



ONE EIGHTY

A new perspective for your enterprise performance

November, 2011

Cost Function Curves

Upcoming Events

- CAM-I Fourth Quarter Meeting Austin TX December 11-14
- 2012 [Beyond Budgeting Conference](#) Houston TX April 18-20
- APQC 2012 Knowledge Management Conference Houston TX April 25-27

Person in the News

- Charles T. Horngren for writing *Cost Accounting* (Prentice-Hall), a book that's been read by almost anyone that ever attended a college class on cost accounting.

This is the fourth in a series of five One Eighties devoted to planning and budgeting, a broken and antiquated process in most organizations.

The **opportunity**, first described in the final paragraphs of the February, 2008 One Eighty, [Planning and Budgeting](#) is now a reality.

"What's more exciting is optimized planning and budgeting. Imagine relaxing the assumption of a fixed forecast and solve for the optimum level of sales and marketing investment that provides the highest profit and ROI"

There are five basic components required for maximizing a plan's profit

1. [The Need for Change.](#)
2. [Unit-based Planning.](#)
3. [Response Functions](#), how product and services respond to varying levels of sales and marketing efforts.
4. Cost functions, where all the cost **drivers** in the plan are replaced with cost **functions**, the subject of this One Eighty.
5. Supply chain, relaxing the constraint of a fixed supply chain, is the concluding subject of the series.

Cost functions are defined by Dr. Charles Horngren as "*descriptions of how a cost changes with changes in the level of an activity or volume relating to that cost.*"

Volume (units, weight, or cube) drives a change in cost that could be 100% variable with increases or decreases in volume or fixed costs and don't change with volume at all. Cost function curves document the relationship.

In optimization and maximizing profitability, all cost functions must be linear, stepped or fixed. Cost functions lay the foundation for **unit-based planning** because the slope of the cost function curves can be calculated from unit rates and planning factors [Align Cost Function.](#)

These cost functions also allow changing the objective function as described in last month's One Eighty from a proxy for profit (i.e., revenue minus sales/marketing cost minus a fixed product margin) to true profit.

The original unit-based plan now modified with response functions and cost functions, appropriately constrained, is passed to the optimization "engine." It solves for the marketing and sales effort that maximizes the plan's profit. It also develops all the associated revenues and costs for the projected income statement.

As an illustration of a profit maximization opportunity ignored by a unit-based model with a fixed forecast, a response function and a cost function were introduced to the outbound call center model from CAM-I's [The Closed Loop.](#) Profit was improved by more than 50 %.

*The future is here; isn't it time to act?
Alan Dybvig.*