



CostPerform – delivering bottom line benefits

Providing gold and silver service levels to customers

The company had two divisions. One was concerned with manufacturing a range of dry goods, the other with stocking and merchandising the products. The manufacturing division sold seventy per cent of its output to the merchandising division, the balance going to its own customers, some of the merchandising division's customers, and competing merchants. The merchandising division bought eighty per cent of its stock items from the manufacturing division and twenty per cent from competing manufacturers. The merchandising division sold and distributed to its customers via a regional warehouse network.

In common with many businesses of this type, the merchandising division had built up a solid customer base offering a standard next-day delivery service to everyone. Although the gross margins from all customers were positive, the sector was experiencing pressures from its customers to further reduce prices and improve levels of customer service. Management realised that existing management information offered limited support to the urgent commercial decisions they now faced.

However, under competitive pressure it needed to get an accurate understanding of:

- The relationship between Gross Profit and Trading Profit, where trading profit equals gross profit less selling, warehouse, distribution and stock carrying costs.
- Volumes sold, stock policies and customer service levels.

To get a quick overall view of the business the company decided to build a high level Activity Based Costing model before plunging into a lot of detailed analysis. This meant understanding the relationship between the major costs in the business and the key cost drivers. For the main activities, the first task was to determine their cost drivers.

The selling activity was made up from Central Office Sales, Regional Office Sales, the Salesforce and Sales Administration. On investigation, the salesforce activity was hardly ever to prospect for new business. Rather it was to 'prompt' and collect orders. Over fifty percent of orders came via the sales offices that then reacted to the order.

On this basis, the key cost driver for all types of sales was taken as the '# of orders'. A weighting was applied to reflect some regional differences.

The majority of warehouse activity was picking stock from pallet locations to make up orders. A small proportion of activity was consumed by putting away stock received from manufacturers. On this basis, the key cost driver for warehouse activity was taken as '# of picks'. A pick was an orderline on a customer's order which represented a specific stock location in the warehouse.

Customers were located around each regional warehouse. The 'stem' mileage time driven by each vehicle, to the centre of their delivery round was small. On this basis, the key cost driver was taken as '# of drops'. A drop was a stop at a customer to off-load an order.

The total warehouse stocking cost (cash tied up in inventory) was calculated on the basis that the value of stock per tonne was very similar across all product lines. On this basis, the key cost driver was taken as '# of tonnes delivered'.

From the company's normal transaction data in the system for each month, and cumulatively throughout the year, the total of each type of cost and the cost driver volumes were found. From this data, costs could be assigned to each customer. For a typical quarter the data is shown **below left**:

Demand tonnes	Sales Revenue	Purchase Costs	Gross profit	Delivery Costs	Warehouse Costs	Inventory Costs	Selling Costs	Trading profit
12808	13.31m	11.15m	2.16m	221k	78k	395k	587k	879k
Per tonne	1039	870	169	17	6	31	46	69

From this data, and the cost driver volumes, the unit costs were calculated, shown **below right**.

# Drops	# Picks	# Tonnes	# Orders
18700	63500	12808	21100
Per drop	Per pick	Per tonne	Per order
11.78	1.23	30.81	27.81

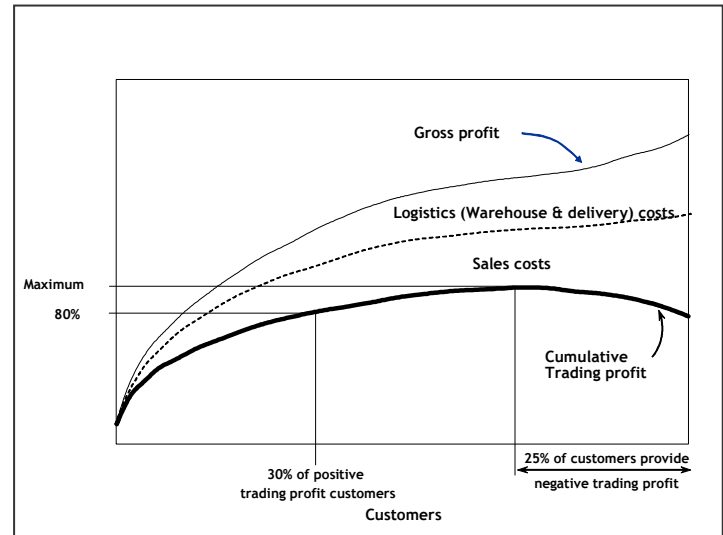
For each customer over the same period the revenue, purchase costs, number of drops, picks, tonnes and orders were found from the management information system. Costs were assigned to customers using the actual cost driver volumes for each customer and the unit costs calculated from the total throughputs in the analysis period. For one customer, the data provided the following analysis, shown in the **tables below**:

