Benchmarking and Performance Measurement: The Role in Quality Management

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1.0 INTRODUCTION
Benchmarking represents an evolving component of modern management practice as part of the total quality management [TQM] operation. Not unsurprisingly the shift to TQM coincided with the development of management strategies driven by the objective to satisfy customers rather than simply minimize cost and assure supply. This fundamental paradigm shift that shaped other industries in the 1980’s is now affecting the role and management of transportation service providers and more recently those that supply infrastructure services, such as airports. Airport benchmarking, for example, can provide management with comprehensive data and a consistent analytical methodology so they can utilize the power of benchmarking for operational decisions and long term strategic planning. Throughout this chapter I use airports as an example of the benchmarking process but the concept is applicable across all public and private modes of transportation and to other industries as well.

Total Quality Management is a business philosophy as well as a set of guiding principles founded on the notion of customer satisfaction. It involves designing the organization to satisfy customers every day. It generally is comprised of two strands, careful design of the product or service and ensuring that the organizations system can consistently produce the design. Quality management is both a cause and consequence of the structural and behavioral changes that have characterized a majority of sectors in the economy in the last fifteen years.

This chapter examines the management practice of the integration of new quality management techniques with the adoption of a customer orientation and a shift away from functional management. An additional theme contained in this chapter is the development of performance measures and the comparison of these measures with those regarded as the ‘best in the business’. This process is formally known as benchmarking and is a central part of quality management.

The key proposition in benchmarking is that ‘what gets measured gets managed’ and that without measurement there will be no sense of the incremental gains or costs of undertaking quality improvement. Without quality improvement in the new economic environment, the success of a firm, even for traditional commodities, is questionable. In the absence of performance measures and benchmarking, management cannot defend itself against criticism, quantify shortcomings, articulate its accomplishments or develop sustainable strategies in the modern world of broadening competitive markets for goods and services including transportation. Indeed, measurement will identify the ‘enablers’ or drivers, the processes and practices that make the ‘best-in-class’ performance possible. There must therefore be a [dynamic] set of measures that track the performance of the

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1 Improving productivity and efficiency are two factors that drove business decisions up to the mid-1980s and led to organizational structures that were very much engineering driven set of functional relationships. The traditional value-chain in an airport, for example, ran from airport marketing to airport operations and maintenance, terminal and cargo management and concession management. As we shift to a consumer driven business strategy, the value chain leads to an organization that is structured on the basis of customer value-adding activities; marketing, quality management for airside and landside and commercial management.
integration of firm activities and provide the input into any benchmarking exercise, which identifies the reasons for the excellence. Total quality management [TQM], benchmarking and performance measures are an important part of the larger organizational framework. They are integrated methods of achieving the strategic goals of the firm.

Benchmarking identifies centers of excellence within an organization and superior business practices and processes used by other organizations and competitors to increase revenue reduce costs as well as deliver quality to their customers. A benchmark will affect every level of the organization from senior management responsible for strategic planning to operations management to finance and marketing. To be effective benchmarking must be integrated with management tools and performance measures that link management to firm economic performance. To accomplish this any benchmark must provide consistency and take account of the diversity in airport scale, structure and operational activity to ensure the comparisons are reasonable and accurate.

2.0 TOTAL QUALITY MANAGEMENT AND COMPETITIVE STRATEGY

Quality management requires attention to the whole production and delivery system. The modern consumer, passenger or shipper, wants and expects value for money - the right products, latest technology, high quality and the ‘right’ price. This does not mean that costs should be minimized, or quality maximized, but rather the sum of firm and customer costs should be minimized. For example, airlines have traditionally viewed airport services as cost centres. A modern approach would seem airlines and airports as strategic partners. These are the new demands, which illustrate the need for the introduction of TQM into the transportation sector, particularly infrastructure services, and that the perceived trade-off between price and quality has shifted.

