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supply chain benchmarking and performance measurement towards the learning supply chain

by EDWARD SWEENEY, Director of Learning, NITL

1. INTRODUCTION

It is generally agreed that the overall objectives of supply chain management (SCM) are to:

(i) optimise total supply chain costs and investment; and
(ii) deliver appropriate levels of customer service in targeted market segments.

When introducing supply chain improvement projects within companies two broad aspects need to be measured in line with these overall objectives:

- The impact of the improvement on the performance of the local area, and
- The impact of the improvement on overall supply chain performance.

Examining both aspects ensures that a holistic (top-down) approach is combined with a detailed (bottom-up) perspective. This is important if all measurement is to be carried out in an integrated manner whilst simultaneously ensuring that requisite attention is paid to detailed issues (after all the devil is often in the detail!) at each point in the chain.

Supply chain improvement projects are so diverse that this article could not hope to cover all methods of measuring individual initiatives and so the aim is to examine the measurement of overall supply chain performance from both an external and internal perspective.

Traditionally companies, and management accounting systems, measure two key aspects of performance, namely effectiveness and efficiency.
Effectiveness is the degree to which a predetermined objective or target is met. *Efficiency*, on the other hand, is the degree to which inputs are used in relation to a given level of outputs. Colloquially, effectiveness is concerned with *doing the right things* while efficiency is concerned with *doing the things right*. Customer service measures are examples of the former while many cost-based measures are aimed at the latter. It is possible to achieve one of these aspects without the other but obviously both efficiency and effectiveness are required simultaneously (i.e. one would ideally like to be *doing the right things right*!).
The inability of traditional management accounting and performance measurement systems to both encourage and measure both areas has become a major issue in both academic and industrial circles.

Furthermore, successive NITL surveys have indicated that there is serious room for improvement in approaches adopted by Irish companies in relation to supply chain performance measurement. For example, a minority of companies recently surveyed measure customer service and, of these, most adopt quite an informal and incomplete approach (NITL 2001).

This article addresses:

- external performance measurement and how external information on other companies can be used as a basis for benchmarking; and
- internal performance measurement, examining behavioural aspects and related issues.

2. EXTERNAL MEASUREMENT

External performance measurement information is required by two main groups - those shareholders and potential investors who use this data to make informed investment decisions. Managers (including supply chain managers) use such as a basis for strategic and tactical decision making. The primary source of this information for shareholders and investors is the company's published financial accounts. Interpretation of published financial accounts involves a number of techniques, which can be applied to measure financial performance based on the information contained within a company's annual, or interim report.

A detailed discussion of these techniques is beyond the scope of this article but they include:

- *trend analysis* techniques where a series of figures are compared over time (e.g. stock turnover);
- *common size statements* where outside factors such as inflation are removed (e.g. stock as a proportion of total assets); and
- *financial ratio* analysis.

The latter area is very well developed and ratios typically used include:

- *performance ratios* which measure profitability (e.g. return on net assets or capital employed or ROCE);
- *financial status ratios* which measure financial liquidity (e.g. current or working capital ratio and the acid test or liquid ratio); and
- *investor ratios* which assess investment attractiveness (e.g. earnings per share or EPS and the price to earnings or P/E ratio).

Since many of the ratios are interrelated it is common to use a pyramid of ratios to assess a company's performance across a number of areas.

The focus thus far has been on the use of financial reports by stockholders and investors but there is a growing need for companies to review their own performance with respect to their competitors and to the world's best companies. This practice has existed for many years but has become more formalised in recent years under the banner of *benchmarking.*

3. BENCHMARKING

What is benchmarking? (NITL 2003)

In very simple terms to benchmark is to compare yourself with someone else in order to measure how effective and/or efficient you are. In athletics events, for example, the benchmark might be the current world record and individuals get the opportunity to compete openly with one another at events such as the World Championships. Even within sport, athletes will not necessarily know the details of an opponent's training schedule, diet or use of drugs. Companies compete in world markets and, just like the athlete, firms would like to identify specifically why they are failing to win orders with respect to the competition or where they need to improve.

