

Improving Production Visibility, Resource Utilization, and Cost Accuracy

Digital Twin of an Organization (DTO) powered by Collaborative Business Planning (CBP)

Business Context

Surrette Battery Company Limited is a Canadian industrial manufacturer specializing in deep-cycle batteries for renewable energy storage, rail, and material handling applications. Operating a complex production environment with multiple work centres and both automated and semi-automated processes, Surrette sought to improve operational visibility and decision-making at its main production facility.



Like many industrial manufacturers, Surrette faced challenges with:

- Limited visibility into detailed work centre activities and process flows
- Inconsistent labour standards and unclear resource utilization
- Data quality issues across ERP and manual data collection processes
- Difficulty quantifying the impact of process improvements before implementation

These constraints created a need for a more integrated, data-driven planning capability.

Key Problem Statement

Surrette lacked a unified model to:

- accurately represent production resource requirements (labour, equipment, facility)
- quantify resource utilization and identify inefficiencies as optimization targets
- evaluate process improvement opportunities with confidence

CBP-DTO Solution Approach

Surrette implemented a **Digital Twin of the Organization (DTO)** using **Collaborative Business Planning (CBP)**, supported by the **QualiWare** platform, in a phased modeling approach:

- Phase 1: Front-end processes (lead oxide production, grid casting, plate pasting)
- Phase 2: Large industrial battery production (enveloping, casting, charging, assembly)
- Phase 3: Smaller monoblock battery production (Dynamac, waterbath) and plant-wide material flow including material handling, shipping and receiving

Data Integration included ERP (Syspro), Excel-based resource plans, and shop-floor interview, logs and observations.

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Key Capabilities Enabled by CBP

- **End-to-End Operational Visibility**
Single integrated model of production, support activities, and operational flows
- **Granular Labour and Resource Modeling**
Detailed analysis of hands-on processing times for over 200 unique process activities
- **Data Quality Validation**
Reconciliation of modeling flows (demands > processes > resources) with ERP data
- **Constraint-Based Planning**
Identification of bottlenecks across labour, equipment, and production lines
- **Scenario Simulation**
Evaluation of CI initiatives, staffing changes, and production adjustments before execution

Quantified Business Benefits

Operational Efficiency

- Improved visibility into work centre performance
- Identification of resource constraints and inefficiencies

Decision Quality

- Complete understanding of the labour requirements for each battery type produced
- Data-driven justification of future capital investments

Continuous Improvement Enablement

- Structured platform to evaluate and prioritize process improvement initiatives
- Improved visibility into non-value-added activities

Implementation Timeline: ~ 9 months to operational DTO

Surette's DTO implementation project was funded by NGen, Canada's lead for Advanced Manufacturing in the country. It was also a key component of a co-funded Engineering Co-op Student Program. In this approach, each phase of the project coincided with a 4-month student work term. The project was led by the Plant Manager and the ERP Manager with assistance from an external consultant but most of the process and data analysis and modeling work was conducted by the Engineering student.

- **Phase 1:** Front-end process (3 months)
- **Phase 2:** Industrial batteries process (3 months)
- **Phase 3:** Monoblock battery processes & material handling (3 months)

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Why CBP for DTO?

- Purpose-built for operational and financial digital twin modeling
- Combines:
 - Value Stream and Activity-Based Planning process modeling
 - Resource planning based on Theory of Constraints (TOC)
 - Simulation of both operational and financials flows, costs and profitability
- Enables practical, executable DTOs — not just conceptual models
- Proven in complex, multi-line manufacturing environments

Key Benefits of CBP-DTO Modeling

- Clear visibility into true production constraints and available capacity
- Stronger foundation for ongoing CI and operational optimization
- Improved alignment between operations and finance
- Enhanced operational and financial budgeting and forecasting accuracy
- Ability to cost new products and model future customer demand scenarios

For more information

Assess your organization's opportunity to improve capacity, costing accuracy, and profitability using a DTO powered by CBP.

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