Demand tonnes	Sales Revenue	Purchase Costs	Gross profit	Delivery	Warehouse	Inventory	Sales
8.6	9.1k	7.6k	1.5k	12 drops	42 picks	8.6 tonnes	14 orders

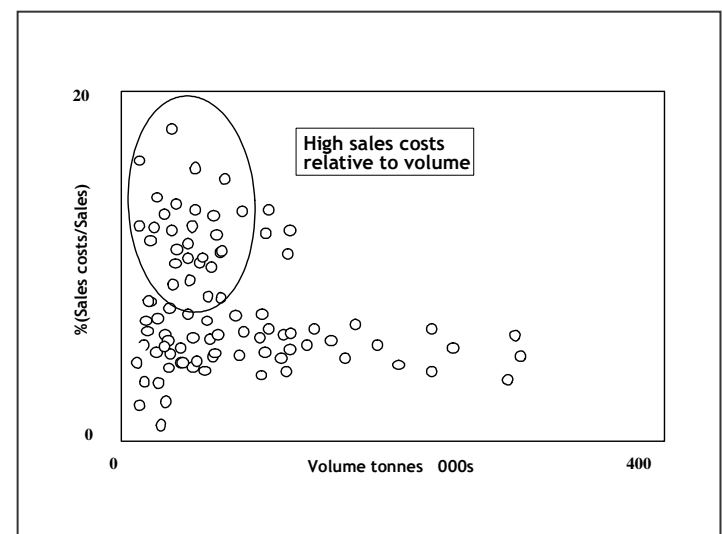
Unit cost	11.78	1.23	30.81	27.81	Trading profit
Assigned cost	141.4	51.7	264.97	389.34	652.59

The calculation of Trading Profit for each customer was then used to plot a hook curve of cumulative Trading Profit, from highest through to lowest as shown **below right**.

The hook curve gave the first indications of where the company could start to contemplate offering differentiated service levels. The potential 'Gold' customers would be the thirty percent that provided eighty per cent of the Trading Profit. The 'Silver' customers would be those that provided the next forty five per cent of Trading Profit. The last twenty five per cent were showing a negative Trading Profit and unless there was good reason to keep them, they became candidates for elimination or kept at a service level that reduced costs.



However, when the sales and logistics costs were added onto the Trading Profit for each company in the sequence, the Gross Profit curve that appeared had an odd characteristic. It seemed that some of the sales attracted a high Gross Profit but the costs of servicing the account severely eroded this figure. This prompted the company to extend the analysis to try and uncover the root causes. Many customer taking small volumes provided a negative trading profit as a percentage of sales revenue. These became candidates to either eliminate, or needed a change in the relationship, such as higher prices for the service level. More serious, a significant number of customers were also negative, but took a high volume of products. With discount pressure, the company had to look seriously at costs.

