

Benchmarking

Productivity and Service

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Abstract

This paper discusses productivity and service in metros. It looks at what is benchmarking, the processes involved and the key pre-requisites for successful benchmarking. Finally it emphasizes the importance of the concepts of service, efficiency and effectiveness and how they contribute towards a metro's performance.

My First Productivity Comparisons

Some 25 years ago, I was the Chairman of the Finance and Commerce Sub-Committee of the Metropolitan Railways Committee of the International Union of Public Transport (UITP). I wrote a paper, with Hans Meyer of Hamburg, on productivity comparisons between metropolitan railways (Ridley and Meyer 1983). We collected data over a five-year period (1977-81) from 26 metros in order to carry out our analyses. The most detailed analysis was carried out on the data from Hamburg and London. Many comparisons were made in the paper that gave insights into the respective performance of the metros in Hamburg and London (see box story on “Productivity Comparison between London and Hamburg”).

Clearly, different systems operate in quite different environments, which may make simple comparisons invalid. Such examples include the level of subsidy provided to the operator; the passenger markets in which they operate; the nature of the labour market; and the extent of capital infrastructure already in place. However the actual numbers, and the rankings in any “league tables” developed, are not the object of the exercise. The essential question is how we learn from the numbers, the questions that are stimulated by them

Productivity Comparison between London and Hamburg (Ridley and Meyer 1983)

We started with one basic statistic concerning the overall performance of the metro - *passenger revenue/total cost* - and then broke it down into its component parts. This made clear the important fact that a system that performs well on one criterion may perform much less well on another.

Two sequences were defined and studied:

- *Passenger revenue/total cost*

$$= \frac{\text{passenger revenue}}{\text{passenger km} \times \frac{\text{passenger km}}{\text{train km}} \times \frac{\text{train km}}{\text{total cost}}}$$
- *Train km/total cost*

$$= \frac{\text{train km}}{\text{staff numbers}} \times \frac{\text{staff numbers}}{\text{staff cost}} \times \frac{\text{staff cost}}{\text{total cost}}$$

Figures for 1981 were then put to each of these ratios. Hamburg was indexed against London (= 100) and the results for Hamburg were:

- *Passenger revenue/passenger km* = 31,
 i.e. the revenue ratio in Hamburg was 3/10th of that in London
- *Passenger km/train km* = 122
- *Train km/staff numbers* = 233
- *Staff numbers/staff cost* = 89
- *Staff cost/total cost* = 73

Thus

- *Passenger revenue/train km* = $31 \times 1.22 = 37$
- *Train km/total cost* = $233 \times 0.89 \times 0.73 = 151$
- *Passenger revenue/total cost* = $37 \times 1.51 = 56$

On the basis of admittedly imperfect data, we concluded that Hamburg was 63 percent less effective in its revenue earning capability per train-km than London. This is not surprising given the much higher fare levels in London. Hamburg, on the other hand, was 51 percent more effective in the cost productivity of train running (train km/total cost). There were many more comparisons in the paper that gave insights into the respective performance of Hamburg and London.

and the self-examination engendered, leading to improved performance. These comparisons are much less a question of competing with others, rather of competition with oneself.

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At that time I was Managing Director of London Underground. To me, the principal value of the work was to encourage a more searching examination of our own performance on the Underground, which dates back to 1863. No amount of special pleading about age, size, tunnel diameter or corridor length could hide the fact that, on a number of measures, Hamburg outperformed London.

A visit to Hamburg followed and the lessons learned were built into the London Underground's strategic planning process. This focused a whole series of initiatives that involved changes in the company culture and culminated in changes in Board structure. The work with Hamburg also formed part of the basis to develop the case for more investment in the Underground, of which the latest example is the decision of the UK Government in October 2007 to proceed with the massive £16 billion Crossrail project – 25 years after it was first mooted.

Several years after my work with Meyer, after becoming an academic, I resumed my interest in the topic of the paper we wrote. By this time “productivity comparisons” had given way to the term “benchmarking”, now used worldwide within a variety of disciplines and businesses.

What Is Benchmarking?

In 1989 an employee of the Xerox Corporation in the USA (Camp 1989) wrote a paper that defined “benchmarking” as the search for industry best practices that leads to superior performance. Xerox, which had been in a fierce competitive battle with the Japanese, saw its earlier outstanding performance being undermined and its market share and profits declining. Analysis suggested that both their quality and productivity were falling behind to a frightening extent. Their reaction was to introduce a strategy of

“total quality”, based on a study of best practices among their competitors. Other firms in other industries quickly followed suit.

