with 10-15% variation between plan and actual output. Agile planning using machine learning AI algorithm will more accurately predict the most likely outcome for each production order start and finish times.
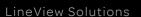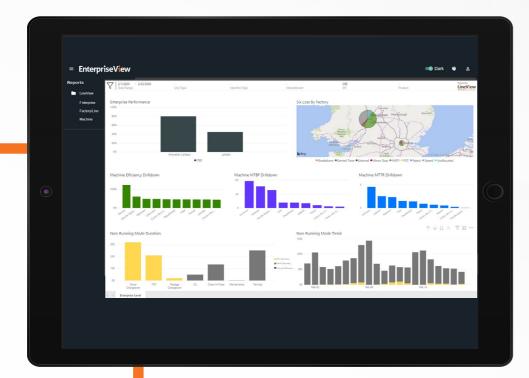
TRANSFORM DATA INTO
MANUFACTURING INTELLIGENCE

Transform data into value with EnterpriseView, a complete Business Intelligence toolset to create context in manufacturing data and analysis. EnterpriseView is future-ready for AI insights and with a reporting suite to achieve today's manufacturing objectives.

Use advanced reporting and feature-rich capabilities like SQL data extracts to extract data into your environment and filters like machine OEM for additional insight. Pair with DigiView to incorporate enterprise-wide standard adherence.

EnterpriseView is built upon the know-how and experience of LineView's operational experts with optimised reporting processes to acheive your operational goals and outcomes.

Ingest enterprise-wide data into the cloud to create a structured dataset for analysis

Integrate a future-ready BI suite designed for Artificial Intelligence-powered insight

Identify optimisation and improvement opportunities at every level of the enterprise

EnterpriseView

Includes	Premium Features
REPORTS BUILDER	ADD-ON DATA REQUESTS*
MOBILE APP	ALERTS*
BI DASHBOARDS	AI INSIGHTS*
MIVIEW	PREDICTIVE FOCUS*
-QCDM	- OPTIMISED PLANNER
- ACTION TRACKER	- Q&A BOT
	ENERGYVIEW*

Determine which line is causing the most impact vs business targets and what main areas of loss should be the focus

Identify which brand of a particular machine type performs best on a individual product type

Compare the performance of similar lines across the enterprise

Identify overrun availability loss relating to planned stoppages such as changeover or maintenance

Filter data by shift or operation team to identify inconsistences

Analyse product rejects down to individual reason type

EFFICIENCY

ALWAYS RUN
IN AN
OPTIMISED
STATE

More than just OEE - robust efficiency KPIs and algorithms to unlock hidden efficiencies

Automatically correlate machine-level faults to real impact and optimise parameters

Average uplift of 7% in performance, 6 months after implementing LineView™

LineView

Fully integrated line information system, instantly identifying the highest impact opportunities for targeted productivity gains

- Integrated monitoring and analysis with live trending
- Comprehensive reporting suite with ready-to-use reports
- Powerful True Causal Loss and -6 Loss insight
- Modular and scalable solution for roll-out success

> **BEST FOR**

Intelligence on lines with interdependent machines
Automated True Causal Loss
Targeted, actionable OEE insight

Includes	Premium Features
FACTORYVIEW	CIP
TACTICAL REPORTING	LBO (LBOM, LBOC)
	CAMVIEW
	PARAMETERS
	ERP/SAP CONNECTOR
	MEETINGS (SIC)

RapidView

Rapid manufacturing intelligence delivered in rugged, IP rated hardware.

- Rapid analysis and visibility of top losses
- Portable system with setup in < 2 hours
- Built-in tactical reporting
- Zero impact - independent of existing infrastructure
- Wireless data capture via battery-powered sensors

> **BEST FOR**

Instant data gathering & visualisation
Troubleshooting
CI initiatives

Includes	Premium Features
TACTICAL REPORTING	CAMVIEW
	MEETINGS (SIC)

PRACTICE

WHAT IS THE IFA METHODOLOGY?

IFA is our core manufacturing improvement methodology. It's so simple to use it can be applied to any situation. It's a methodology that is proven to work and has helped numerous clients achieve world class OEE.

OPERATIONAL SUPPORT

Reliable production data and an understanding of losses is a great place to start; however, proven routines maximise results and ROI.

INFORMATION

Accurate & Actionable
Real-Time & Historical
Causal & Drill down

Do we have the right data?

