

Transforming Commercial Estimation Through Manufacturing Data Validation

Executive Summary

Accurate estimation is critical to profitability in manufacturing and construction environments. During a review of the Railing Division's estimation process, I identified a significant disconnect between theoretical quoting assumptions and actual shop-floor production realities.

The organization relied heavily on historical assumptions, outdated labor standards, and inconsistent inventory data, creating risk to project margins and reducing confidence in quoted costs.

Through a structured initiative involving Time Studies, Gemba Walks, Database Sanitization, Inventory Reconciliation, and Digital Tool Development, I transformed the estimation process into a data-driven system aligned with actual manufacturing performance.

The result was improved quotation accuracy, enhanced commercial confidence, reduced margin risk, faster estimating turnaround, and elimination of over \$900,000 in systemic inventory and data inaccuracies.

Business Environment

- Architectural railing manufacturing division
 - Project-based estimating environment
 - High-volume custom fabrication operations
 - Multiple product configurations and material types
 - Competitive bidding environment where quotation accuracy directly impacted profitability
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Business Challenge

The estimating department relied primarily on theoretical assumptions and historical estimates when developing quotations.

This created several operational and commercial risks:

- Quoted labor hours did not always reflect actual production effort.
- Material utilization assumptions were inconsistent.
- Inventory records did not fully align with physical stock.
- Obsolete products remained active within the database.
- Estimators lacked validated production data for decision-making.

As a result, there was a growing risk of:

- Underestimating labor costs
- Margin erosion
- Material shortages
- Inaccurate project pricing
- Inefficient capital allocation

Root Cause Analysis

I approached the issue as a system-level disconnect between Commercial Operations and Manufacturing Operations.

Using Gemba observations and process validation, I investigated how products were actually manufactured versus how they were estimated.

Key findings included:

Outdated Estimation Standards

Several labor assumptions were based on historical practices rather than validated production performance.

Lack of Production Validation

Limited time-study data existed to support labor calculations.

Inventory Discrepancies

Physical inventory did not always align with ERP records.

Database Integrity Issues

Obsolete and inactive products remained within the estimating system, increasing the likelihood of quoting errors.

Commercial-Operational Disconnect

Estimators often lacked direct visibility into actual production constraints and process times.

Improvement Strategy

The objective was to create a data-driven estimation system supported by validated manufacturing information.

The strategy focused on:

1. Validate actual production times.
 2. Improve inventory accuracy.
 3. Clean and standardize estimating databases.
 4. Reduce manual calculations.
 5. Improve pricing confidence and profitability.
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Solution Implemented

1. Time and Motion Studies

Conducted detailed production observations across multiple manufacturing processes.

Activities included:

- Process timing
- Setup validation
- Labor utilization analysis
- Production cycle studies

- Identification of non-value-added activities

This allowed theoretical assumptions to be replaced with validated production data.

2. Gemba-Based Validation

Worked directly with operators and supervisors on the shop floor to understand:

- Actual manufacturing effort
- Process bottlenecks
- Setup requirements
- Handling activities
- Variability between product types

This ensured estimates reflected real manufacturing conditions.

3. Estimation Database Optimization

Performed a comprehensive review of the estimation database.

Actions included:

- Removal of obsolete products
- Standardization of active product records
- Elimination of duplicate information
- Improved estimator usability

This reduced quoting errors and improved system reliability.

4. Inventory Reconciliation

Conducted physical verification and reconciliation activities between:

- ERP inventory records
- Physical inventory
- Material availability data

This improved material visibility and reduced planning inaccuracies.

5. Digital Tool Development

Developed Excel-based estimation tools supporting:

Unit-Level Quoting

Rapid estimation of standard products using validated production data.

Project-Level Cost Modeling

Comprehensive costing tools for large-scale projects incorporating:

- Material costs
- Labor requirements
- Production assumptions
- Yield calculations
- Margin analysis

These tools significantly improved estimating consistency and speed.

Quantified Business Impact

Performance Area	Before	After
Estimation Methodology	Historical Assumptions	Validated Production Data
Margin Risk	High	Significantly Reduced
Quotation Consistency	Variable	Standardized
Inventory Accuracy	Misaligned	Reconciled
Database Integrity	Obsolete Data Present	Standardized and Clean
Quotation Turnaround	Manual and Time Intensive	Rapid and Tool-Based
Commercial Confidence	Limited Visibility	Data-Driven Decision Making

Financial Impact

- Eliminated over \$900,000 in systemic inventory and data inaccuracies.
- Improved protection of project margins.
- Reduced risk associated with underestimating labor and material costs.
- Improved commercial decision-making and quotation confidence.

Operational Benefits

Improved Pricing Accuracy

Quotes reflected actual manufacturing conditions rather than assumptions.

Faster Estimating Process

Digital tools reduced manual calculations and improved response time.

Better Inventory Visibility

Alignment between ERP records and physical inventory improved planning effectiveness.

Enhanced Cross-Functional Collaboration

Improved communication between Estimating, Manufacturing, Purchasing, and Operations.

Sustainability Measures

To ensure long-term success, the following controls were established:

- Periodic production validation reviews
 - Ongoing database maintenance
 - Inventory reconciliation procedures
 - Standardized estimating tools
 - Continuous improvement reviews of labor standards
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Leadership Lessons Learned

Commercial Decisions Require Operational Data

The most accurate estimates come from validated production information rather than assumptions.

Data Integrity Drives Profitability

Reliable databases and inventory systems are critical to protecting project margins.

Gemba Creates Better Decisions

Understanding real manufacturing conditions leads to stronger commercial outcomes.

Automation Improves Consistency

System-based estimation tools reduce variability and improve scalability.

Conclusion

This initiative successfully transformed the estimation process from a theoretical model into a manufacturing-driven commercial system. By validating production data, cleaning critical databases, reconciling inventory records, and developing digital estimating tools, the organization improved pricing accuracy, reduced margin risk, strengthened operational visibility, and corrected significant inventory, costing, and estimation discrepancies across multiple projects. The result was greater commercial confidence, improved decision-making, and more reliable project costing.

Prepared By:

Hussain Syed, P.Eng., PMP

Operations Excellence | Cost Engineering | Manufacturing Systems | Commercial Optimization | Continuous Improvement