

APPLICATION OF BENCHMARKING PROCESS AS A WAY TO IMPROVE AND INCREASE THE COMPETITIVENESS OF PROJECT PERFORMANCE IN OIL AND GAS COMPANY

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Abstract. as a part of the constant search for continuous improvement process, Well-Replacement division at PT.KUC seek a way to find the best practices that will allow the company to improve results from previous project performance, benchmarking is an important method for this study and widely used to re-examine own process and project performance, it is a business strategy of constantly adjusting and optimizing the internal management. Benchmarking performance management applies to improving project performance, and increasing the competitiveness of one of the most useful management tools. The use of it should allow the Project Manager to identify problems. The key factor in the project performance indicators at current practice with the last 4 years has been benchmarking. It is a strategy for the implementation of the process, as stipulated in the strategic business objectives that are broken down into various "benchmarking indicators" these "benchmarking indicators" assess the results of completed project promote "strategic" implementation. The benchmark indicators linked to each other, complement each other, constitute a common strategy for benchmarking the performance of the index system, so that each member of the organization has a clear performance goal, giving a true unifying force within the organization. Benchmarking is not only a systematic, continuous evaluation process, it is also in the planning and implementation new process allows for a constant flow of business and industry to be made at the highest levels of performance. Benchmarking can improve access to corporate information and performance data to give information for setting goals, and to improve the business processes

Keywords: Benchmarking, Performance Measurement System (PMS)

1. Introduction

Well-Replacement division is one of the divisions in PT.KUC which is responsible to proposed drilling of new replacement wells to substitute the damage wells in order to maintain oil production. PT.KUC itself is oil companies that are located in Riau province or precisely located in PUDU field. PUDU field has been exploited since the 50's and is still in production by PT.KUC. Together with other field, PT.KUC accounts for about 40% of Indonesia's crude oil production. PUDU oil is one of the highest quality in the world. In November 2006, PUDU Oil Field Steam Flood Field reached a record production of 3 billion barrels since it was first explored in 1958. To support this production, there are dozens of contractors companies, ranging from large company to small contractors company.

As the division that responsible for proposing drilling of replacement wells, this division need to ensure that all the replacement project that executed located in the right place in order to get highest oil production, for this research benchmarking method is used, Benchmarking is the procedure of analyzing project activities against how it is performing. It is a very important business practice because it gives comparison between previous project performances with current project performance. Benchmarking can be applied at the unit level of an organization. Performance parameters such as productivity, budgeting and safety are carried out in benchmarking process. For an organization to perform to the optimum, benchmarking strategies are necessary. This paper explores some of the benefits that can be accrued in an oil company as a result of benchmarking.

Internal benchmarking is used in this research. This is benchmarking against operations. It is one of the simplest forms since most companies have similar functions inside their business units. Determining

the internal performance standards of an organization is internal benchmarking's main objective. This enables the sharing of a multitude of information. The benefit of immediate gain comes from identifying the best internal procedures and being able to transfer them to other portions of the organization. Unless it is later used as a baseline for external benchmarking, companies implementing this type can often retain an introverted view (Matters and Evans, 1997).

2. Conceptual framework

Benchmarking is a very structured process that consists of several steps to be taken. These steps are often provided for in a model. It should be noted that even though the process is very structured, it should not add complexity to a simple idea. Basically, "the structure should not get in the way of the process". Most models of benchmarking process include the following steps, according to Bateman (1994) (see Figure 1).

According to *The Nuts and Bolts of Benchmarking*, written by Margaret Matters and Anne Evans (1997), there are five stages included in the benchmarking process which are discussed below:

- (1) Planning the exercise: this step involves identifying the strategic intent of the business or process to be benchmarked. Many times this information can be obtained by looking at the company's mission Statement which summarizes its main purposes. Then selection of the actual processes to be benchmarked must be chosen. This consists of identifying various products produced by the benchmarked company and asking your own company if using this process will create positive results in the organization. Then the customer's expectations must be identified. Finally, the critical success factors have to be determined in order to benchmark. These factors are links to successful business results.

