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BUILDING BETTER FORECASTS AND BUDGETS

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Most organisations are painfully aware that forecasting and budgeting error impacts not only on quality and productivity, but also on profitability. This article examines why forecasting error seems so common, and offers some options.

There is no doubt as to the importance of effective forecasting and budgeting. Whether we are attempting to forecast sales, production, accidents or incidents or any other business activity, there is a price to pay for failure.

For example, if a sales forecast is too far from what actually happens, then everything from inventory levels, production schedules, costs and customer service levels will be adversely affected. Because the importance of effective forecasting is so well established, it will be belaboured no further.

THE CURRENT REALITY

Most companies will admit that their forecasting leaves something to be desired. Some are good. Others are very poor. A few seem to suffer a forecasting error so great as to precipitate at least one minor disaster each year. Every company canvassed during the preparation of this article stated a desire to improve. This leads to a hypothesis:

HYPOTHESIS

Forecasting error is so common, forecasting is either more difficult than we imagine it to be, or we are doing something fundamentally erroneous (or some combination of both).

This hypothesis may sound trite. It is not. The evidence indicates that unless we can come to grips, at an emotional as well as a logical level, with the notion that our current methods are failing us, nothing much will change.

The most common outcome of failing to accept that existing methods need replacing is that we continue to

“fine tune” the existing methods. Seldom do we step back, take a fresh look and redesign a new system. Consequently, many companies have a forecasting system that predictably fails.

One example comes from a company that we will call Wyse Mfg. This is not a hypothetical business. It exists, and it is used here because its problems are common. Here only reasonably mature products and services will be considered. For our purposes here “mature” means that the product has been in the marketplace for at least a year. New products are inherently more difficult to forecast, and should be treated separately.

At Wyse Mfg. detailed forecasts are prepared for the annual budget. These forecasts are revised at least quarterly. For mature products it is possible to predict what will happen during the following year.

For the first few months, sales will fall below forecast for most lines. The monthly reports will explain the reasons for this and describe corrective action being taken. After three to four months, a considerable shortfall will have accumulated. This is likely to result in a special promotion/sales drive, at significant expense. Also, it is possible that monthly forecasts for the remainder of the year will be revised upwards in order that the end of year budgets will be met.

By midyear, it starts to become clear that the budget is unlikely to be met, and the sales budgets are reluctantly revised downwards. However, the new budgets are still going to be tough to meet.

By the time the year is about nine months old, it becomes obvious that even the revised budgets will not be met. Now they are revised downwards again. Often, these revisions are large enough to be dramatic. Production managers find themselves stuck with large stocks of raw material and yet more changes to production scheduling. A drive to reduce costs is launched, in order that profitability targets are not compromised. Some creative accounting commences.

At about this time, the budgets for the following year are being finalised, and it is possible to predict that the new forecasts will, once again, be optimistic.

WHY IS FORECASTING SO DIFFICULT?

So many reasonably well managed businesses seem to have difficulty producing effective forecasts that one is inclined to ask: "Is this problem limited to business?"

The answer is a resounding "No!" Numerous studies have demonstrated the widespread nature of this problem. About 85% of all fund managers and advisers under-perform the DJIA and the S&P 500. Psychiatrists are poor at forecasting patient progress. Completion dates are regularly missed for projects of all types. In every field examined, the problem persists. This is true even in those businesses where a reasonably sound understanding of random and non-random variation exists.

SOME BASIC TRUTHS

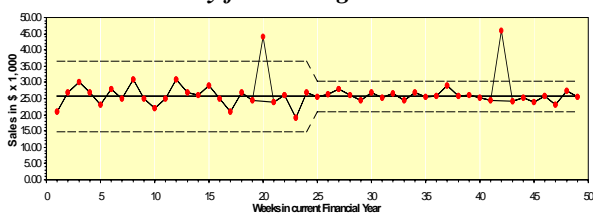
Truth 1. *All forecasts are wrong, some are useful.* The useful forecasts are those that turn out to be close to the actual results that follow. Those managers looking for perfection are doomed to disappointment.

