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These examples illustrate the structure, depth, and type of output produced during a Phase 1 diagnostic. They are anonymised and provided to support decision-making — not as case studies or endorsements.

Food Manufacturing: Smart Factory & Analytics Scope Assessment

Independent Assessment for Multinational Multi-Plant Operations

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Background Context

The organisation was a multinational food manufacturer producing cereals and other staple products across multiple plants and distribution centres. **The industry** — large-scale food manufacturing — operates under tight retailer service level agreements, commodity-sensitive input costs, and continuous pressure on margin and sustainability. **The operational size** involved multiple production lines per factory, continuous and batch-based manufacturing, and national and export distribution networks.

Operations were complex:

- Multiple production lines per factory
- Continuous and batch-based manufacturing
- National and export distribution
- Tight retailer service level agreements
- Commodity-sensitive input costs (grain, sugar, packaging)

The governance condition was central to the engagement. A major programme was underway to modernise reporting by migrating core ERP data into a consolidated analytics environment. External data consultants had been appointed to support the transition from SAP into a cloud-based data warehouse.

The original mandate was focused:

- Standardise financial reporting
- Improve supply chain visibility
- Support executive reporting

Midway through the engagement, the consultants presented an additional proposal.

They identified what they described as a "Smart Factory opportunity" — capturing machine-level data directly from production lines to analyse idle time, energy consumption, production bottlenecks, and environmental impact. They argued that significant cost savings and sustainability gains were possible if idle production lines were identified and optimised.

The executive team asked a disciplined question:

> "Is this a legitimate strategic opportunity — or scope expansion driven by consulting incentives?"

An independent data strategy advisor was engaged to evaluate the proposal objectively.

Executive Summary

This document summarises an independent assessment of a Smart Factory analytics proposal in a multinational food manufacturer. The organisation was mid-way through an ERP-to-analytics migration when consultants proposed extending scope to capture PLC machine data for idle detection, energy analytics, and sustainability reporting. The assessment did not evaluate technical feasibility; it examined five strategic questions: whether idle production was a material financial problem, whether governance over production data existed, whether centralised visibility would improve operational authority, whether investment sequencing was appropriate, and what the opportunity cost would be. The conclusion was that the Smart Factory concept was legitimate in principle, but enterprise definitions of production states were not harmonised, idle energy cost was not proven material, and core financial and supply chain data governance remained incomplete. The advisor recommended a staged approach: quantify idle cost using existing data first, establish enterprise definitions for production states, stabilise ERP foundations, and pilot in one plant before enterprise rollout. The proposal was credible — but timing and scope expansion also served the consultant's commercial interest. Without independent evaluation, the organisation risked layering advanced analytics on unstable foundations.

Executive-Level Assessment Dimensions

The assessment is framed around five key dimensions:

- **Executive level pattern** — Clarity on which analytics opportunities, if pursued prematurely, would consume resources without proportionate decision impact
- **The organisation** — Authority structures: who has power to act on centralised production analytics, and whether local plant context is understood
- **The industry** — Manufacturing analytics trends, sustainability commitments, and commodity cost volatility relative to operational efficiency gains
- **The operational size** — Multi-plant, multi-line environment where definitions and practices vary by site
- **The governance condition** — Harmonised production state definitions, ERP-to-analytics maturity, and foundational data integrity before advanced use cases

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The Scenario

The Smart Factory Proposition

The consultants framed the proposal around three claims:

1. Production lines were occasionally left running while not actively producing output.
2. Energy consumption during idle states created unnecessary cost and environmental impact.
3. Real-time analytics could identify and reduce this inefficiency.

The proposed approach:

- Integrate PLC machine data from factories
- Centralise production telemetry
- Build analytics to quantify idle states
- Enable operational decision-making

The potential upside: - Reduced electricity costs - Lower carbon footprint - Improved production efficiency

The board's concern was not conceptual validity. It was sequencing and proportionality.

The Independent Diagnostic Approach

The advisor did not evaluate the technical feasibility of machine integration.

Instead, the review focused on five strategic questions.

1. Is Idle Production a Material Financial Problem?

Before integrating machine telemetry, the advisor asked:

- What percentage of plant-level energy cost is attributable to idle running?
- Is idle time already monitored locally?
- Have prior internal reviews quantified this issue?

Findings:

- Idle energy consumption existed.
- However, its contribution to overall manufacturing cost was modest relative to commodity price volatility (grain, sugar, packaging).
- Some plants already used local dashboards to monitor downtime.

The issue was real — but its financial magnitude required validation. Implementing enterprise-level Smart Factory analytics without first quantifying idle cost from existing plant data would be speculative.

Key question: Is idle detection a material lever, or a marginal optimisation in a cost structure dominated by inputs?

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2. Is There Governance Over Production Data Today?

Machine data already existed within factories:

- PLC logs
- Maintenance records
- Downtime tracking
- Shift performance reports

However:

- Definitions of "idle" varied across plants.
- Some plants categorised changeovers as idle.
- Others classified them as planned downtime.

Without harmonised definitions, enterprise-level comparison would create misleading conclusions. A plant with "strict" idle definition might appear inefficient; one with "lenient" definition might appear efficient — with no true like-for-like basis.

The advisor identified a governance gap:

> No enterprise-wide standard for production state classification existed.

Implementing a Smart Factory analytics layer without first defining state logic risked amplifying inconsistency rather than illuminating it.

Key question: Can we compare plants reliably before we agree on what we are measuring?

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3. Does Centralised Visibility Improve Operational Authority?

Production lines were managed locally by plant managers.

The advisor examined:

- Who had authority to stop a line?
- What contractual or safety constraints applied?
- Were idle states operationally necessary (e.g., temperature stabilisation, product quality requirements)?