The fundamental differences between the old and new view of quality in the strategy of the firm are illustrated in Figure 1. In this perspective an investment in quality can add value for the customer. This value creates a margin that a supplier can exploit in whole or in part. In addition, by investing in ‘quality’ TQM can, and generally does, generate cost reductions for producers: reduced waste, increased productivity and improved efficiency and for the customer reduced operating and transactions costs. There is also the opportunity to increase revenue since the demand for the product has increased because of the higher quality.²

Figure 1 also reflects the essential components of quality management. The shift from a supply to a customer focus requires a clear vision of the objectives and a consistency of purpose for service. Adding customer value cannot be accomplished at any cost nor with a reliance on the old sources of cost economies such as scale and utilization economies. The process must be redesigned to minimize system costs by examining each process and the alternatives available (e.g. make vs. buy) as well as the integration of the processes - what may minimize the cost of a particular process but may not minimize overall costs.

² By adding quality, customers see value in the product and this value is rent. The rents can be shared, in some distribution, between customers and producers. It is more cost effective and therefore important to retain a satisfied customer than it is to compete for new ones.
A customer orientation is human capital intensive and this requires an investment in human resources. Motivation is going to come from a commitment to the organization and contracts that provide incentives with a reward structure that is positive. This means eliminating targets or quotas as the motivation for production. Finally, quality management involves a continuum across the vertical chain of production and distribution. This means each stage of the production and distribution process will have to buy into the transformation to quality management (suppliers, labour, management, and customers). In order to accomplish quality management we therefore need an information system, which provides the initiative for change, a platform for continuous improvement and the basis of communication.

**Figure 1**

CUSTOMER PARADIGM SHIFT: FROM SELLER TO BUYER POWER

<table>
<thead>
<tr>
<th>Old</th>
<th>New</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. productivity and quality conflict</td>
<td>1. increasing productivity with improved quality</td>
</tr>
<tr>
<td>2. quality defined by conformity to some standard</td>
<td>2. quality is defined in terms of meeting user needs.</td>
</tr>
<tr>
<td>3. quality measured by degree of non-conformance</td>
<td>3. quality measured by continuous user satisfaction</td>
</tr>
<tr>
<td>4. achieve quality with inspection</td>
<td>4. quality determined by product design and achieved via effective controls.</td>
</tr>
<tr>
<td>5. some defects allowed</td>
<td>5. defects prevented through process controls.</td>
</tr>
<tr>
<td>6. quality is a separate function</td>
<td>6. quality is part of every function.</td>
</tr>
<tr>
<td>7. poor quality is blamed on a specific input (labour)</td>
<td>7. poor quality is a management responsibility</td>
</tr>
<tr>
<td>8. supplier relationship are short term and cost oriented</td>
<td>8. supplier relation is a long term and quality oriented.</td>
</tr>
<tr>
<td>9. inspection equals quality</td>
<td>9. quality is continuous improvement</td>
</tr>
<tr>
<td>10. focus is short run profits</td>
<td>10. focus is long term survival (discounted NPV)</td>
</tr>
</tbody>
</table>

**3.0 BENCHMARKING AND PERFORMANCE MEASURES**

**3.1 Benchmarking**

What is benchmarking? It is a process of continuous measurement, internally and externally, and comparison against established external best practice leaders to obtain knowledge to improve performance. What is the role of benchmarking? "It is an instrument for providing a reference point". A simple straightforward definition such as this makes clear the specific role of benchmarking as a means of creating attention and momentum for change. It is a process of internal performance measurement and external monitoring of industry leaders. The definition also identifies the linkages between benchmarking as an instrument and its relationship to or within other quality management methods. Benchmarking should be broadly based and not limited to technical areas (e.g.
engineering and finance). It should also be considered to be part of continuous improvement to insure internal processes are designed and functioning to achieve ‘market’ success; ‘best practice’ refers to the best way of meeting customer’s needs while minimizing system costs.

Any firm, whether in the transportation sector or not could be a benchmark for a particular process or product for a transportation firm, regardless of how large it is. It is also possible that businesses outside the industry might provide the standard or ‘best-in-class’. A quite famous example of corporate benchmarking occurred with Xerox. This firm had a very good distribution system but because distribution was a major component of overhead costs, management sought to hunt for savings and quality improvements. The benchmarking process led Xerox to look at the process of distribution in other industries besides the copier industry and L.L. Bean, a mail order firm, was identified as best for warehousing and distribution. The case study of their operation identified the enablers which included greater use of computer directed activity including bar-coding to assist automation, items being arranged by turnover rate, continuous service to incoming orders and incentives to employees for higher productivity and order filling accuracy. Xerox was able to take this knowledge and apply it in their context to improve their performance.

