

# Conforming Benchmarking to Project Management

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**Abstract** Benchmarking is used as an evaluating tool to assess the management skills in project management. Therefore, when benchmarking the work of project managers the underlying variables of the project's organizational structure should be included in the evaluation. Literatures show an increasing interest for the use of benchmarking to improve the project environment. The overall purpose of this paper was focused on suggesting the best ways of adapting project environment to benchmarking techniques. So an organization can better use benchmarking for improving its project management. The paper content falls into 2 categories:

The first part's objective was to show the importance of using benchmarking in project management. Moreover, this part is focused on benchmarking, types of benchmarking, reviewing the project, project management and the relation between them as well. The second part is dedicated to identify metrics for project management processes that can be looked up and used as an aid for potential benchmarkers to define metrics for their own special project management processes.

By benchmarking leading companies many firms have experienced significant success in upgrading their organizational capabilities. As benchmarking can significantly improve the performance of managing companies, similar development can lead in the performance of managing projects.

**Key words** benchmarking, management, project performance, project management

## 1 Introduction

Traditionally, companies with all of their components of business models working together can often achieve long-lasting success.<sup>1</sup>

It is often stated that those who benchmark do not have to reinvent the wheel.<sup>2</sup> by following others one can make improvements and not focus on stale ideas. Benchmarking at first glance may be mistaken for a copycat form of developing strategic plans and for making improvements within an organization. This is not true. Benchmarking is a process that allows organizations to improve upon existing ideas. Benchmarking encourages an external view to ensure the correctness of setting objectives and developing the internal actions necessary to achieve those objectives.

Literatures show an increasing interest for the use of benchmarking to improve the project environment. Project Benchmarking provides precise knowledge of project progress, e.g. in relation to the business case. Its objective is to help an organization achieve 'best-in-class' project management. It is achieving the correct balance that is important so that project personnel are 'doing the right things' and not just 'doing things right'!

Senior management need to know just how good their companies are at delivering projects and even more importantly, at realizing the resultant benefits. In particular they want to know whether, where and how, they can improve, especially in comparison with their competitors. They may well have opinions about his, but few hard facts. Despite this desire to increase the certainty of benefits delivery and greater efficiencies in project costs and timescales, little attention has, so far, been paid to measuring the efficiency of an organization's project management capability.<sup>3</sup>

## 2 Literature Review

### 2.1 Background on benchmarking

Benchmarking can be called the management tool that revived Xerox. Xerox defines benchmarking as the "continuous process measuring our products, services, and practices against our toughest competitors or those companies recognized as leaders."<sup>2</sup> The Xerox of today is not the Xerox of the sixties and seventies. During that time period the organization experienced market erosion from competitors, primarily Japanese. These competitors were marketing higher quality products in the United States at the same price or lower as Xerox. Xerox found that the Japanese were able to assemble quality products at a low price. This was hard for Xerox to grasp because they were the first to develop

the photocopy and their name had come to be synonymous with photocopies. How could the Japanese be beating them at their own game? Xerox found that they had to regroup. In doing this they used reverse engineering and made competitive benchmarking a fundamental part of their operations by the early eighties. Xerox began to study other organizations within and out of their industry.

By 1983, Xerox had benchmarked more than 230 process performance areas in their operation. They looked at all aspects of their business. Identifying the best processes used by others, Xerox adapted them for their own use. This is how they regained their core competency and strategic advantage in the photocopying industry.<sup>4</sup>

Since the first publication on benchmarking in 1989 by Robert C. Camp of "Benchmarking: The search for Industry Best Practices that Lead to Superior Performance", the improvement technique benchmarking has been established as an important tool in the process focused manufacturing or production environment. The use of benchmarking has expanded to other types of industry. Benchmarking has past the doorstep and is now in early trials in the project and construction environment.

## **2.2 What is benchmarking?**

Benchmarking is basically learning from others. It is using the knowledge and the experience of others to improve the organization. It is analyzing the performance and noting the strengths and weaknesses of the organization and assessing what must be done to improve. A vast number of publications exist on benchmarking with no agreed upon definition of the term benchmarking.