The following are accepted definitions of terminology associated with benchmarking and are taken from PERA International.

Benchmarking
A continuous, systematic process for evaluating companies recognised as industry leaders. To develop business and work processes that incorporate "best practices" and establish rational performance goals.

Best practices
The methods used in work processes whose outputs best meet customer requirements.

Benchmarks
Performance measurement standards derived from definition or quantification of best practices.

The most obvious and simple form of benchmarking is to buy your competitor's product or service. Many companies have used this technique, also known as reverse engineering, in design and manufacturing where they strip down the competitor's product to examine the design, manufacturing methods, sources of component supply and other relevant factors. However, Rank Xerox is usually credited as being first to see the real potential for benchmarking. They started in 1979 by stripping down products but went on to experiment with the concept in other areas. There are now at least five different ways to carry out benchmarking comparisons.

Internal benchmarking

This is where operations within one company are compared. For instance, in a large group several strategic business units might make similar products or use similar processes. All manufacturing units will need to carry out machine maintenance and all units, whether in service or manufacturing, have to handle customer orders and generate invoices. The first step for a firm would be to identify their best performers and more importantly how this level of performance is achieved so that the ideas can be implemented in other areas. Benchmarking of performance between country operations in multinational companies is also an example of this.

Competitive benchmarking

The next step might involve going outside the company to direct competitors. There are many aspects of supply chain performance which can be usefully benchmarked in this way. Access to appropriate data can be a problem between direct competitors but there are ways of overcoming this obstacle. For example, NITL runs a number of supply chain benchmarking clubs where data supplied by a club's membership is generally confidential to the club members.

Functional benchmarking

Comparisons are still made within the same broad industry using similar functions. The classic example of this involves printed circuit board (PCB) assembly. Many industries assemble PCBs, so rather than making a comparison with a direct competitor, a company in another market, or making a different product but with the same technology, is chosen. Naturally non-competitors are more likely to be a fertile source of useful information.

Generic benchmarking

Here comparisons are made with totally unrelated industries. For instance, it is said that the founder of Just-in-Time (JIT), Taichi Ohno of Toyota, came to the West to study manufacturing but found little inspiration until he visited a supermarket. Here he saw that the store had little, or no, inventory other than the goods on the shelves and merely replenished these items as they were used. This pull mechanism provided the foundation for JIT production.

Customer benchmarking

Comparing performance against customer expectation. This is carried out

routinely by most successful companies. It is a form of comparison which many companies have conducted under the more familiar title of 'market research'.

Through benchmarking a company is continually looking for new ideas, methods, practices and processes which can be adapted to suit the company. The basic philosophy involves the following stages:

'NITL SURVEYS HAVE INDICATED THAT THERE IS SERIOUS ROOM FOR IMPROVEMENT IN APPROACHES ADOPTED BY IRISH COMPANIES IN RELATION TO SUPPLY CHAIN PERFORMANCE MEASUREMENT.'

(i) **Identify *what?*** This involves identifying the critical success factors (CSFs) which the benchmarking exercise will focus on.

(ii) **Identify *who?*** This is concerned with deciding on the form of benchmarking to be used (e.g. internal, competitive, etc.) and on the SBU, company or companies to work with.

(iii) **Plan *how?*** This stage involves planning the detail of the exercise. Ensuring that the required data is collected efficiently is a key consideration.

(iv) **Analyse.** At this stage the data collected is analysed with specific reference to the identification of appropriate supply chain best practices and benchmarks.

(v) **Use.** This is when the information generated is actually used to develop new and innovative practices. It must be emphasised that, as all companies are unique, it is imperative that the appropriateness and applicability of any practice to one's specific operation is considered in detail. Benchmarking is not about copying other company's approaches; rather it is about learning and *adapting* appropriate practices so that they can be usefully *adopted* in an effort to improve efficiency and/or effectiveness (*adapt* before *adopt*ing!).