There is a clear difference between a Performance Measure and a 'Benchmark'. The former provides a continuing measure of productivity, cost efficiency, operating excellence or level of quality and service delivery. A Benchmark on the other hand is a point of reference or target. A Benchmark can refer to a core functional area (such as production), a support area (finance), business process (product design), sub-function (billing) or even specific task (receipt recording). Once the benchmark has been identified, the performance measure evaluates progress in achieving it.

In order to Benchmark it is necessary to fully understand the process or activity and how well it performs. This means the firm [airport] must first undertake an intensive internal analysis using quantifiable measures such as throughput, product quality, customer satisfaction, equipment setup times and availability of inputs. From this point the analysis should move to a more detailed study of how an area operates. This raises questions: what exactly is the nature of the work (tasks); what are the constraints the area is operating under; what are the strengths and weaknesses. It is at this point ‘performance measures’ become the vehicle for translating the information gained from benchmarking into improved or superior performance.

The purpose of the measures is to supply firm and area management with indicators that will assist them in providing a superior service to their customers and to do so in a cost efficient way while pursuing their mission objectives. This move to performance evaluation, productivity assessment and 'benchmarking' by large numbers of firms across a wide variety of industries is recognition of the fact that the link between a firm's performance measuring system and its actual performance is strong. What gets measured gets managed but measurement is not sufficient for success, it must be utilized through benchmarking. To evaluate the extent to which an organization recognizes this principle, the manager should ask:

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3 The 'area' could be defined as functional, operational or product.
how can the ongoing efforts to meet a firm’s goals be evaluated?
how can people be encouraged to improve the firm's performance?

As illustrated below, benchmarking can be broken out into a number of steps, in Figure 2 we have illustrated six. The first requirement is to identify the best performers and those processes set the standard. Once a point of reference is chosen, we have to measure the difference between the standard and the firm’s performance. In the process of measurement, comparability must be maintained. Transitory effects must be considered, as must the differences in the context. This gap can be converted into an objective and the objective, in a given planning period, need not necessarily be closing the gap in one step. Thus, the benchmark objective need not be to move immediately and directly to the standard of the best performer but a shift in performance by an amount that is challenging yet attainable. Trying to move to ‘best of class’ in one move may frustrate the entire process.

Once the differences in performance between the firm and the standard are measured and the benchmark has been set, the next step is to discover the enablers of the firm. The enablers or drivers are those activities that move the firm from its present state towards ‘best in class’. The decision of how much of the gap to close over a given time period will be determined very much by the enablers and whether the benchmarking firm decides it must make fundamental changes to its processes and organization. What remains is to implement the change. This is a non-trivial exercise since change always threatens some people and firms. Throughout the benchmark process, communication among the participants is essential to success.

Figure 2
THE STEPS IN BENCHMARKING

Benchmarking: a 6-step approach

- Best Performers Identification
  - On each step of the value chain
  - Internally (in each company)
  - Externally (amongst companies)
  - Historically

- Gap Measurement
  - External standards
  - Macro and micro-gaps

- Improvement Potential
  - Adjust the data to make performance comparable

- Best Practices
  - Identification of important actions undertaken which lead to these best practices

- Consensus Building
  - Reach agreement on new targets

- Implementation

Communication
3.2 Performance Measures

Because airports and other forms of transportation infrastructure have traditionally been perceived as public utilities, planning and engineering have influenced management practices more than modern business methods. In other words, a supply side outlook was reflected in the view that bringing a homogeneous commodity (seat miles, vehicle miles, ton-miles, available runway capacity) to market was what was important. As a result traditional management was operations oriented and would divide the firm, an airport for example, into sub-systems - operations, administration and leases & concessions - and then into functional areas. This approach, however, ignores the customer orientation of new business management. Specifically, the perspective of ‘airports as a business’ and the introduction of new management tools such as TQM and benchmarking has been garnered from a competitive strategy perspective in which the objective is to meet customer needs and add value to customer services.

As airport ownership and organization are evolving from purely public ownership and management, the importance of developing competitive strategies has taken on increasing importance. The focal point of these strategies is the customer, which include passengers and cargo agents, the carriers and other airport operations. The fundamental change is one from a functional management orientation at the airport to a customer driven service in which the airport is not considered a cost center for an airline but as a strategic partner in supplying inputs. It is, therefore, essential to place the exercise of performance measurement into the broader context of competitive strategy.

