

Costing of DC Expenses CASE STUDY

SHIFT FROM TRADITIONAL COST MODEL TO PER UNIT COSTING MODEL

Background and Problem Statement

Retail warehouses are vital for managing inventory, fulfilling orders, and ensuring product availability. In this case, a 3PL-managed warehouse serves a major retail customer whose work volume varies widely. Seasonal demand peaks during holidays and promotional events create bursts of activity, while off-peak periods see significantly lower transaction volumes. Traditionally, the warehouse allocated costs based on fixed overheads—such as labour, equipment, and facility expenses—without regard for actual activity levels. As a result, the fixed workforce was maintained throughout the year, leading to a disproportionate cost burden during low-volume periods. The main challenges were:-

Variable Work Volume. Demand fluctuates significantly across seasons.

Fixed Workforce Cost. Staffing levels remain constant irrespective of activity, inflating per-unit costs during slow periods.

Inefficient Cost Allocation. Traditional methods do not account for the actual resource consumption of different warehouse activities.

Challenges with Traditional Costing

Under conventional costing systems, overheads were often allocated using a single metric—such as square footage or direct labour hours. This approach failed to capture the complexities of a retail warehouse where multiple activities drive costs. For instance,

Receiving and Put-Away. Handling incoming shipments requires varying levels of labour and equipment.

Order Picking and Packing. Costs associated with processing orders can spike during promotional events.

Shipping and Returns. Outbound logistics expenses fluctuate with demand.

The traditional uniform rate masked these differences subsidizing peaks and misrepresenting true profitability for both the 3PL and the retail customer.

Adopting a Per-Unit Transacted Costing System

To address these challenges, the warehouse management team implemented a per-unit transacted costing system based on Activity-Based Costing (ABC) principles. This approach reallocates overhead costs by linking them directly to specific activities performed per order or transaction. Key principles included:-

- **ABC Foundations.** Instead of averaging costs across all periods, the system assigns costs to discrete warehouse activities such as receiving, put-away, order picking, packing, and shipping. Each activity is costed based on actual resource consumption.
- **Per-Unit Focus.** Costs are measured on a per-order or per-pallet basis. In low-volume periods, the per-unit cost is naturally higher, while in peak periods, costs are spread over more transactions, reducing the burden on each unit.
- **Fair and Transparent Allocation.** This method ensures that the retail customer pays only for the resources they actually consume. It also allows the 3PL to justify staffing and operational expenses based on real activity levels, facilitating more equitable pricing and service level agreements.

Challenges Faced

For commencing the study, data had to be acquired from the client

- Data came in very organised form
- Analysis could not commence until the data was organised
- Post organisation of the data, inconsistencies were abundant
- Physical visit had to be carried out at sites to compile information as system entry discipline was lacking.
- Attendance of workforce was manual register-based entries, as the integrity was questionable.
- Clear bifurcation of cost under specific heads was not maintained and cost were mixed between cost heads

O&D Solution

The transformation to a per-unit transacted costing system involved several key steps.

1. **Mapping Activities.** The team identified all major warehouse operations—including receiving, put-away, order picking, packing, shipping, and ancillary functions like quality control and returns processing—and analysed their resource consumption.
2. **Identifying Costs.** Direct costs (e.g., wages for order handlers) were allocated to their respective activities. Indirect costs—such as utilities, facility maintenance, equipment depreciation, and IT support—were re-evaluated based on their relationship to specific warehouse functions.
3. **Automated Attendance and Billing.** Implementing biometric attendance system and automated payment system to provide accurate data on people cost, which is a major cost head.
4. measure, multiple cost drivers were chosen (e.g., number of orders processed, labour hours per transaction, equipment operating hours) to accurately trace costs to their respective activities.
5. **Allocating Costs.** With appropriate cost drivers in place, indirect costs were distributed among the various activities to capture overhead accurately.
6. **Calculating Per-Unit Cost.** Total costs were aggregated and divided by the number of transactions, yielding a per-unit cost that reflected seasonal volume fluctuations.
7. **System Integration.** The new costing model was integrated with the existing Warehouse Management

System (WMS) to enable real-time monitoring and timely decision-making.

Customer Benefit

The per-unit transacted costing system produced significant benefits.

- **Improved Cost Visibility.** Managers now have a detailed view of how each warehouse activity contributes to overall costs, allowing them to pinpoint inefficiencies during low-volume periods.
- **Dynamic Pricing Adjustments.** The 3PL can negotiate flexible pricing with the retail customer, with costs adjusting according to actual transaction volumes. Peak season volumes reduce per-unit costs, passing savings onto the customer while maintaining profitability.
- **Enhanced Workforce Management.** The system prompted a re-examination of staffing practices. While a baseline workforce was maintained for safety, the insights gained supported the exploration of temporary staffing during off-peak periods.
- **Better Strategic Decision-Making.** Detailed cost data enabled targeted investments in process improvements and automation. Both the 3PL and the retail customer benefited from a pricing structure that accurately reflected resource usage.

Key Success

- Operational Cost reduction by 12%
- Per person Productivity improvement by 18%
- Improved profitability to 3PL by 7% and consequent saving to client customer
- Activity based cost data available for data driven decision-making
- Visibility of every cost element
- Allowed for System integration and automated billing

Conclusion

Traditional costing methods, with their fixed overhead allocations, failed to reflect the true cost dynamics in a seasonally variable in the retail warehouse. By transitioning to a per-unit transacted costing model rooted in ABC, the warehouse achieved a more accurate, fair, and dynamic cost structure. This strategic shift not only reduced cost burdens during off-peak periods but also fostered a more transparent and mutually beneficial partnership between the 3PL and its retail customer, ultimately driving continuous operational improvement