Benchmarking Overview

An Introduction to Various Types of Benchmarking

Summary
This article provides an overview of the benchmarking process, which includes internal benchmarking, external benchmarking, and examples. The benefits of benchmarking are outlined and common pitfalls are identified.

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1. Introduction

Benchmarking is a very broad subject that impacts virtually every area of all businesses. A tremendous amount of literature was written on the subject in recent years, but much of it is not directly relevant to maintenance engineers. This article attempts to provide a concise, relevant overview of benchmarking.

Generally speaking, benchmarking activities are categorized into three types:

- Product Benchmarking
- Strategic Benchmarking
- Process Benchmarking

Product benchmarking involves comparing the functionality and service attributes of competitive products directly against each other. In some cases, manufacturers seek to improve their own product designs or manufacturing methods through a better understanding of what their competitors are doing. This activity is sometimes referred to as reverse engineering. Increasingly, such activities are also undertaken by impartial bodies (such as consumer protection societies and magazines) to provide prospective customers with information on which to base an informed purchasing decision.

Strategic benchmarking is a systematic business process for evaluating alternatives, implementing strategies, and improving performance. Companies understand and adapt successful strategies from external partners who participate in an ongoing strategic alliance [1]. Strategic benchmarking tends to concern itself with the competitiveness and market focus of an organization by comparison with similar bodies. Typically, these studies concern themselves with financial performance and customer satisfaction.

Process benchmarking is the comparison of practices, procedures, and performance with specially selected benchmarking partners [2]. Process benchmarking is the measurement of discrete process performance and functionality against organizations that are excellent in those processes [1]. It is process benchmarking that has the most relevance to maintenance engineers and thus, is considered in the remaining part of this article.

2. Definitions

Benchmarking is the process of consistently researching new ideas, methods, practices, and processes, and adapting, adopting, and implementing their best features. It is the continuous procedure of measuring one's products, services, and practices against the toughest competitors or those companies recognized as industry leaders [3].

In other words, benchmarking is the process of identifying, sharing, and using knowledge and best practices. It focuses on improving any given business process by exploiting top-notch approaches. Finding, studying, and implementing best practices provide the greatest opportunity for gaining a strategic, operational, and financial advantage [1].

Due to the close relationship between benchmarking and the concept of best practice, it is appropriate to include a definition of best practice.

Best practices are those methods, processes, or approaches (internal or external to the company or industry) that represent the best way to accomplish work. Generally, organizations look to the leaders in their field who demonstrate success in specific

areas, and whose methods and output best meet customer requirements [3].
Because benchmarking is a universally applicable tool, it facilitates the identification and transfer of best practice within all business processes. Any business process can be benchmarked [4]. However, over recent years the term "benchmarking" has come to mean different things to different organizations.

To some extent the process hinges on metrics (i.e. statistics based on objective performance measurements that provide a basis for comparing aspects of one organization's performance with those of another). Such comparisons tend to highlight areas of potential improvement and savings, without providing the detail of how to achieve them.

Benchmarking is not the process of measuring best performance. Benchmarking is not about scouring databases and publications for a "best performance benchmark" and employing internal resource and innovation to meet or better it [5]. The objective of benchmarking is to learn how best performance is accomplished.

The fundamental point is that benchmarking is about best practice, rather than best performance.

Compilation and comparison of metrics provides a tool for establishing the desirability of making changes, and monitoring the effectiveness of those changes once they are made. However, published metrics (especially those freely available in the public domain), when viewed in isolation, rarely provide insight into business processes and practices.

Benchmarking is about *establishing* best practice in the fullest sense of the word. It is not simply a process to discover best practice, but also involves a commitment to implement it, and adapt the practice to suit the local situation. Benchmarking is not a quick fix solution but one that requires long-term management commitment.
Benchmarking is not a project to be undertaken by a well-meaning individual. It needs to be done by the organization so the organization can improve. The real role of benchmarking must be seen introspectively to analyze performance and internal processes, and to ensure continuous improvement. Modern management jargon may call this a Total Quality Management (TQM) organization [6].

3. Internal Benchmarking

Benchmarking is also an internal function, which facilitates the transfer of best practice between different parts of the same organization.

The precise definition of "internal" depends upon the organization and the way it views itself. This is especially the case for larger organizations that may have similar facilities operating at different sites or locations.

Internal may refer to benchmarking activities undertaken at an individual location, or comparisons and exchanges of information with other locations (of the parent organization).