Bendell, Boulter and Kelly (1993) write: "Today, quite clearly, the term is ambiguous, woolly, a mystery. It appears to require great subtlety of understanding and clearly means different things to different people."<sup>5</sup>

The absence of a simple definition that is accepted as the real one, leads Carey (1995) to take the key points from a number of definitions and express them stepwise in the following clear terms:

- The methodology of examining in detail something your organization does (the performance measures and practices).
- Then comparing it with a similar process being performed more efficiently and effectively in your own or another organization.
- With the objective of finding ways of making significant improvements to your own process.<sup>6</sup>

Andersen and Pettersen (1996) write: "The process of continuously measuring and comparing one's business processes against comparable processes in leading organizations to obtain information that will help the organization identify and implement improvements."<sup>7</sup>

However, all the above definitions come from production oriented organizations or individuals. This paper is concerned about benchmarking in the project environment, specifically benchmarking of project management. Only two definitions of benchmarking that come from project environments were discovered during this study:

❖A systematic process of measuring one's performance against results from recognized leaders for the purpose of determining best practices that leads to superior performance when adapted and implemented.<sup>8</sup> (CII, 1996)

❖The activity of comparing context, processes, strategies and outputs across firms/projects in order to identify the best practices and to evaluate one's position with respect to them.<sup>9</sup> (IMEC, 1995)

Anyway, benchmarking is not just making changes and improvements for the sake of making a change, benchmarking is about adding value. No organization should make changes to their products, processes, or their organization if the changes do not bring benefits.

## **2.3 Types of Benchmarking**

Literatures shows no consensus on the types of benchmarking, but have instead created several different words to define the various types. Carey (1995) writes." To someone new to the subject it would seem that there are at least 20 variations of Benchmarking, and to make it even more confusing, there are no common definitions when comparing different books or articles."

For the purpose of this dissertation, the types of benchmarking defined by Andersen and Pettersen (1996) will be used. They split the types of benchmarking into two categories, defined by what is compared and whom it is compared against:

A) Compare what?

- Performance benchmarking: comparison of performance measures (often financial, but also operational) for the purpose of determine how good one's own company is compared to others

- Process benchmarking: comparison of methods and practices for performing business processes, for the purpose of learning from the best to improve one's own processes.

- Strategic benchmarking: comparison of the strategic choices and dispositions made by other companies, for the purpose of collecting information to improve one's own strategic planning and positioning.

B) Compare against whom?

- Internal benchmarking: comparison between departments, units, subsidiaries, or countries within the same company or organization.

- Competitive benchmarking: direct comparison of own performance/results against the best real competitors, i.e., that manufacture the same product or deliver the same service.

- Functional benchmarking: comparison of processes or functions against non-competitor companies within the same industry or technological area.

- Generic benchmarking: comparison of own processes against the best processes around, regardless of industry.

Andersen and Pettersen (1996) state that functional and generic benchmarking produce the highest value when combined with process benchmarking. In relation to earlier discussion on benchmarking, process benchmarking seems to be the type of benchmarking that closest meet a general understanding of the concept. In addition, use of benchmarking by e.g. Xerox, focused on performance benchmarking which is necessary to find performance gaps.

However, the focus on project management and its processes requires a fundamental discussion of project and project management.

## **2.4 Definition of project management**

### **2.4.1 Definitions of a project**

It is hard to include all of the differences into one general definition of a project. Therefore, numerous definitions exist ranging from long and complex to short and easy, all depending on its creator and its purpose. By International Standard Organization (ISO 10006, 1996), Project is

"unique process, consisting of a set of coordinated and controlled activities with start and finish dates, undertaken to achieve an objective conforming to specific requirements, including the constraints of time, cost and resources."<sup>10</sup>

The definition that will be used in this paper is from the Project Management Body of Knowledge (PMBOK) by Project Management Institute (PMI, 2000), in which Project is "A temporary endeavor undertaken to create a unique product or service."<sup>11</sup>

The Project Management Body of Knowledge (PMBOK) by PMI is a step forward in standardizing the terminology in project management.