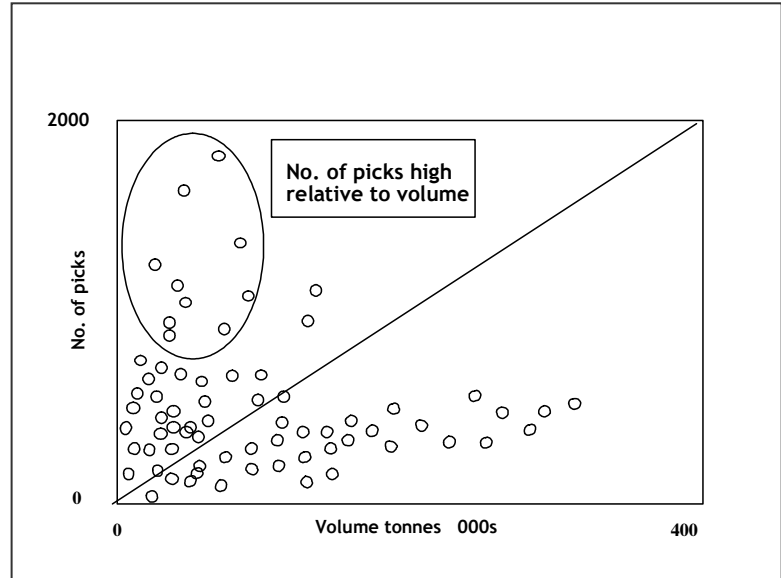


The number of picks in the warehouse was a key cost driver. A graph that plotted each customer on the basis of number of picks (orderlines) against the volume the customer ordered in a given period is shown **overleaf**.

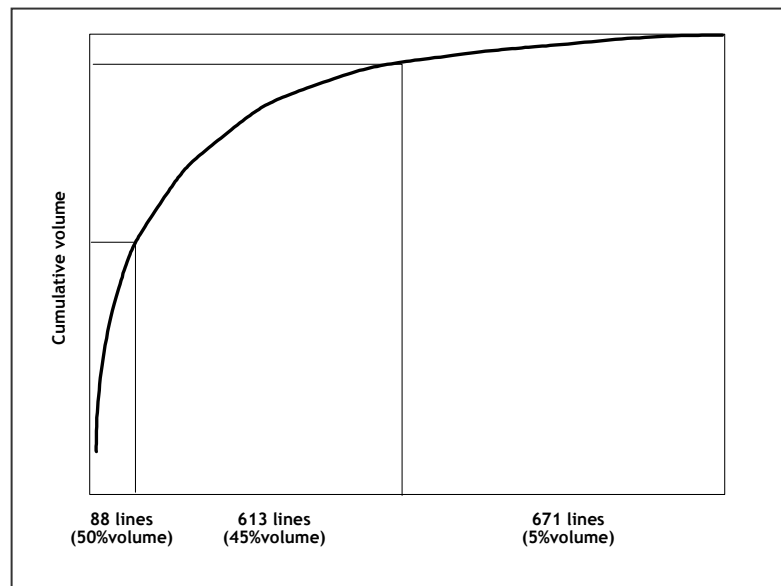
A number of customers had a disproportionately high number of picks for the volumes they ordered. Each of these customers' trading relationships with the company had to be scrutinised to determine if there was likely to be a trend in the future towards higher volumes per orderline which would reduce the impact of the warehouse activity on the costs of servicing the customer.

Given the high costs of the sales activities a graph was plotted of the sales cost against the volume the customers ordered in a given period. This is shown **right**.

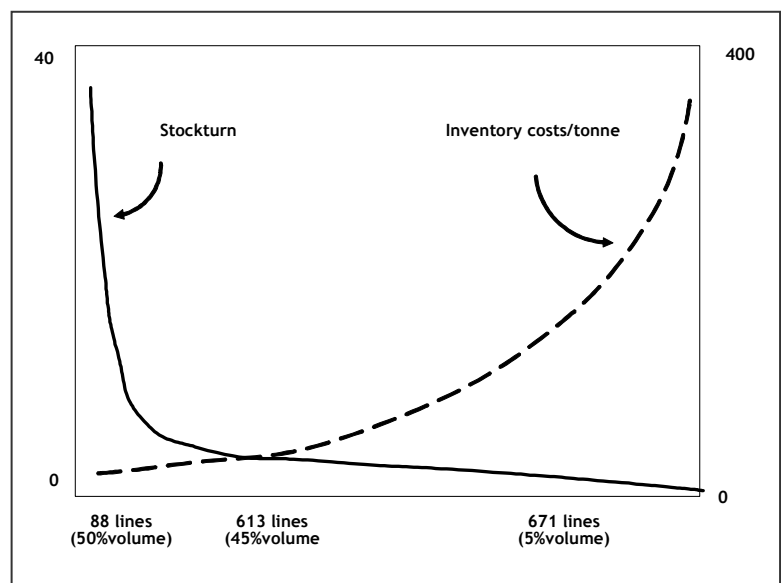
The sales costs for one segment of customers were very high given that the volume that resulted from the sales activities was small. Why were there so many customers that seemed to require such a high level of sales activity for such a little result? For many customers, the high sales costs led to the negative Trading Profit. Unusually, many of the sales to this segment of customers had some of the highest Gross Profits. The overall proportions of overhead costs indicated that inventory costs (cash tied up in stock in the warehouses) was unusually high for this type of Merchenting business.



