Performance Benchmarking for Water Utilities [Project #164]

Ordering Information:
ORDER NUMBER: 90710
DATE AVAILABLE: Winter 1996

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BACKGROUND
Professionals in the water industry are always seeking to improve their performance, whether by lowering costs, enhancing revenue collection, increasing the level of service provided to customers, or all of these. The main goal of this project is to demonstrate how to apply benchmarking in actual practice to performance issues in the water industry. To meet this goal, a lot of new data was not collected. Instead, sufficient data was collected to demonstrate the methods that utilities may use in undertaking a benchmarking study.

Water practitioners are shown how to do performance benchmarking by going through all the steps in the process. Preliminary lists of measures are provided that can be adopted by utilities to assess their performance. A set of quantitative performance ratios was developed that can be used by the practitioner to compare their performance with that of the utilities which formed the data set. A series of performance models was also developed so that a utility can enter their own data in order to compare their performance to that of an "averagely performing utility" faced with the same data values.

Finally, a case study is used to show the reader how to go about making performance improvements using a technique called process benchmarking.

OBJECTIVES
This research project set out to help facilitate the use of performance benchmarking within the water industry by meeting the following objectives:

- To identify those water utility processes suitable for benchmarking
- To illustrate the use of metric benchmarks by quantifying a limited number of possible benchmark measures
- To investigate the availability of key data for metric benchmarking
- To identify data shortfalls and to prepare a program for its collection
- To investigate the extent of, and challenges to, benchmarking in the U.S. water industry

The water industry benchmark case study was performed with the active participation of the Philadelphia Water Department (PWD) in conjunction with this AWWA Research Foundation (AwwaRF)-sponsored project.

APPROACH
Over 20 utilities actively supported this project with staff time and resources, contributing a wealth of practical knowledge and experience to the project. More than 30 industry representatives participated in early "brainstorming meetings."
A small number of benchmarks, or target levels of performance, were prepared using existing industry databases provided by the American Water Works Association (AWWA) and the National Association of Water Companies (NAWC). These quantitative measures included standards for operating costs and staffing levels. A range of analytical techniques was used, from simple performance ratios to more complex, multivariate regression models.

With the assistance of PWD, a process benchmarking study was undertaken. This focused on the handling of nonemergency leaks and provided valuable insights into the applicability of this method as a means to improve performance in the water industry.

**CONCLUSIONS**

Benchmarking consists of two distinct and separate procedures referred to as "metric benchmarking" and "process benchmarking." They are briefly described below and can be undertaken either as a package or independently:

- Metric benchmarking is a quantitative comparative assessment that enables utilities to track internal performance over time and to compare this performance against that of similar utilities. Areas of relatively good performance, compared to that of other utilities, can be identified, as can those where there is particular room for improvement in performance. In addition, through the comparison process, target levels of performance can be established.

- Process benchmarking involves first identifying specific work procedures to be improved through a step-by-step "process mapping," and then locating external examples of excellence in these process elements for standard setting and possible emulation. This is also known as "Xerox"-style benchmarking after work undertaken by the Xerox Corporation beginning in 1979.

All processes of a water utility are suitable for benchmarking of either type. Current metric benchmarking in the water industry tends to focus on the use of simple performance ratios of inputs to outputs such as cost per mile of main. The diversity of topography, customer demographics, ownership structures, organizational structures, and environmental and financial regulations in the U.S. water industry, invalidates most attempts at comparison of utility performance using simple ratios that do not explicitly account for these "explanatory factors." While ratios may illuminate trends that can be tracked over time, they are poor measures for inter-utility comparisons. Despite this, ratios are extensively used in the U.S. water industry.

Process benchmarking, unlike metric benchmarking, provides a tool by which utilities can change the way they work by introducing improvements in efficiency and service.

Benchmarking is expected to be used more frequently by U.S. water utilities. One reason is the pressure to improve utility performance coming from customers, politicians, and other stakeholders. This pressure is accentuated by increasing occurrence of privatization and contract operations of water utilities.

Both metric and process benchmarking play key roles in improving the performance of water utilities. They should, therefore, be featured as part of routine management practice.