Truth 2. *All forecasts change with time.* A forecast changes with circumstances. We live in a dynamic world, not a static one. As markets, competitors, customers and our own products and processes change, so too should our forecasts.

Truth 3. *Forecast accuracy is governed, at least in part, by variation.* The higher is the natural variation in your market and your processes, the greater the difference between forecast and actual is likely to be. As you reduce variation in your business, forecast precision can be improved, as noted in Figure 1.

Figure 1

Note how reduced variation in weekly sales reduces likely forecasting error.



Truth 4. *The further into the future a forecast is made, the less reliable it becomes.* Again, time and change are bedfellows. It is imperative that a forecast

be a dynamic model, rather than rigid, and be regularly updated.

TYPES OF APPROACHES

For our purposes here, two different types of approaches to forecasting will be considered. They are inside forecasting and outside forecasting. In reality, a blend of both is used, but a strong bias towards one or the other is nearly always present.

INSIDE FORECASTING

This term describes analysis from inside the process. For example, in the stock market, analysts will study P/E ratios (and a host of other ratios too numerous to list here), cash flow, strength of management, likely new products and their impact, competitor activity, interest rate projections, recent growth in earnings and projections for the coming year(s). All this is done to arrive at a fair market price, and predictions that lead to suggestions as to whether clients should buy, hold or sell.

In business, we do similar things as we prepare our forecasts. New technology has placed at our disposal huge amounts of data on which to base our forecasts and other decisions. And yet in every field of endeavour this approach to forecasting has been disappointing at best. True, some companies do it better than others. Nonetheless, most agree that their performance needs to improve.

In particular, the evidence suggests that technology has resulted in data overload, and that the quality of forecasts is not improving with the availability of greatly increased amounts of data. If anything, the quality of decision making is declining proportional to the amount of data digested in the decision making process. This is not news. The military discovered this truth soon after the Second World War. Our reaction...is to gather more or new data...or to add new analyses. Is there a better way?

OUTSIDE FORECASTING

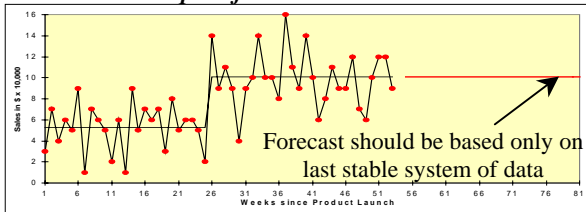
This approach ignores all the detail mentioned above and looks at the overall historical performance. Initially, no data from inside the business is required. Only outcomes from the business (sales, production levels, etc.) are used.

One approach is to plot as a simple run chart the historical sales, competitor sales and industry sales and to assume that any trends currently evident will continue **unless an undeniably significant event is about to take place that will alter these trends.** It can be stated without hesitation that outside forecasting produces a more reliable result in at least 70-80% of all mature products and services. This applies to sales forecasts, production forecasts, and forecasts of machine availability or performance.¹

A simple way of demonstrating this is to take (say) the past five years' sales data. Plot the first two years and

extrapolate the current centre line or trend line as a forecast for the next year, as noted in Figure 2. At the same time, draw on the chart the actual forecast produced at the time. Now plot the next year's data, on a monthly or weekly basis. Which forecast was superior? Repeat this process, year-by-year, projecting the centre line as an outside forecast, comparing it with the forecast actually used.

Figure 2
Example of an Outside Forecast.



WHY IS OUTSIDE FORECASTING GENERALLY SUPERIOR?

Undoubtedly, many factors are at work. Only two will be examined here. The first is over-confidence and over-optimism. The second is the fact that most managers are superior at linear data processing than they are at configural or interactive analysis.