In several plants, so-called "idle" states were safety or quality requirements — not inefficiency. Central analytics could highlight idle time, but local context determined legitimacy.

The strategic question became:

- Would central reporting create accountability, or friction?
- Would plant managers receive actionable insights — or defensive pressure from headquarters?

Key question: Does central visibility change behaviour in a helpful way, or does it create conflict without resolving it?

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4. Is This the Right Sequence of Investment?

The ERP-to-analytics migration was not yet complete.

Key supply chain and financial metrics were still being stabilised.

The advisor challenged sequencing:

- Are executive decisions currently constrained by lack of machine telemetry?
- Or are higher-priority data foundations still maturing?

The review found unresolved issues in:

- Inventory reconciliation
- Production-to-finance cost alignment
- Waste attribution

These had clearer margin impact than idle line detection. Commodity cost movements and waste reduction typically outweigh incremental energy savings from idle optimisation.

Key question: Are we solving the right problem at the right time?

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5. What Is the Opportunity Cost?

Smart Factory integration required:

- Factory engineering involvement
- Change management across multiple plants
- Data modelling and integration resources
- Ongoing governance of production state definitions

The board needed clarity on:

- Expected return versus implementation burden
- Whether this diverted focus from higher-impact analytics use cases (e.g., supply chain, cost attribution, waste)

Key question: What do we not do if we do this?

Findings

The independent assessment concluded:

What was valid:

- The Smart Factory concept was legitimate in principle.
- Idle detection analytics could produce efficiency gains.
- Environmental reporting value aligned with corporate sustainability commitments.
- The proposal aligned with broader industry trends in manufacturing analytics.

What was concerning:

- Enterprise definitions of production states were not harmonised.
- Idle energy cost was not yet proven to be materially significant relative to commodity and waste.
- Core financial and supply chain data governance remained incomplete.
- The proposal represented scope expansion beyond the original mandate mid-engagement.

The risk was not that the idea was flawed.

The risk was premature scaling — layering advanced production analytics on foundations that were not yet stable.

The Strategic Recommendation

The advisor recommended a staged approach:

Phase	Action	Rationale
1	Quantify idle cost using existing plant-level data before new integration	Validate financial materiality before investment
2	Establish enterprise definitions for production states and downtime categories	Enable like-for-like comparison; prevent misleading analytics
3	Stabilise ERP-to-analytics foundations	Complete inventory, cost alignment, waste attribution before adding complexity
4	Pilot Smart Factory analytics in one plant before enterprise rollout	Controlled validation; learn before scale

This reframed the proposal from an **enterprise programme** to a **controlled validation**.

Legitimate Opportunity or Revenue Expansion?

The final view was balanced:

In favour of legitimacy:

- The consultants had identified a credible opportunity.
- Idle detection and energy analytics are established use cases in manufacturing.
- Sustainability reporting is a growing board and investor priority.

In favour of caution:

- Timing (mid-engagement) and scope expansion served the consultant's commercial interest as well as the client's potential benefit.
- Without independent evaluation, the organisation risked approving an attractive-sounding proposal without proportionate scrutiny.
- Analytics opportunity is rarely scarce in large manufacturers; clarity on priority is.

The advisor did not reject innovation. It ensured that innovation was **sequenced**, **proportional**, and **aligned to decision impact** rather than momentum.

Success Metrics (If Proceeding)

Pre-Integration (Months 1-3)

1. **Idle Cost Quantification**: Using existing PLC and energy data, establish baseline idle energy cost as % of plant energy spend and % of total manufacturing cost
2. **Definition Harmonisation**: Enterprise production state taxonomy agreed; all plants map local categories to standard
3. **ERP Foundation Sign-Off**: Inventory reconciliation, production-to-finance alignment, and waste attribution stable and signed off by finance and operations

Pilot Phase (Months 4-6)

1. **Single Plant Pilot**: One plant integrated; idle analytics live; local plant manager confirms utility and actionability
2. **Return Validation**: Quantified energy savings and/or carbon reduction from pilot; compared to implementation cost

Enterprise Rollout (Months 7+)

1. **Controlled Rollout**: Remaining plants integrated only after pilot success and governance stable

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Risks & Mitigation

Risk 1: Governance Paralysis

Problem: Pursuing perfect production state definitions delays any analytics; plants resist standardisation.

Mitigation: Start with minimum viable taxonomy (e.g., Producing / Idle / Planned Downtime / Unplanned Downtime); refine iteratively. Pilot plant co-defines with central team.

Risk 2: Pilot Becomes Default Enterprise Solution

Problem: Pilot succeeds; pressure to roll out without completing ERP foundation or definition harmonisation.

Mitigation: Define explicit go/no-go criteria for enterprise rollout. Require sign-off on foundations before scale.

Risk 3: Central Reporting Creates Friction

Problem: Plant managers feel monitored without support; defensive behaviour; data quality suffers.

Mitigation: Design analytics to support local decision-making first; central visibility as secondary. Include plant managers in design; frame as "enable" not "police".

Takeaway

In large multinational manufacturers, analytics opportunity is rarely scarce.

Clarity on priority is.

Smart Factory initiatives can unlock value — but only when:

- **Definitions are governed** — Enterprise production state taxonomy exists before integration
- **Financial materiality is validated** — Idle cost quantified from existing data before new telemetry
- **Authority structures are understood** — Who acts on the insight, and does central visibility help or hinder?
- **Foundational data integrity is established** — ERP, supply chain, and cost analytics stable first

The independent data strategy advisor did not reject innovation.

It ensured that innovation was sequenced, proportional, and aligned to decision impact rather than momentum.