When should you use benchmarking?
Benchmarking potentially fits very well

as part of any supply chain improvement or re-engineering process. For successful change you need to recognise the need, know what to improve and have an idea of what the company should look like after the improvement. Benchmarking can be used to create a recognition of the need for change by highlighting the gap between you and the competition. By investigating best industry practice a company starts to identify where improvement is necessary, the size of the change needed and ideas on how the improvement can be achieved. Finally by looking at what others have achieved it can provide a picture of the 'goal' or objective.

So when is benchmarking most appropriate? Not surprisingly strong advocates of benchmarking argue that it is applicable in a wide variety of situations. However, it appears most useful if:-

- People feel invulnerable to any competition, believing they are already the best.
  This is a very dangerous frame of mind. Even if you are currently the world leader you will undoubtedly have competitors who are seeking to take your place and if you become complacent they almost certainly will take your place.
- The company has a very strong culture and many long serving employees.
  Loyalty to the company should be valued but if you have only ever worked in one company it is easy to become stale. Visits to other companies may help spark off new ideas and demonstrate that there are other ways to do things.
- The exact reasons for falling market share are unknown.
  Benchmarking can identify what customer needs are and how the competition satisfy these needs.
- The need for change is recognised and critical success factors identified but the firm does not know how to improve and/or how much to improve by.

The author's experience suggests that companies do not need to be the world's best at everything. All companies have finite resources and benchmarking can help to identify where these resources should be targeted.

4. INTERNAL MEASUREMENT

Having looked briefly at measurement based on information available externally the focus now moves on to examine a critical area of interest for supply chain managers: internal performance measurement.

Robust performance measurement systems need to be designed to measure and encourage the key overall supply chain objectives of customer service and

