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Supply Chain Benchmarking and Performance Measurement: Towards the Learning Supply Chain

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INTRODUCTION

As pointed out in Chapter 3, the overall objectives of supply chain management (SCM) are to:

- Optimise total supply chain costs and investment.
- 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.
- 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 link in the chain.

Supply chain improvement projects are so diverse that this chapter 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 the areas has become a major issue in both academic and industrial circles. Furthermore, there is evidence that there is serious room for improvement in the approaches adopted by companies in relation to performance measurement generally, and to supply chain performance measurement specifically.[1]

This chapter addresses:

- External performance measurement and how external information on other companies can be used as a basis for benchmarking.
- Internal performance measurement and the establishment of integrated approaches.
- The concept of the *learning supply chain*.

External Measurement

External performance measurement information is required by two main groups. Shareholders and potential investors use this data to inform investment decisions. Managers (including supply chain managers) use it 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 chapter. They include:

- **Trend analysis** techniques where a series of figures are compared over time (e.g. stock turnover).

[1]In Ireland, for example, a minority of companies recently surveyed measure customer service and, of these, most adopt quite an informal and incomplete approach (NITL 2005).

- **Common size statements** where outside factors such as inflation are removed (e.g. stock as a proportion of total assets).
- **Financial ratio** analysis.

The latter area is very well developed and financial 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).
- **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*.

The Role of Benchmarking

In very simple terms, to benchmark is to compare yourself with someone else 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 definitions of terminology associated with benchmarking (based on Spendolini 1992).

- **Benchmarking**: A continuous systematic process for evaluating the products, services and work of organisations that are recognised as representing best practices for the purpose of organisational improvement.

- **Best (or appropriate) practices**:[2] The methods used in work processes, the outputs of which best (or most appropriately) meet customer requirements.
- **Benchmarks**: Performance measurement standards derived from definition of best practices.

The Benchmarking Process

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, Xerox is usually credited as being the 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 several different ways to carry out benchmarking comparisons (based on Ahmed and Rafiq 1998):

Internal benchmarking: This is where operations within one company are compared. For instance, in a large group several strategic business units (SBUs) might make similar products or use similar processes. 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.[3]

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),

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[2]As noted earlier, it is for this reason that the author is more comfortable with the concept of 'appropriate practice', as opposed to 'best practice'. The latter implies that there is one superior approach, irrespective of the nature of the company and its environment.

[3]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.

Taitchi Ohno of Toyota, based his thinking on supermarket operations in the USA. The relatively low levels of stock in these operations provided the foundation for the JIT pull system.

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:[4]

(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 companys' 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!).

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.

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.

[4]Based on Watson (1993) and the Xerox methodology (see Camp 1989). A more detailed supply chain benchmarking methodology, developed by the author (Sweeney 2003), is contained in the Appendix to this chapter.

Robust performance measurement systems need to be designed to measure and encourage the key overall supply chain objectives of customer service and 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 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 have 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 a 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 Lynch and Cross (1991). This pyramid (see Figure 15.1) 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.