FOCUS

Management routines
Leadership buy-in
Effective decision-making

Are we using data in the best possible way?

ACTION

Targeted activity
Pro-active improvement
Forward-focused

Are the actions we are taking effective?

RESULTS

Step change
Continuous improvement
Sustainable benefits

PARTNERS IN THE FUTURE OF MANUFACTURING

When you engage LineView's Operational Support team, we ensure core competencies are measured and improvement towards excellence is tracked across all success factors. Whether your team is utilising LineView to solve today's problems on the shop floor or undertaking an enterprise-wide digital transformation project, our team is ready to work alongside your team in a parfect partnership.

COMPLETE DIGITAL MANUFACTURING IMPROVEMENT

PRACTICE

Governance

IFA

Short Interval Control

Routines

IFA

OPERATIONAL SUPPORT SERVICES:

> Operational Audits
> IFA Methodology
> Governance Tool
> Management Meetings

> Lean and Continuous Improvement
> OEE Improvement
> Line Balance Optimisation
> Installation and Implementation

WE THINK IN ECO-SYSTEMS.

We don't believe that success comes silos. Collaborations within a well thought out ecosystem leads to joint success.

Our contribution is a a best in class software suite with a team of practitioners to implement our proven approach to manufacturing improvement.

With our insights, IFA methodology and trusted partner eco-system - we work alongside our team and other contributors to maximise your manufacturing efficiency.

ECO-SYSTEM PARTNERSHIPS:

✓ Technology development partnerships
✓ Best-in-class integrations
✓ International delivery to serve you locally

100% DIGITAL PROCESS -
INCLUDING QUALITY AND COMPLIANCE

DigiView

Transform production checks from spreadsheets into a digital, Industry 4.0 ready process.

- ✓ Instant performance feedback
- ✓ Easily configurable checks, including operator alerts
- ✓ Enterprise-wide traceability
- ✓ Tactical and strategic analysis

❯ **BEST FOR**

Going paperless,

Digitising manual checks

Validation of adherence to standards

User configurable checks

Applications
SAFETY
QUALITY
ENERGY
COMPLIANCE
GMP/5S
CLEAN/LUB/INSP
PEOPLE

ENTERPRISE-WIDE DATA VISIBILITY

✎ Digital logbooks, quality checks and other operator inputted data

▮ Energy inputs, clean-in-place and other plant-wide parameter inputs

▤ Unified database and open API

✕ Complete digitisation and traceability

PROVEN AT TOP BRANDS
AROUND THE WORLD

From multi-national enterprises to single site operations, the best in the industry rely on our solutions.

North & South American Installations:

1. AB InBev
2. PepsiCo
3. Grupo Modelo
4. Compania Cervecera Ascuncion S.A

Asian, Asian Pacific & Australasian Installations:

1. AB InBev
2. Danone
3. Olympic Brewery
4. DB Breweries
5. Thai Asia Pacific Brewery TAPB
6. Carlsberg
7. Swire Coca-Cola
8. Delegat Wines

European, Middle-Eastern, & African Installations:

1. Coca-Cola European Partners
2. Coca-Cola Sabco
3. AB InBev
4. PepsiCo
5. Accolade Wines
6. Carlsberg
7. G&J Greenalls
8. Diageo
9. Greene King
10. Interbrand

☐ LineView HO & satellite offices

WHAT OUR CUSTOMERS LOVE:

1 Single source of truth.
Many of our clients eliminate other systems.

2 Low maintenance.
Our clients appreciate unlimited user seats, with no data tags and low annual fees.

3 Flexibility.
Our modular systems range from turnkey to assisted solutions - only buy what you need.

4 Minimal interuption.
Where possible – our clients use their existing KPI terminology and hardware.

5 Valuable data.
Our clients comment that we 'deliver a working system that serves the most valuable data.'

LineView Solutions' industry leading LineView line monitoring software system was jointly developed with OptimumFX, operational excellence practitioners, and Bytronic Automation – a leading manufacturing systems development and integration specialist. Together we offer a unique service proposition known as the i3 Group.

The combined service offering of the i3 Group delivers complete manufacturing improvement.

LineView SOLUTIONS

CONTACT

Innovation Campus, 33 Greenhill, Blackwell, B60 1BL UK

P. +44 1564 793039

E. enquiries@lineview.com

lineview.com

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