### **2.4.2. Definitions of project management**

Project management is not an exact concept, meaning that there are variations in opinions on what it is. Likewise to project, numerous definitions describe project management. According to the

ISO Quality Management - Guidelines to quality in project management, Project Management includes the planning, organizing, monitoring and controlling of all aspects of the project in a continuous process to achieve its internal and external objectives.

Similarly to the term project, a definition or description of project management that all project involved people agrees on, is hard to make. The efforts in Project Management Body of Knowledge (PMBOK) to create a standardized terminology in project management, is the major reason for selecting it's definition for the use in this paper. The definition from PMBOK is: "Project Management is the application of knowledge, skills, tools, and techniques to project activities in order to meet or exceed stakeholder needs and expectations from a project."<sup>11</sup>

PMI (1996) explains their definition further by stating; Meeting or exceeding stakeholder needs and expectations invariably involves balancing competing demands among:

- Scope, time, cost, and quality.
- Stakeholders with differing needs and expectations.
- Identified requirements (needs) and unidentified requirements (expectations).

## **2.5 Previous researches**

The use of benchmarking technique in various fields has appeared in many academic journals and technical reports. Many studies have been undertaken on the application of benchmarking to customer satisfaction, occupancy rates, capital investment<sup>12</sup>, measuring and improving the performance of tourist destinations<sup>13</sup>, financial savings, and operation improvements<sup>14</sup>.

Since primary principles of benchmarking resulted from Deming's quality management theory<sup>15</sup>, the application of benchmarking has predominantly focused on quality management<sup>15, 16</sup>. Other efforts has recently been paid to examples of the effectiveness of benchmarking, but they have focused on application oriented<sup>17</sup>, promoting profitability of benchmarking<sup>18</sup>, as well as its possible benefits<sup>19</sup>, results oriented<sup>20</sup> and method oriented<sup>21</sup>.

### **3 Benchmarking in Project Management**

Researchers should be aware that more work need to be done to use benchmarking in the project environment to its full potential, yet. In addition, researchers have also discussed other problems. Lema and Price (1995) states four problems that research has to address within the TQM framework in order to find the full potential for benchmarking:

- Identify and prioritize areas with potentials for performance improvement, i.e. what areas should benchmarking focus on?
- Identify sources of best performance and best practices, i.e. who can we compare against?
- Set out a methodology for adapting and improving the best practices in an organization for quality and productivity improvement, i.e. what methodology can we follow to incorporate new knowledge and improve?
- Develop a framework for how to compare performances and set targets in an organization, both within the industry and outside the industry, i.e. internal and external benchmarking.

Swanson (1993) writes: "For most organizations, the decision to benchmark is not hard to make, but the decisions on which practices to benchmark and which performance measures to use are difficult. There is sufficient literature suggesting that benchmarking should focus on critical areas first, but the literature doesn't provide practical tools to help the practitioner select appropriate benchmark subjects and measures."

Sandberg (1996) agrees with Swanson's opinion; "The number 1 problem in benchmarking today is that no one are able to define what one wish to focus on."<sup>22</sup>

Thus, the two most pertinent or prioritized problems these researchers focus on, can with the focus of this paper be summarized as:

- To decide what areas of project management to benchmark.
- To decide what to measure, i.e. define metrics.

#### **3.1 How to choose appropriate areas?**

The identification of appropriate benchmark metrics for project management requires an identification of the objectives of benchmarking; benchmarking has an underlying goal of improvement. Some parameters which will affect the appropriate area which have been chosen are mentioned below:

- Process Maturity: Process maturity defines the quality, rigor or level of performance of an overall process. In effect, it is a measure of the quality and capability of a process.

- Process Effectiveness: Process effectiveness does not evaluate the quality of a process for its own sake, but instead looks at how useful and relevant the process is in supporting the specific types of projects being conducted and the overall culture of an organization. Do the processes make sense? Are they appropriate for the size and type of projects being conducted?