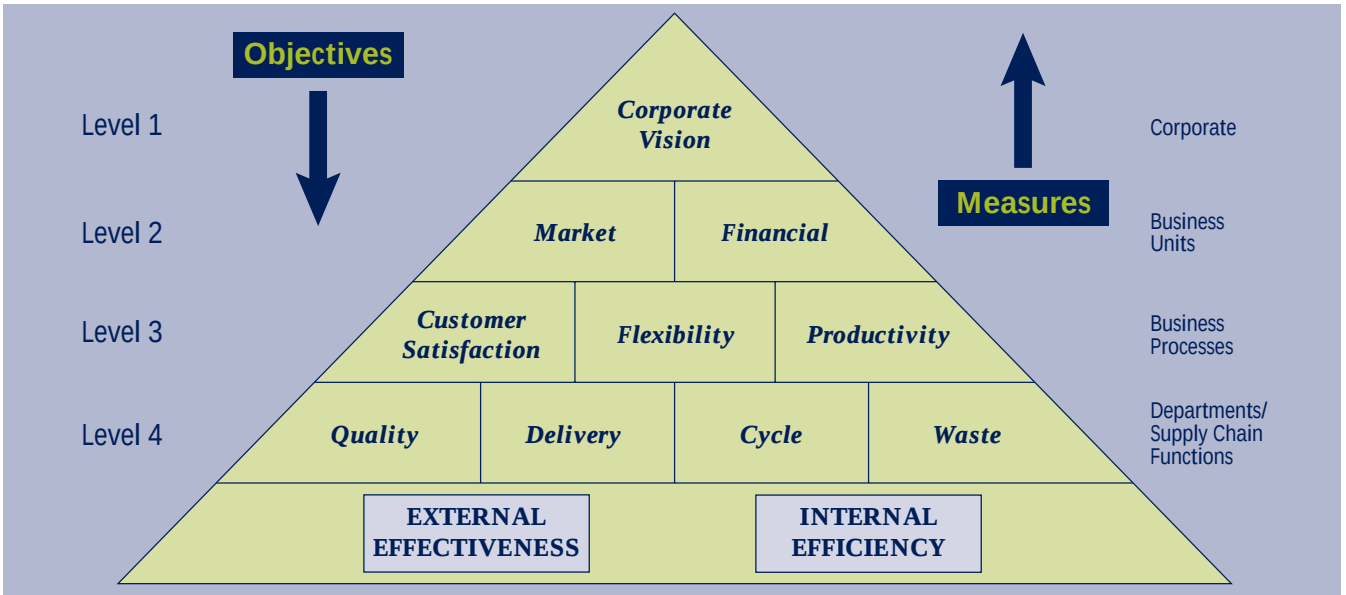

Figure 1: Performance Pyramid

cost/investment in a manner consistent with the company's overall strategic direction. It is not intended to examine in great depth the psychological implication of performance measurement but merely to recognise that the introduction of performance measurement will cause people to alter their behaviour (*what gets measured gets done* or *you get what you measure*). Obviously the objective of a performance measurement system will be to provide information which will both enable people to identify where improvements are needed and to motivate them to make these improvements. However, most people can recall examples of where performance measurement has encouraged behaviour which was inconsistent with an organisation's overall goals. For example, in manufacturing the measurement of utilisation can encourage managers to keep their staff busy making products which are not needed and end up in stock, increasing inventory holding costs and tying up resources. Most businesses are complex and measurements in many different areas will be needed in order to accurately establish the level of operational effectiveness and efficiency.

A key objective of SCM is concerned with activity integration. Traditionally, many companies have measured, and therefore managed, the various supply chain functions (e.g. purchasing, manufacturing, distribution, etc.) very much in isolation from each other. It is vital that an integrated approach to supply chain performance measurement is adopted if the move away from this form of fragmentation, towards a more integrated approach, is to be achieved.

Establishing and Supply Chain Performance Measurement System

One approach to the establishment of integrated systems of performance measurement involves the use of the performance pyramid originally proposed by Cross, Lynch and McNair in the early 1990s (see Figure 1). This pyramid shows the translation of corporate vision into business unit objectives with respect to financial and market targets. These are then broken down into goals for each area of the business in three areas: customer satisfaction, flexibility and productivity. These are finally translated into day-to-day measures for individual teams. The pyramid also indicates that objectives are cascaded down the organisation while measures are communicated back upwards.

Applying this approach to the development of a supply chain performance measurement system involves:

- Understanding the role of customer service (*market* objectives and measures in the pyramid) and supply chain costs and investment (*financial* objectives and measures in the pyramid) in the context of the overall *corporate vision* (Level 1 and Level 2).
- Identification of the key elements of customer service in each targeted market segment and setting objectives in relation to each element. A similar process is carried out in relation to supply chain costs and investment. For example, all supply chain cost drivers needs to be identified and objectives set in relation to each one (Level 2).
- By a process of stepwise decomposition, these objectives can be broken down into specific goals for each link of the supply chain. In line with the pyramid, goals are established in relation to *customer satisfaction*, *flexibility* and *productivity* (Level 3).
- Finally, these goals are translated into detailed key performance indicators (KPIs) of, for example, *quality*, *delivery*, *cycle time* and *waste*. This is done for each supply chain function; for example, purchasing and procurement, production, warehousing, transportation and customer service (Level 4).

The overall objective of this approach is to ensure that an integrated system of supply chain performance measurement is put into place, thus avoiding the scenario where individual functions are measured, and therefore managed, in isolation from each other. This facilitates the transition from the traditional, highly fragmented approach to a more holistic and integrated one.

Performance Measurement in World Class Companies

In designing robust and integrated supply chain performance

BENCHMARKS ARE PERFORMANCE MEASUREMENT STANDARDS DERIVED FROM DEFINITION OR QUANTIFICATION OF BEST PRACTICES

measurement systems, it is important to study and learn from organisations who are regarded as exemplars of best practice. Based on the work of Maskell, and on the author's experience, the following are some of the features which tend to be incorporated into the performance measurement systems of successful companies:

- Measures should relate directly to company and business unit strategy;
- An integrated approach should be adopted across the company and the supply chain in line with the performance pyramid approach;
- Within this integrated overall approach detailed measures will vary from area to area;
- Measures should change over time to reflect changing imperatives and priorities;
- Measures should be as simple and easy to use as possible;
- Measures should give fast feedback to staff;
- Measures should be acted upon (otherwise they become somewhat futile);
- Excessive numbers of measures should be avoided (if you try to measure too many things you may end up effectively measuring nothing!); and
- Measures should aim to "teach" staff about their sphere of operation and as a basis for continuous improvement, rather than being purely for monitoring and control purposes.