Benchmarking has been described (Burgess 2000) as “a structured approach to finding ways to improve an organisation’s performance” and/ or “a technique used to target key areas for improvement in order to increase productivity, quality, customer

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satisfaction and, where appropriate, competitiveness”. It involves comparing financial and operational performance with those of others, either internally between departments or sections, or externally with other organisations.

It is important to recognize what benchmarking is not. It is not about the creation of league tables. Rather, benchmarking is about stimulating “why” questions; identifying strengths, weaknesses and trends; setting targets for improved performance; and, in some cases, it can support dialogues with government, regulators and other stakeholders (subject to confidentiality).

In many industries today, comparison of business processes lies at the heart of benchmarking. The need for data collection and comparison can lead to an erroneous focus on the production of “league tables” showing who is better than whom. In fact, the essence of benchmarking is to create new attitudes that will lead to superior, or at least improved, performance. The proper question is not “how do we look?” but “what shall we do?”. Where any organisation appears in a “league table” will of course depend on managerial performance, but it will also depend on history and many other factors.

It is hardly surprising, for example, that Singapore’s Mass Rapid Transit (MRT) shows superior performance to London Underground when we consider the age of the Underground, and what the designers of Singapore’s MRT had learned from the experience of others over the previous century. The issue is—what lessons can London learn by examining processes in Singapore or, indeed any other city, and vice-versa? There is much that managers can learn, but it is also true that no amount of managerial

excellence can overcome, for example, neglect of replacement investment over the years.

It is also the case that, where a series of data is collected and analyzed, one organisation may be “better” than another on one measure but be “worse” on a second. Furthermore, an organisation with “superior” performance might still have much to learn, or at least insights to gain, from an examination of the processes of others. This is particularly true where its assets are relatively new. Inspection of the performance of older systems, where replacement has been neglected, can provide salutary lessons.

Benchmarking “clubs” most often include organisations from the same, or similar, industries. This is because the processes employed are likely to be similar and therefore easily comparable. However, lessons can also be learned across industries. South-West Airlines in the United States reputedly learned much by studying the rapid turnaround of complex equipment at pit stops in motor racing. In addition, benchmarking may be carried out by comparison within an organisation. It is probably easier to arrange but obviously less likely to bring in the “fresh air” of outside thinking.

Xerox’s benchmarking process has been described as follows:

- *Planning* - identify what is to be benchmarked, identify comparable companies, decide data collection methods, and collect data;
- *Analysis* - identify performance gaps, project future performance level;
- *Integration* - communicate findings and gain acceptance, establish functional goals; and
- *Action* - develop action plans, implement actions and monitor progress, recalculate benchmarks.

This last step—recalculate benchmarks—is instructive, with its emphasis on constant improvement. Benchmarking is not a one-off action. Except in the case of internal comparisons, information will be shared between competitors who

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commit to collaboration for mutual advantage. Apart from the inherent benefit of learning from each other, this can also help to “grow the market” through industry-wide improvement.

Successful Benchmarking

A fundamental pre-requisite for successful benchmarking is commitment to organisational change. Because the management of change requires commitment and leadership from the top, benchmarking should clearly be seen to have the support and drive of top management. Hence, it is critical to have *strong commitment from top management* to act on any major opportunities for improvement as they are revealed. To prevent benchmarking becoming an academic “snapshot” of how you are performing, senior management needs to own the process and be seen to be steering it.

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To be successful, it is essential that senior managers decide what is the mission of the organisation. This is crucial to provide all employees with a clear idea of the objectives that are to be attained. It should be communicated to everyone in the organisation in clear and unambiguous language.

It is then necessary to translate the mission into critical success factors (CSFs) and key performance indicators (KPIs). The CSFs provide a focus for what people will be aiming to achieve to ensure that the mission is successful within the allotted period, while the KPIs provide targets to assess progress towards achievement of the CSFs.

To ensure that improvements can be implemented, it is essential that each CSF and KPI is considered with direct respect to the day-to-day processes that are carried out. Unless what happens within the processes can be changed effectively, the likelihood of being able to show that the KPIs have improved will be reduced. Thus, KPIs should be developed in consultation with those people who are directly involved in carrying out the processes. Those people who have direct involvement with the sub-processes, activities and tasks should also be consulted.

Because benchmarking regularly involves partnerships between organisations that may be competitors, often using confidential information, a *high degree of trust* is equally important in ensuring a successful benchmarking. Thus the partners have to work out a formal method of working.