The selection of a process to measure and to compare with best practice must be related to a strategy that is directed at the core businesses of the firm. The vision or mission of the firm [airport] must drive the selection of what to measure and how to measure on a continuing basis. This is a key contribution of TQM - describing a set of guiding principles which focuses on careful product/service design and assurance that the design can be produced consistently for those products or services which the firm [airport] views as its primary business. However, this is an interactive process meaning that dynamic vision will force new strategies which will in turn drive the need to develop new performance indicators.

4.0 LINKING PERFORMANCE MEASURES, ENABLERS AND STRATEGY

To summarize what has been described thus far, benchmarking is a process of moving the firm in a mode of continuous improvement. Once the firm has identified the standard or ‘best in class’ of a particular process or service, it establishes a benchmark or target for the firm to achieve in a given time period. As improvements take place and strategies change the benchmark is continuously adjusted. In order to successfully complete the benchmarking the firm needs information both on how well they are doing as well as how the improvements can be achieved. This requires the development of performance measures and the identification of the enablers. Enablers, which are practices, processes or methods, are the means by which superior performance is achieved. Benchmarks provide the level of excellence while enablers identify the reasons behind the success and how the process was implemented.
The mechanism identified for linking strategic, managerial and operations and customer views is illustrated in Figure 3. In setting out the core indicators, a hierarchical relationship has been established running from micro based activity measures and rising to global airport measures. The core indicators can be thought of as a subset of measures used at the global level (A), that summarizes the core activities of the firm. For an airport this would include operational, financial and costing indices for aircraft operations, numbers of passengers and cargo and community accessibility.

Using the framework illustrated in Figure 3 the most basic micro level performance indicators for each activity in each business area in the transportation firm are identified as activity measures (C). At this level the measures define activities in terms of their physical [productive] capacity that is supplied at a given time and level of utilization. In and of themselves these are not of strategic value but they do identify the enablers, the drivers of performance. For example, the maintenance schedule for baggage belts is an operational issue but will be influenced by the importance of hubbing at the airport.

At level, "B", the Strategic level, performance measures are identified which managers of the customer driven management areas could find valuable in running their area, in integrating with other operational areas and in collectively providing information for senior management policy and direction. These measures, continuing with the airport example, encompass revenue generation, financing, operational and cost indicators, which are of strategic importance to the area and strategically to the whole airport. For example, at an operational level the 'Parking System Downtime' can be identified, Available Capacity and Turnover Rate of Vehicles [in available spaces] as activity measures of capacity supplied and used. At the "B" level the 'Revenue per Space' and Revenue per Vehicle' are income performance measures which have strategic value since they not only indicate how well the parking functional area is generating revenue but it perhaps indicate a need to institute changes in either the level or structure of parking fees. These measures are also of value at the "A" or global level, discussed below, because parking revenue is one component of total airport revenue. An increase in parking revenue could mean less would be required of other areas such as carrier terminal fees which would reduce the entry costs of new carriers to the airport; if expanding the number of carriers was a desirable strategy of the airport managers.

At the "A" level are the global performance measures, which are generally compared across airports but can certainly be compared over time for a given airport. At this level, it is the airport CEO with the Board of Directors who have collectively identified the mission of the airport and the set of indicators that will be benchmarked to serve as a measure of how well the airport is doing. The "A" level performance measures provide information on the success or lack thereof of strategies pursued. At this level the measure can refer to a process, the number of passengers per gate, for example, or an aggregate measure for the total airport, rate of return on assets for the total airport. The "B" level performance measures provide the foundation for changes to the global indicators and the activity level measures supply the enablers for the "B" level measures.

For example, it is commonplace to compare, across airports, the aggregate number of operations, operations per runway or operations per meter of runway. This provides a

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4 In this sense they are similar to activity based costing measures.
measure of runway capital productivity, a coarse measure of service accessibility to the community and a measure of the success of the strategies pursued by the airport CEO. However, the manager of airside facilities (runways, taxiways, ramps and parking aprons) would also focus on the processes by which the number of hourly or daily flights could be allocated or increased; 5 available capital (square meters of airside capacity), usage rate of the capital, availability of capacity, Air Traffic Control (ATC) operations, airline scheduling decisions and pricing of airside services. These latter measures are "B" level and are under the purview of the airside management. This manager must examine the activity measures to determine how they might affect the amount of airside capacity available. This may include changes in maintenance or snow clearing procedures or priorities, repair or maintenance programs.