5. CONCLUSION:

The Learning Supply Chain

The need for continuous innovation and improvement in all aspects of a company's supply chain has long been recognised – successful companies practice this Kaizen approach. Standing still means falling behind in today's increasingly competitive market places. Effective performance measurement provides companies with the only rational basis for continuous improvement. As world class companies have experienced, external and internal performance measurement is the primary mechanism for organisational learning at all levels. A *Learning Organisation* is an organisation which recognises the importance of this type of learning, and which has developed practices which reflect this. Similarly, a *Learning Supply Chain* is a supply chain which takes learning seriously at all levels and which bases its learning initiatives on its performance measurement system. The successful supply chains of the future will be those which are agile. A key ingredient of agility is the ability to learn and to respond quickly to changing market and other requirements. The organisational learning that effective supply chain performance measurement delivers will become even more important. In short, the successful supply chains of the future will be the *Learning Supply Chains* which:

- learn world class best practice through benchmarking;
- develop and implement robust and integrated performance measurement systems; and
- base improvement initiatives on the learning derived from these systems.

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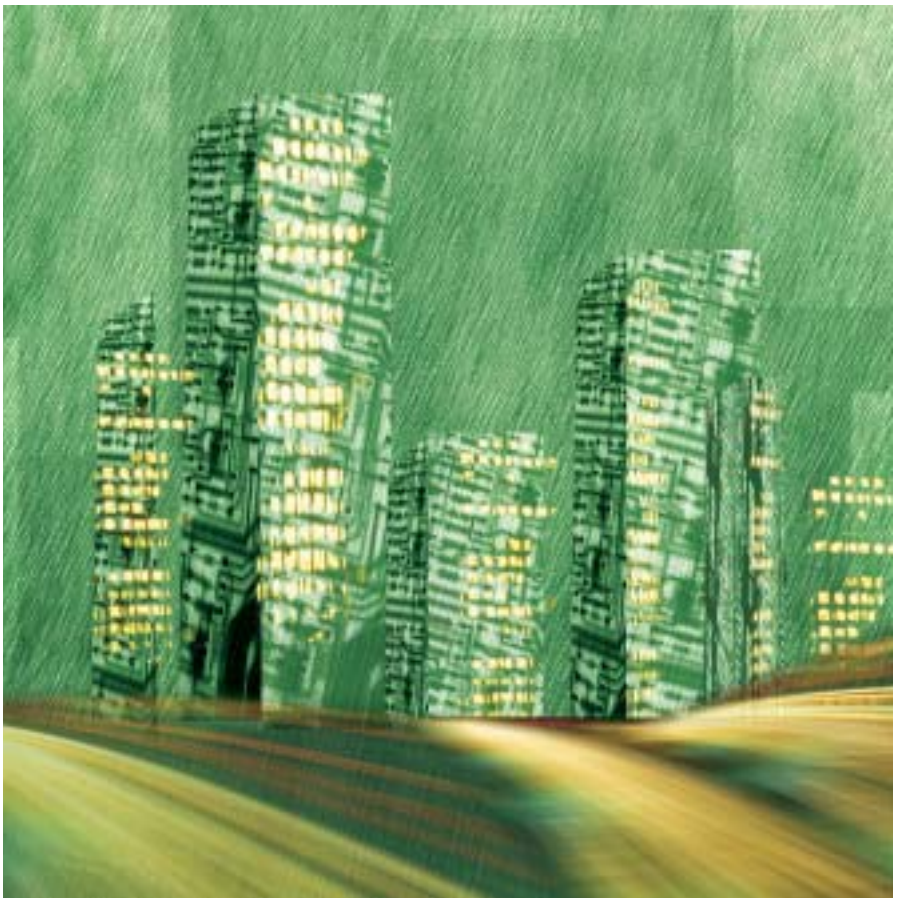
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