- Project Effectiveness: Project effectiveness explores the extent to which the process outputs meet the needs and expectations of its customers (e.g. accuracy, performance, timeliness and costs)

When working in practice with metrics, there may be metrics that will have an overlap between the categories: process maturity, process effectiveness, and its efficiency.

#### **3.2 How to define metrics?**

Measurements are key. If you cannot measure it, you cannot control it. If you cannot control it, you cannot manage it. If you cannot manage it, you cannot improve it. It is as simple as that (Harrington, 1991).<sup>23</sup>

The word metric is often used for quantitative information or measures employed in a Benchmarking. Qualitative information are usually also needed in Benchmarking.

However, the suggested metrics to each project management process are not meant to be universal metrics for the project management processes. The lists of metrics are meant to be a place for potential benchmarkers to get ideas for their own project management processes. It therefore becomes essential that each organization choose the performance indicators that reflect its own unique strategies and

situations.

Ten common metrics for effective benchmarking in project management are listed below, along with points to consider when evaluating the usefulness and applicability of the metric. As there is no single set of metrics that applies to all organizations, consider these metrics generic.<sup>24</sup>

(1) Project cost:

Organizations must know how much is invested in project management to know if gains attributable to project management are appropriate. This involves tracking a broad range of cost factors including salaries, wages and benefits of project managers and project support personnel; the information technology costs of project management tools; and the amortized value of training, consulting, building rent, travel, etc.

Cost of quality, defines as the amount of money a business loses because its product or service was not delivered correctly in the first place. It includes total labor, materials and overhead costs associated with delivering products or services that fail to meet specifications or customer expectations. Measuring cost efficiency, by means of a Cost Performance Index (CPI), is another useful tool within the project cost metric. According to earned value analysis, which integrates scope, cost and schedule measures to monitor project performance, the CPI is calculated by dividing the earned value of the project by the actual cost. An efficiency metric since it provides a measure of the value a project has generated per dollar spent. The standard deviation of CPI is a useful measure to gauge an organization's ability to estimate costs accurately.

(2) Project Schedule Performance:

Another useful project schedule metric emanating from earned value analysis is the Schedule Performance Index (SPI). SPI is defined as the earned value divided by the planned value delivered by project. As in CPI, the standard deviation of SPI is a useful metric for establishing the organizations ability to schedule accurately. The ability of an organization to estimate costs and schedule accurately enables it to make the most efficient use of its resources, both human and capital.

Gaining greater insight into cost and schedule performance was the objective of a detailed 1994 benchmarking survey authorized by B.C. Hydro, headquartered in Vancouver, British Columbia, Canada. The survey's purpose was to understand the key drivers that account for differences between average and industry-leading performers in the electric utilities industry. The study sought to identify those companies that had found ways to significantly reduce project management costs relative to the other companies surveyed, while maintaining a higher-than-average service level. The study provided numerous insights about project management, which are briefly summarized as follows:

- Increasing the sophistication of project management is a worthy and wise investments, i.e., project spending variances were much Lower when more sophisticated forms of project management were used.
- Project managers in companies with specialized project management organizations handled more projects at the same time.
- Companies were more likely to meet cost targets than schedule targets.
- The engineering function is the least cost and schedule conscious.

Leading performer attributes included establishing a well-defined capital planning process; a strong corporate commitment to the project management concept; allowing a substantial level of project manager control; preparation of a detailed project plan; and flexible and responsive supporting systems for monitoring, controlling and adjusting project parameters through the life of the project.<sup>25</sup>

(3) Return on Investment

Any organization involved in project management must at some point determine what the value of project management is to its operation. Return on investment, defined as "a calculation of the return (additional revenue or projected revenue) that undertaking a project will achieve over a given period of time," is one way of determining this value.

The most appropriate formula for evaluating project investment (and project management investment) is net benefits divided by cost. By multiplying this result by 100, you can determine the percentage return for every dollar you have invested, the key to the effectiveness of this metric is in placing a dollar value on each unit of data that can be collected and used to measure net benefits. This data can include contribution to profit, cost savings, an increase in quality of output converted to a dollar value, etc. Costs could include project design and development costs, cost of resources, cost of travel and expenses, overhead etc.