Some would argue that internal benchmarking lacks a necessary external perspective, and in consequence does not yield improvements [6]. Improvement goals set on such a basis may not be sufficiently taxing to ensure the organization remains competitive.

However, the experiences of some organizations suggests otherwise. Texas Instruments' quest for best practices started

with external benchmarking. They identified breakthroughs and best practices and attempted to implement them in their various manufacturing facilities. In 1993, Texas Instruments' team of experts traveled from plant to plant to discover that some of their own facilities were actually out-performing the external benchmarks [7].

The American Productivity and Quality Center (APQC) suggests that potential gains from internal benchmarking are enormous [7]:

- Texas Instruments utilized untapped capacity and avoided building a new wafer fabrication plant, which saved $500 million.
- Chevron saved millions by sharing best practices between refineries and other business units.
- Eastman Kodak, through global study of internal best practices in maintenance, implemented improvements that save them approximately $12 million annually. They also improved uptime, quality, and customer satisfaction.

Logic suggests that transfer of best practice across an individual organization should be a tacit feature of normal corporate culture. In reality, there are a number of barriers that inhibit the transfer of best practice between different departments or sites of an organization. These include:

- Corporate management focuses on financial performance, with individual plants allowed a high degree of autonomy to achieve desired financial results.
- The "not invented here" syndrome.
- Sometimes, local management places value on technical expertise and knowledge creation, rather than knowledge sharing. Moreover, they often provide little incentive for the transfer of good ideas from one location to another.
- Lack of real day-to-day contact between individuals performing similar functions at different locations.
- Local staff is often too busy operating the present process and coping with its inadequacies to identify the changes required, adapt them to the situation, and manage the implementation.

Fortunately, this is changing. The barriers previously outlined are eroding as companies become more aware of the concept of "*intellectual capital*" and the value it brings to their enterprise. Principal driving forces are globalization, and the explosive development of Information Technology (IT) [8].

3.1. Example: Internal Benchmarking

One example is the Best Practice Replication Process employed by *Ford Motor Company*. The use of an internally developed intranet-based tool resulted in the establishment of "communities of practice" through provision of the following facilities:

- Collection and dissemination of high value working practice (in the form of best practice documents).
- Building strong relationships between Ford's 360,000 worldwide workers.
- Conversion of metrics (for example time savings) into monetary value.

The Ford example also provides a further illustration of the potential value of internal benchmarking. Over a four year period the company projected a $1.3 billion value, of which $886 million was actually realized. Some specific examples are given in Table 1 [9].

Community / Practice Number	Title	Projected value of practice	No of locations replicating this practice	No of locations NOT replicating this practice
VOPAINT21	Install E-Coat Anode Protection System	$50,035,000	30	9
VOPAINT18	Block Painting per CIM (Batch Painting)	$14,569,900	29	10
VOPAINT26	Optimize Booth Air Consumption for Max TE/Energy Savings	$6,780,200	16	23
VOPAINT23	Implement Total Paint Management including Single Source /CPU/ Managed Service	$5,403,280	30	9
VOPAINT 31	Standardize Sludge water Treatment for Overspray	$5,071,000	15	24

Table 1. Example of Best Practices, Including Projected Value [9].

These developments allow organizations more exposure to overseas competition. Furthermore, knowledge is easily developed and distributed. However, utilization of databases, spreadsheets, emails, and the like does not provide a complete answer. These tools allow easier compilation and distribution of performance metrics, but benchmarking is not about best performance but rather, best practice. Capturing details of the underlying business process usually require detailed, structured discussion between individuals and/or teams. Process mapping, flowcharts, and other techniques are employed to study, compare, and evaluate practices. Unfortunately, much of the information required to transfer a practice cannot be codified. This is known as *tacit knowledge*, the transfer of which usually requires discussion, physical demonstration, and interactive problem solving. The value of such tacit knowledge should not be underestimated [10]. Research carried out by National Semiconductor shows that 80% of the knowledge that needs to be transferred is non-codified [7].

Internal benchmarking is a good way to prepare for an external benchmarking program, as it is necessary to have a detailed understanding of specific business processes [6]. It affords an opportunity to gain experience in the benchmarking process in a more controlled environment, where legal issues and problems such as confidentiality and transfer of proprietary information are simplified.

4. External Benchmarking

External benchmarking involves looking at the experiences and achievements of other organizations to find and adopt innovative improvements. The dividing line between

internal and external depends upon the view that the organization takes of itself, as discussed in the preceding section.

