

Be smart factory ready.

ITI Group's Digital Manufacturing solutions deliver value and ROI to manufacturing clients worldwide.

Operational efficiency

>20% OEE improvements.
$400k pa cost savings.
1.3m units pa increased production.

Quality

$360k savings in 6 months from reduced product waste.

Energy & environment

5% energy cost reduction.
11 tonnes reduced plastic waste.
136 tonnes reduced cardboard waste.

Maintenance & downtime

Reduced support costs through improved data accuracy, efficiency and communication.

be ready

Are you ready?

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be smart factory ready

Digital readiness assessment

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Digital readiness assessment



ITI Group's data-driven technology enables manufacturers to deliver smart, efficient processes and facilities.

We deliver value-led technology solutions to improve productivity and performance, achieve quality compliance, manage capacity and labour challenges.

Enhanced operational efficiency
Real-time monitoring for optimal production performance.

Predictive maintenance
Anticipate equipment failures before they occur.

Quality control
Ensure consistent product quality with real-time data.

Inventory management
Track and manage inventory levels accurately.

Energy management
Optimize energy usage across manufacturing processes.

Production scheduling
Streamline production schedules for maximum efficiency.

Supply chain visibility
Gain insights into supply chain operations.

Remote monitoring
Track operations from anywhere, anytime.

Compliance management
Ensure adherence to industry regulations.

Resource optimization
Maximize utilization of materials and labor.

Waste reduction
Minimize production waste and inefficiencies.

Environmental monitoring
Monitor and control environmental impact.

Traceability
Track product history and origin seamlessly.

Downtime reduction
Minimize unplanned downtime with proactive measures.

Be smart factory ready.

Digital readiness assessment: how it works

Digitizing your manufacturing processes can seem complicated and invasive—but ITI Group can help you navigate your smart factory journey.

Identify focus areas
Share your challenges. Engage with our industry experts. Let us know your priorities, or we can recommend a starting point.

1

Site visit
We'll come to your plant and perform an assessment; review your processes and procedures and explore opportunities to enhance efficiency and productivity.

2

Digital readiness report
We'll report on what we saw, offer expert insights, and highlight priority areas.

3

Downtime impacting profit

Maintenance delays production

Quality issues

Visibility and track & trace



Production Output and Capacity:

- Data showed an average output of 1,000 tons/month of biopolymer pellets across January and February, consistent with the lowa plant's 12,000-ton annual capacity (packaging line contributes ~60% of this). However, daily production logs fluctuated between 30–35 tons/day, indicating inconsistent throughput.

Downtime Analysis:

- Total downtime averaged 24 hours/month, with logs detailing 12 hours due to equipment failures (e.g., pump failures) and 8 hours attributed to "process issues" (e.g., need for manual recalibration). An additional 4 hours were allocated to "unplanned maintenance." A spike on February 10 showed a 6-hour stoppage due to a pump failure, costing an estimated $60,000 in lost production at $10,000/hour.

Defect Rate Trends:

- Quality repor
issues (e.g., ir
pellets, with
contributing ar

Energy Consumption I

- Energy logs sh
breakdown re
periods, sugg
for similar lin

Process Timing and Va

- Fermentation
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ideal range o
hours. Autom

Maintenance and Equ

- Maintenance
degradation i
maintenance
each.

Operator Overrides ar

- Operator logs
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control repor

Cost Breakdown:

- Financial exp
down vs. $300
$25/hour), $1
$100K for def

OEE Estimate:

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1 Problem Statement

1.1 Introduction

During our site assessment on March 20, 2025, at InGen's Iowa facility, we identified several critical inefficiencies in the biodegradable packaging material production line, which currently produces 1,000 tons of biopolymer pellets per month. These issues are hindering the plant's ability to meet its strategic goal of achieving a $1 billion valuation by 2027 and threaten its operational sustainability. The following problems were observed:

- **High Downtime (24 Hours/Month):** The production line experiences an average of 24 hours of unplanned downtime each month, primarily due to equipment failures (e.g., bioreactor pump failures) and manual recalibration delays. This downtime translates to an operational loss of approximately $240,000 per month, significantly impacting overall production efficiency and reducing availability and contributing to an estimated Overall Equipment Effectiveness (OEE) of 65%.
- **Defect Rate (5% or 50 Tons/Month):** Approximately 5% of the output (50 tons) is defective, attributed to inconsistent microbial fermentation conditions. We noted subtle process nuances during the assessment, such as agitation speed variations (200–210 RPM) and nutrient feed timing lags (30–40 minutes), which directly correlate with these defects and result in significant material and customer pallet quality. The results in a $500,000 monthly loss at a market value of $2,000/ton.
- **Manual Process Reliance:** The facility relies heavily on manual data logging and operator adjustments, leading to untracked inefficiencies. For instance, temperature probes on bioreactor walls misread by 2°C, affecting the ideal 37°C fermentation environment, while filter membrane wear (replaced every 3 months vs. the 6-month OEM recommendation) goes unnoticed. Additionally, operator overrides are not logged, obscuring error patterns and complicating root cause analysis.
- **Data Silos and Lack of Real-Time Insights:** Current systems (e.g., legacy PLCs and ERP) lack integration, preventing real-time visibility into production metrics. During the visit, we observed that batch traceability for regulatory compliance (FDA/EU standards) relies on paper records, delaying quality reviews by 24–48 hours and increasing the risk of errors.
- **Energy and Cost Inefficiencies:** The line consumes 1,200 kWh/day, with visible energy waste in bioreactors and greenhouses due to manual settings. This contributes to a high production cost of $950/ton ($190,000/month, including $140K for 500 tons of nutrients, $40K in wages, $15K maintenance, $144K downtime, $100K defects), exceeding the industry average of $650/ton by $145/ton.

These problems collectively erode InGen's profitability (15% margin) and scalability, placing it at a competitive disadvantage against industry leaders like BioTech Corp, which reportedly achieves an 85% OEE. Without intervention, the current state jeopardizes InGen's ability to double output to 2,000 tons/month at Iowa and secure additional investment. Addressing these issues through digital solutions and IoT is critical to achieve these goals, optimize processes, and align with the $1 billion valuation objective.

2 Pre-Visit Documentation Review

The pre-visit data review revealed systemic inefficiencies in InGen's Iowa packaging line: 24 hours/month downtime, 5% defects, and a $795/ton cost driven by manual processes, data gaps, and lack of predictive maintenance. Variability in agitation (200–210 RPM), nutrient timing (4.5-hour average), and temperature misreads (2°C) directly correlate with output losses, while energy waste (1,200 kWh/day) and compliance delays (2 days) add to costs. The 65% OEE underscores the need for MES/IoT to achieve the 85% benchmark, supporting InGen's $1 billion valuation goal.

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Don't delay digital. The right time is right now.

Digital readiness assessment: what it covers

We want to give you a tool to help drive investment in Digital initiatives.

What does a high-level ROI look like?

How are existing systems really used?

Where is our bottleneck?

What is the growth potential?

Are we ready for digital? What do we need?

Are we producing actionable insights?

Do we have good insights on quality?

How can digital solutions make you more productive?

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