(4) Staffing

Effective project management requires an adequate staffing of project personnel. People are the most critical project management resource. Project managers oversee project teams and are aided by project support personnel. Organizations need to be certain that they have not only the optimum number of staff but also the appropriate personnel ratios among those responsible for, and involved with, all aspects of project management.

Employee morale is also critical. Organization should explore the turnover rate of its project managers. If it is significant, executives should know why. Measuring morale can be done by using an Employee Satisfaction Index (ESI). An ESI comprises a mix of soft and hard measures that are each assigned a weight based on their importance as a predictor of employee satisfaction levels. The ESI should include the following (percentage represents weight): climate survey results (e.g., pay, growth opportunities, benefits, stress levels, supervisor competence, trust, etc.) (35 percent); focus group results (10 percent); rate of complaints/grievances (10 percent); stress index (20 percent); voluntary turnover rate (15 percent); absenteeism rate (five percent); and the rate of transfer requests (five percent).

Equally important in matters of staffing is which area of the organization has responsibility for resource assignment. An independent approach to resource management, where project staffing is coordinated through a human resources function, just as with organizational Staffing approaches, results in a significant increase in overall project performance and strong recognition and respect for project management within the organization. A standardized definition of roles and responsibilities for those involved in project management should also be established. When roles and responsibilities are clearly defined, there is measurable improvement in overall process performance. Ensuring growth within these roles is important as well. Organizations must regularly measure how project staff develops their own personal knowledge and competence, as well as how frequently and effectively these individuals are encouraged in the areas of creativity, learning and innovation.

#### (5) Productivity

We all want our money's worth, which is why the productivity metric is so important. Productivity defined as "output produced per unit of input". Productivity measures tell you whether you are getting your money's worth from your people and other inputs to your organization.

Researcher suggests that a straightforward way to measure productivity across the board is to use revenue per employee as the key metric. Dividing revenue per employee by the average fully burdened salary per employee yields a ratio, which is the average-per-employee "Productivity Ratio" for the organization as a whole. The key to selecting the right productivity measurements is to ask you whether the output being measured (the top half of the productivity ratio) is of value to your customers or key stakeholders. Researchers suggest that gross profit per employee is, likewise, a "bread and butter" metric.

Why is measuring productivity important? According to a study (conducted by Fred Blanchard and Robert Hassold in 1995), a fiber glass company used standard productivity measures to evaluate its ability to deliver product cheaply and on schedule. Using the original productivity measures as a benchmark, the company introduced an incentive program linked to worker performance on a project. For every 40 hours worked, an employee received shares that could be redeemed at the end of the project if schedule, budget and other critical factors were met. At the end of the test project, the company found that production was two months ahead of schedule, productivity had increased by 2.5% and a portion of the budgeted workforce of 50 on that project was reassigned, allowing for more effective use of personnel. Workers redeemed their shares for cash incentives based on the amount of cost savings achieved.<sup>26</sup>

#### (6) Project cycle time

The project life cycle defines the beginning and the end of a project. Cycle-time measures are based on standard performance, meaning similar projects can be benchmarked to determine a Standard Project Life-Cycle Time. Measuring cycle times can also mean measuring the length of time to complete any of the processes that comprise the project life cycle.

There is a strong correlation between process maturity and the means by which project completion is evaluated. Where project completion criteria are defined, either formally or informally, there is a noticeable improvement in process performance and maturity as compared to organizations that do not define completion criteria.

The Idaho National Engineering and Environmental Laboratory in America developed an expedited environmental management process to address the fact that environmental clean-ups were costing too

much and taking too long. A team analyzed 20 cleanup projects to identify the factors associated with successful clean-ups. The new process that evolved included repeatable, measurable processes based on EPA requirements; and combined systems engineering and project management processes for better control.<sup>27</sup>

#### (7) Post-Project Reviews

Post-project reviews represent a particularly important metric. Project practitioners holding formal reviews of their projects at completion greatly facilitate the process of identifying lessons learned while providing valuable feedback that can be very useful for future projects. We must keep in mind that lack of a clear understanding of the execution of the post-mortem process prevented us from gaining many of the anticipated benefits.