External benchmarking involves seeking outside organizations that are known to be best in class, and provides an opportunity to learn from those organizations. It should be noted that not every best practice solution can be transferred to others, and some may require considerable adaptation to suit the target application.

4.1. Competitive Benchmarking

Competitive benchmarking presents the most challenges as it involves benchmarking against a direct competitor. The obvious problem is the exchange of proprietary information with a competitor. Thus, care needs to be taken to avoid any activity that could be in contravention of competition law. For example, an exchange (between direct competitors) of information regarding costs could, in some circumstances, be construed as an attempt to rig market prices.

Figures available for competitor activity and achievements can be useful, but they may be of limited value in the context of a benchmarking exercise. Some organizations do exchange information in selected areas to achieve best practice, but generally it is impossible to gain a complete understanding of how a direct competitor operates.

Despite these difficulties it is estimated that competitive benchmarking can result in an improvement in productivity of 20% [11].

4.2. Functional Benchmarking

Functional benchmarking involves comparisons with companies in similar industries but not the same market. This is sometimes referred to as industry benchmarking. For example, a supplier of goods or services in one country might benchmark against a similar company active in a different country [12].

Functional benchmarking is typically easier to research, since it is easier to identify potential benchmarking partners. Comparisons are made on a like-for-like basis because companies undertake similar processes in different ways. Innovations that result from such studies are likely to require less adaptation to enable their implementation.

However, functional benchmarking may be expensive, especially if it involves an international dimension. Most renowned companies are overloaded with requests for benchmarking visits and some are starting to charge a fee [12].
It is estimated that functional benchmarking generally results in an improvement in productivity of 35% [11]

4.3. Generic Benchmarking

Generic benchmarking is often referred to as "best practice / world class" benchmarking. It involves comparisons with companies whose main business may be very different, but who carry out the same specific activities (for example, pump maintenance). Functional leaders in specific areas are often easy to identify and confidentiality becomes less of an issue. Sometimes, well established, effective practices in one industry are introduced to another industry, which results in innovative improvements. However, recognizing such opportunities and making them fit into a new environment is often a considerable challenge [6].
There are a number of examples where this cross pollination between industries occurred to good effect. Examples often quoted include:

- Henry Ford's inspiration for assembly line manufacturing came from observing the production methods in a Chicago slaughterhouse [5].
- Xerox adapted warehousing practices from L.L.Bean, a mail order company with a high reputation for prompt and accurate order fulfillment. In consequence, Xerox reduced warehousing costs by 10% [13].

5. The Benefits of Benchmarking

Benchmarking helps create a culture of continuous improvement by:

- setting realistic performance goals and implementing and managing the changes needed to create them.
- enabling processes to become more efficient and effective.
- providing an external perspective. In many cases, performance targets are based on past achievements, rather than the level of attainment required for a company to retain or improve its market position. The external perspective also stimulates an "out-of-the-box-thinking" approach to problem solving.
- generating an understanding of world-class performance [13].

6. Avoiding the Pitfalls.

Benchmarking is an effective tool for creating a climate for change within a continuous improvement program. Unfortunately, statistics show that almost 70% of all process improvement initiatives fail [13]. Thus, management commitment is needed. It must be understood that the activity cannot be rushed.

An average benchmarking study lasts between six and twelve months [14]. Indeed, once started, benchmarking becomes an on-going process [15]. Management must assign a team of people with appropriate levels of knowledge to undertake the study, and authority to implement the resulting changes.

The benchmarking study must be firmly based on clear corporate objectives. Failure to do so results in a study that lacks direction. This often leads to excessive data collection, and process areas outside the knowledge of the assigned team. This lack of focus also extends the time required for completion, which results in a loss of interest from team members and management.

Moreover, if the program doesn't have a clear goal, it is likely to amount to little more than a data gathering exercise.

The benchmarking partner must be chosen with care. The partner should represent best in class for the subject process, and avoid objective conflict. Failure to follow proper protocol and ethics can easily undermine these relationships. A careful balance needs to be struck between an amicable transfer of information and acrimonious theft of proprietary information. Benchmarking is a two-way partnership and the benchmarking team should be willing to share and discuss lessons learned with study partners [14].

An over emphasis on metrics may cause benchmarking goals to be missed. It must be remembered that best-in-class organizations normally demonstrate best performance, but the cause is best **practice** [5]. This is the real key to achieving improvements sought by benchmarking.

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