For each level of a performance measure, the categories are financial, cost efficiency (or expenses), marketing and revenue generation and operations. The purpose in defining these categories is to emphasize the concept of the measurement, which can be applied across the different airport activities. For example, one might consider the activity of moving aircraft from landing runway to gate and assess the airports’ performance in terms of the financial return, the revenue from landing fees (hence rate structure), the number of operations per use of airside facility (productivity) and simply the average time from landing to gate. Alternatively, one can assess this activity for only one performance dimension but consider it as an operational activity, as part of airside management and a comparison across airports.

In constructing and reporting performance measures the following are important. First, each measure should be reported in three forms; the [arithmetic] mean, the median and the standard deviation. The reasoning is that a simple mean, which is commonly used, provides no information on the variability of the data. The median is not subject to the influence of extreme values in the data. The standard deviation is a measure of data dispersion around the measure of central tendency, the mean. A high standard deviation is a signal that the data are widely dispersed and have a broad range. The information content in any one piece of information will therefore be lower than when the standard deviation is lower. 6

Second, data should be provided for a time-series since reporting for only one year can be misleading. The data point may be an outlier and contain significant transitory influences. Furthermore, time series is essential to track progress over time.

Third, all data should be expressed in real terms. All financial data, costs and revenues should be adjusted by a price index to remove the bias of inflation, particularly if inter-country comparisons are made. Which index to use is open to question since a capital price index may be appropriate in one circumstance whereas a wholesale price index may be more appropriate in another. Nonetheless, comparisons in constant or real dollar terms are essential.

5 We can set aside for the moment that the airport CEO in conjunction with their directors may wish to pursue alternative strategies of maximizing the number of carriers and flights, which use the airport, or it may wish to focus on a key client such as a hub carrier and develop airport strategy in conjunction with the carrier’s strategy.

6 In a normal distribution the 68% of the data are plus or minus one standard deviation from the mean and, 98% of the data values are ± two standard deviation units from the mean.
Finally, the context in which the data are collected is important to understand their level and structure. Significant economic and institutional events need to be recorded since they can result in swings in the data which have no relationship to what strategy has been followed or how productive some inputs were.

**Figure 3**

The Integrated Tiers of Benchmarking & Performance Measurement

- **CEO & Board of Directors**
  - Global Performance Measures (A): inter and intra airport comparisons

- **Benchmarking Information**
  - Strategic proposals for new service development
  - Strategic proposal for service delivery
  - Strategic investment proposals & expected ROI
  - Strategic revenue management
  - Benchmark financial performance

- **Enablers**

- **Operations**
  - Strategic Performance Measures (B): intra and inter airport comparisons

- **Performance Measures**

- **MARKETING & REVENUE MANAGEMENT**

- **FINANCE**

- **ACTIVITY MEASURES** (C)
The process of developing and implementing performance measurement and benchmarking is an evolutionary process. It is an exercise in identifying the information needs and developing information systems that will generate the data in a friendly, usable and broadly accessible format. Initially, the exercise is important in evaluating the transition to a new internal organization while later it can be used in evaluating and implementing strategies. The performance measures also form the basis of a 'Report Card' to the community to show what has been done with the transportation resources.\(^7\) This should be provided on an ongoing basis to track the evolution of strategies and operations.

A useful and effective performance measure should be judged on the following criteria:

- Does the measure track performance and offer insight into the sources of change?
- Do the measures provide ex ante guidance rather than simple description?
- What is the value added of the measure?
- Can the measure be realistically quantified?
- Is the measure complementary with other indices? Are they jointly determined?
- Can the measure be calculated with readily accessible data on a continual basis?
- Are task or sub-function indices easily aggregated?

### 5.0 IMPLEMENTING BENCHMARKING AND PERFORMANCE MEASUREMENT

Benchmarking can be applied at any level within the firm whether to projects, profit centers or processes. Clearly, the data requirements will differ as will the commitment of resources. An internal benchmarking exercise is a valuable first start in learning the process. Benchmarking can also be external to the firm where activities in other industries or firms within the same industry may provide the ‘best in class’ model.