This confirmed the need to analyse stock policies and demand patterns. The cumulative volume curve based on starting with the highest demand product line, showed a characteristic curve as shown **right**.



Of the total of 1372 lines stocked, 88 accounted for fifty per cent of the demand, 613 accounted for forty five per cent, and the remaining 671 lines only accounted for the final five per cent of demand. This is a characteristic of nearly every warehouse anywhere. There is always a tail of slow moving stock where you can find pallets of goods with thick layers of dust on them. To complete the analysis, the amount of stock held for the product lines was also investigated. The results are shown **right**.



Overall, the company was achieving a stockturn of 9. From the analysis, stockturns were found to be 24 for fast moving lines, 8 for medium and 1.4 for slow. However, head office was putting pressure on the Merchenting Division to improve this figure. How was such pressure usually met? The simplest and quickest route was to stop ordering fast moving lines so the warehouses drained of stock. Stockturns improved, but at the expense of more frequent stock-outs. This situation continued until customer complaints to the Chief Executive forced more stock back into the system. The impact of holding stock of the medium and slow moving lines was also seen in inventory costs. Medium lines had enough sales history to be statistically susceptible to using modern forecasting techniques.

Stock control in the past had been largely a rule-of-thumb exercise. Stocks of slow moving lines were caused by a number of factors:

- Failed launches of products, with the residue left in stock
- Special service arrangements made by sales people for particular customers
- Minimum order quantities set by the manufacturers

For these lines, serious consideration had to be given to sourcing them from other specialist Merchants. Also, a thorough purge of the slow moving lines had to be undertaken by every region. These actions significantly reduced inventory costs.

But why had such high warehouse and logistics costs grown over the years, despite constant management attention to keep the trend in check? Finally, the root cause was uncovered. Traditionally, the sales force had been paid a bonus based on gross profit. As a result, adding additional lines to stock, or incurring extra costs for small orders or tortuous and expensive special deliveries, had no impact on their bonus.

On the contrary, they would do many things, at any expense, to achieve a high gross profit. The ABM analysis had been fundamental at uncovering the major issue, that of bonuses to the sale force.

A change to paying bonuses based on Trading Profit had an overnight impact on the sale force's behaviour and a change to all customers becoming positive in terms of Trading Profit. The refined analysis of Trading Profit re-segmented the customers into the Gold, Silver and Bronze categories.

More detailed analysis uncovered the potential to change the service levels offered to customers. Among the Gold customers, research had indicated that a 'same-day' delivery service would increase market share.

The ABC data was used to model various scenarios in terms of order cut-off times, volume throughputs in relation to vehicle size and utilisation throughout the day. The key was to maximise the use of the assets, both vehicles and the people working in the logistics chain. Other customers in the Silver category were generally happy to receive the traditional next-day service. Those in the Bronze category were either candidates for next-day service or longer intervals of supply essentially determined by efficient delivery route planning.

An analysis of demand patterns was undertaken to measure 'variability' and 'demand volume'. Variability, (the standard deviation/average demand), is a measure of how frequently a product is ordered. The demand for products fell into a number of categories:

1. A stable demand for large and predictable orders
2. A stable demand for small orders
3. Infrequent and unpredictable small orders
4. Infrequent and unpredictable large orders

Each category indicated a different stock policy refined by the mix of customers ordering the stock together with the customer's service level.

Category (1) products could be shipped to the Merchanting Division's customers directly from the Manufacturing Division.

The stock levels for category (2) products were largely set by the suppliers' minimum delivery quantities.

Category (3) were better serviced by buying in from other Merchants as required to meet an order.

Category (4) would have no stock. Customers had to be prepared to order these with a long lead-time. These products were supplied to order, rather than serviced from stock.

The ABC techniques reduced unit costs and improved customer service levels profitably.

It was acknowledged that ABC had provided a superior result compared to the conventional techniques that had been used in the past to resolve logistics problems.