Finally, it is also crucial that managers understand three aspects of productivity performance, i.e. those that are:

- Under the control of the organisation;
- Inherent in the cost structure of the industry; and
- Pertain to the particular geographic and economic circumstances that a metro operates in.

Given that transport is a highly politicized occupation, managers need to understand these distinctions if only in “self defence” against their masters.

My simplest example of this relates to a comparison of the financial fortunes of the two metro operators in Hong Kong and Singapore, i.e. Mass Transit Railway Corporation (MTRC) and SMRT Trains Ltd (SMRT) respectively. Both Hong Kong and Singapore have world class metro systems. In Hong Kong, MTRC’s revenue has covered the metro’s operating, maintenance, renewal and construction costs. In Singapore, construction costs were not covered by SMRT’s operating revenue. Does this mean that the people in Hong Kong were somehow better than the people in Singapore? Not at all. The circumstances are very different, including the urban densities and the different financing frameworks. The point is that both Hong Kong and Singapore defined their own objectives in their own context and met them—but importantly, met them in an affordable way.

Service

All of the discussion so far has focused on what the engineer or the operator can do to make their system, or their project, more productive or efficient. But this, on its own, is “old engineering”. Today’s engineers and operators recognize that the economic concept of supply and demand is essential to their task. Thus service to the customer becomes paramount. Other engineers may have to deal with the complexities of steel, concrete, water, electricity and the like. Those of us in the transport business have to deal with the most difficult “material” of all—people.

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Originally the ethos was that of *production*, but it moved on to that of the *market*, whereas now the emphasis is on *service* (Ridley 1996).

What is a service? It is essentially a process. It is not physical in contrast to a product, and cannot be stored since it is produced and consumed at the same time. Another characteristic of a service is that the customer becomes part of the service process. It has taken some time for engineers, indeed many operators, to comprehend the crucial differences between production and service.

If, as I believe, the task of engineers or operators is to “get things done”, then we need to look at other aspects of productivity and service. We not only need to get things done “well”, i.e. be efficient, we also need to get the “right” things done, i.e. be effective. There is a strong tendency to confuse efficiency and effectiveness. *Service efficiency* is often the primary concern of the “government customer” while *service effectiveness* is clearly of concern to our “passenger customer”. There is no merit in having efficient, but ineffective, public transport (because, for example, it is in the wrong place); nor in an effective, but inefficient, public transport that costs too much but attracts low ridership.

If we are to focus on both the government and the passenger customers, then we must be both efficient and effective and provide a service that is cost effective, i.e. one that meets customer needs at an affordable price—in terms of fares or subsidy or both. Service efficiency may be measured by the level of service output relative to the resource cost of inputs, while service effectiveness may be measured by the demand for use of the service relative to the level of service output. A *cost effective* service has attributes of both.

Consider the following service measures:

- *Cost effectiveness*
- *customer demand/ resource cost, say passenger km/ staff numbers*
- *Service effectiveness*
- *customer demand/ service output, say passenger km/ train km*
- *Service efficiency*
- *service output/ resource cost, say train km/ staff numbers*

The relationship between them is indicated by the fact that:

- *Passenger km/staff numbers*
= *passenger km/train km x train km/staff numbers*
i.e. *Cost effectiveness = Service effectiveness x Service efficiency*

A standard measure of system performance is the cost recovery ratio (CRR), i.e. the ratio of revenue to total cost. But all simple measures represent a complex combination of other performance measures. A particular CRR is not necessarily “good” or “bad” since it will be affected by both policy decisions and managerial performance. Not least, of course, is the fact that revenue is clearly a function of fares policy. Thus,

$$\begin{aligned} \text{CRR (revenue/total cost)} = \\ \text{revenue/passenger km} \times \text{passenger km/train km} \times [(\text{train km/staff numbers})/ \\ (\text{staff cost/staff numbers})] \times \text{staff cost/total cost} \end{aligned}$$

Therein lays the impact of service effectiveness (passenger km/train km) and efficiency (train km/staff numbers) on the performance of a metro.

Conclusion

An understanding of performance, based on comparisons with others, can bring great benefits to organisations if they proceed in a measured way. In particular, they should treat comparison as a self-learning process from which actions must follow if improvements are to be achieved. Besides making comparison on technology and production, it is increasingly important to focus on the service

that metros provide to the public to ensure the delivery of a cost effective service which satisfies both the government and passenger customers.

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