The benchmarking exercise should include the following steps. First, develop a model for placing benchmarking in the larger context. Any activity that is to be benchmarked is part of an integrated set of processes and is affected by the vertical linkages between processes. This context cannot be ignored in the benchmarking exercise or in using the results. Second, identify participants in the benchmarking activity. Training is required for the benchmarking team. The process of benchmarking, overview training and the process knowledge are needed to provide guidance. Since benchmarking is not an isolated exercise but is part of a management philosophy, the benchmarking team must extend beyond those who have responsibility for what is being benchmarked. It should include members from senior management. Third, identify key issues related to implementation of organizational changes. To use and benefit from benchmarking, a cultural change is required. Benchmarking is, in essence, using a form of market to check on the activities of a firm, which are not normally judged, by an external market.

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\(^7\) This is similar to the idea of the balanced scorecard (Kaplan and Norton, 1992), which organizes financial, and non-financial performance measures around four perspectives: customer, internal, financial and innovation. It is motivated by the objective of multiple perspective approach that overcomes incompleteness when measures are one-dimensional.
addition, having ‘world class performance’ in one or a few processes but not all will not improve the position of the firm. World class in all areas is needed.

6.0 SUMMARY

Performance measures are the information base for strategies to meet customer needs, improving productivity and enhancing competitiveness. Quality management in turn is founded upon performance measurement systems linked to benchmarking. Performance indicators (measures) are the basic building blocks in the evolution and provide the fundamental inputs to the analytical process by which the enablers are identified.

Management needs to establish yardsticks to track improvements and to see if stakeholder requirements are being met. Managers are dealing with a continuous improvement process and they need to ensure consistency with strategies. While the principles of quality management and continuous improvement should be encapsulated in each performance measure, the system of measures must provide practicable management tools. As a result they should possess several important properties. First, they should measure and not evaluate. Performance measures are the input to the evaluation. Second, they should not place excessive emphasis on precision since we are trying to discover how and if we are improving. Thirdly, any activity requires multiple indicators since no one measure tells the whole story. Furthermore, the range of measures should include an assessment of all inputs and not focus exclusively on labour. Fourth, the measures should blend quantitative and qualitative elements. Not all activities are easily reduced to numbers and scales and indexes may need to be created. Finally, incentives should not be tied to standards but rather to the improvement relative to the established benchmark.

Standards act as targets and the theme of quality management is continuous improvement. The metrics need to cover the following dimensions of business activity:

- **achievement metrics** - direct indicators including financial operating, costing measures;
- **diagnostic metrics** - indirect measures that assess critical success factors such as customer satisfaction, product quality and reliability, cost efficiency and flexibility;
- **competence metrics** - measures, which describe how well prepared the airport is for the future such as investment in product development, diversification and training.

Benchmarking is a powerful yet quite simple management tool since it is transparent, accessible to front line workers as well as CEOs. It motivates and provides direction for action. However, it must be integrated into the management of the firm. To be effective, benchmarking requires a combination of detailed, and sometimes difficult, analysis in conjunction with determined leadership that is capable of setting targets and implementing effective programs.

Benchmarking has been undertaken in a large number of industries where firms have made a change to quality management principles and practices. There are a number of key lessons that emerge from their experience. First and foremost there must be commitment from the senior levels in the organization. If these upper management levels do not sponsor the benchmarking exercise, there will be a lack of credibility, commitment and support. Second, the benchmarking team must reflect the purpose of the exercise.
That means it must reflect excellence from the chairperson on down. The chairperson must be a champion and provide the leadership throughout the process. Thirdly, planning is essential. This means a carefully laid out process, which is documented at every step.

The benefits of benchmarking to an airport or highway authority or port can be far reaching. The airport industry, for example, is a reflection of the airline industry; it is dynamic and rapidly changing. This change within the industry and the role aviation is playing in the new economy with its emphasis on e-commerce and supply chains has created the need for airports to analyze their operating performance and evaluate their competitive strengths. Benchmarking can serve as a critical management tool in this pursuit. As more pressure is brought to bear on the airport to meet customer needs, it can be used to identify centers of excellence within an organization and superior business practices used by competitors and other organizations to increase performance and facilitate change. Benchmarking will prove valuable at each level of the organization from senior managers through operations, marketing, and finance and product development.
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