The companies must decide that to fix the problem, it would hold post-mortems after each project phase, collect information related to that specific project phase and involve only those people who contributed to that phase of the project. Through these new processes, the organization felt that it will reduce or eliminate frequently occurring issues and that it would see a renewed interest in participation on project teams.

#### (8) Risk Management

As with just about anything in life, identifying and managing risk makes things go smoother. This is equally true in project management. Risk management is consistently the single greatest indicator of overall project process maturity. Particular areas of focus within an effective risk management metric should include a formal approach to risk identification and assessment, active monitoring of project risk factors throughout the project, and a commitment to conduct periodic risk reviews during the execution of the project. Risks can be classified as either medium or high. It is often helpful in project management planning and implementation to classify tendency risks, in other words, the number of new medium/high risks and the number of risks reducing in severity.

Essilor of America, Inc., a leader in ophthalmic optical products, operated in a competitive and dynamic environment that required acceptance of risk, particularly for market leaders. To identify and evaluate risk in projects, Essilor adopted a Nominal Group Technique (NGT) that relied on the knowledge and experience of the company's diverse range of experts within its workforce of 20,000 employees worldwide. The company developed a software tool to standardize NGT data and capture risk by specific type, whether cost, quality, schedule, etc. The risk was then ranked and qualified for analysis and decision-making by company managers. The project team conducted the initial risk assessment, and management made the final determination regarding the level of risk exposure the organization would accept.<sup>28</sup>

#### (9) Alignment to Strategic Business Goals

Most project management metrics benchmark the efficiency of project management! - Doing projects right. You also need a metric to determine whether or not you are working on the right projects, in other words, are the projects aligned with strategic goals? For an organization to attain portfolio success within its project management function, its projects must be aligned with organizational strategy. This includes an alignment between project spending and corporate strategic goals, as well as the overall corporate level of project delivery against plan, scope and budget.

One way to ensure your projects are strategically aligned with your organization is to conduct an internal survey among project management practitioners, business unit managers and executives. You can use a Likert scale from 1-10 to rate the statement: Projects are aligned with the organizations strategic objectives.

#### (10) Customer Satisfaction

Delivering consistent customer satisfaction enables an organization to command greater loyalty from its customers than can its competitors. It is often the difference between simply doing business and doing business well. Customer satisfaction means that customer expectations have been met and that clients are pleased with the performance of projects.

There is a good way to measure the comfort level of your customers -the Customer Satisfaction Index. Based on a scale of 1-100, this index comprises hard measure of customer buying/use behavior and soft measures of customer opinions or feelings. The index is weighted based on how important each value is in determining overall customer satisfaction and buying/use behavior. This includes repeat and lost customers (30 percent); revenue from existing customers (15 percent); market share (15 percent); customer satisfaction survey results (20 percent); complaints/returns (10 percent) and project-specific surveys (10 percent).

There is one other important point to consider in your quest for customer satisfaction, and that is

customer involvement. Ensuring the involvement of your customers throughout a project not only contributes to project success but also represents a key indicator of process maturity. Today, 48.5 percent of organizations actively demonstrate the involvement of customers throughout the life cycle of a project from initiation through completion.

#### **4 Conclusion**

Benchmarking, by way of a working definition, can best be described as the search for industry best practices that lead to superior performance. Evaluation allows the project manager to look at what was done well, poorly and what can be done better next time. Benchmarking as an evaluating tool provides that.

While benchmarking for project management should be essential in the management practices of any successful business or organization, it is important to remember that establishing useful and meaningful metrics is very much an individual decision. The optimum set of metrics depends on the organizations strategies, technology levels, as well as the particular industry and environment in which it competes. In addition, establishing workable benchmarking metrics should not be a short-term exercise. To get maximum informational benefit, they should be averaged, or indexed, over a large number of similar types of projects over a period of time, perhaps for a minimum of one year.

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