OVER-OPTIMISM

Generally, inside forecasts that exceed actual results are outnumbered by those that fall on the low side. The estimate for businesses canvassed as this article was being researched is that for every inside forecast that is exceeded, three to five will be too optimistic when compared with the actual outcomes. Whilst the pressure to create growth or improvement will play a role here, the fact that these ratios persist so broadly in fields other than business indicates that other forces are at work.

One clearly demonstrated phenomenon is that our paradigms “filter” the data at an unconscious level. We tend to give more credibility to the data that tell us what we want to hear, or to those that entrench an already accepted position.¹ Studies show that as the amount of data included in the decision is increased, the confidence in the decision increases, even when that confidence is not justified.

The mass of numeric and non-numeric data being studied can become an enormous Rorschach test. Add to this the often-subconscious effects that our emotions play and we have every opportunity for significant error. It seems that inside forecasting may be far less objective than we would like to think.

LINEAR AND CONFIGURAL PROCESSING

Most humans do a far better job of linear processing than they do when configural or interactive processing is called for. This should come as no surprise. Linear processing is much simpler, and yet inside forecasting calls for interactive processing.

The number of factors under consideration need not be large before the possible combinations and interactions become so complex as to be manageable by only a handful of very talented people, if any.

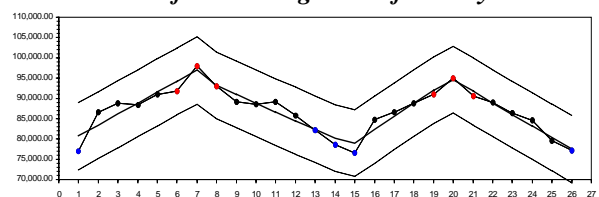
A sales forecast will have many variables including competitor activity, consumer confidence, changes in price or quality, customer service levels, interest rates, inventory levels to support sales, advertising/marketing programs planned, the impact of new models/products (by both us and by the competition) and vendor activity. When these variables are studied in an interactive way, a very small error in assessing one of them can lead to a gross overall error. Outside forecasting calls for linear processing, something which most humans can handle and which is less sensitive to errors in estimates to inputs.

SOME DEVIATIONS

Volatile industries such as building and construction can see significant swings in market activity. In these cases, a superior approach is to outside forecast the entire market sales for the next twelve months. Adjust this forecast, if necessary, taking into account anticipated economic and construction activity and then produce a company forecast based on historical market share.

Some industries have an annual cycle in their key performance indicators. Room sales in hotels provide one example. In some cities, room sales are predictably higher in summer than they are in winter.² The simplest way to handle this and similar situations is to draw the centre line as a cyclic curve, or as trend lines as noted at Figure 3, and to extrapolate this seasonal centre line as the initial outside forecast.

Figure 3
Note the annual cycle in this data showing monthly room sales for a Chicago hotel for two years.



WHICH APPROACH TO USE?

What seems to work better in most cases is an outside approach that is modified by taking into account only that small number of impending profound changes that are almost certainly going to have a significant impact. This can be tricky ground, and defining “profound” or “significant” can be difficult. Nonetheless, most companies that use this approach have enjoyed a reduction in forecasting error as well as an attendant reduction in costs. Naturally, the less week-to-week or month-to-month variation that exists about the extrapolated forecast, the more smoothly matters operate.

The use of outside forecasting does not mean the elimination of breakthrough objectives. This is particularly true for innovative changes to marketing, products or to processes. The preferred approach is to prepare a budget based primarily on outside forecasting, **that can be all but guaranteed within the limits of natural, random variation**, and a business plan that incorporates breakthrough objectives and/or innovative changes. In this way the baseline financial plan is secured, and the pursuit of new horizons is not compromised.¹

There are always better ways of doing anything, but to achieve such improvement requires a willingness to change. A quality based approach to forecasting and budgeting holds much potential for businesses willing to make the change.

References:

1. *Metamorphosis*, J. McConnell, Wysowl Pty Ltd, 1997
2. *Analysis and Control of Variation*, J. McConnell, Quantum House limited, 1987