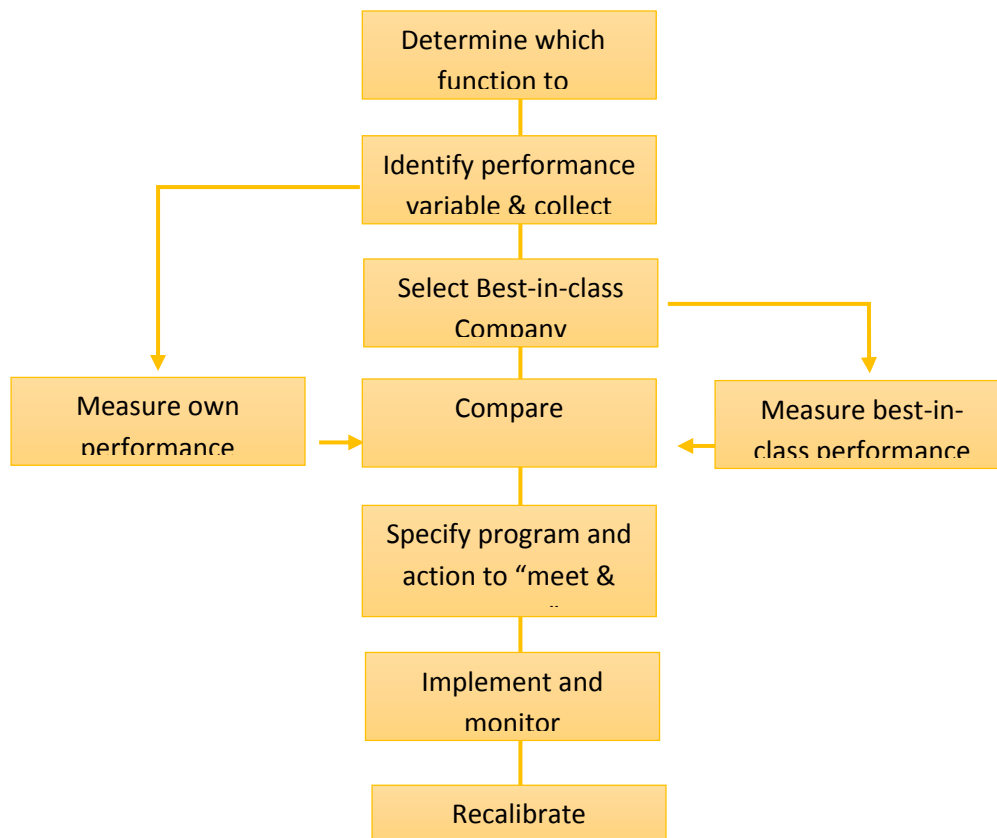


Figure 1 Benchmarking process, adapted from Bateman (1989)

- (2) Form the benchmarking team: the first step is to select overall team members. These members should be chosen from various areas of the organization. All members should cooperate and communicate with one another in order to get the best results out of the benchmarking process. There are three main teams comprising the overall group. The lead team is responsible for maintaining commitment to the process throughout the organization. The preparation team is responsible for carrying out detailed analysis, and the visit team must carry out the benchmarking visit.
- (3) Collect the data: this step involves gathering information on best practice companies and their performances. Before a company identifies best practice companies, they should first identify their own processes, products, and services. This step will allow a company to fully realize the extent of improvements available. Site visits are also an important factor in collecting data because they allow for a more in-depth understanding of the processes.
- (4) Analyze data for gaps: this step involves determining how your company relates to the benchmarked company/department. It allows identification of performance gaps and their possible causes.
- (5) Take action: this step involves determining what needs to be done in order to match the best practice for the process. Not only should determination of changes be made, but they also should be implemented (Matters and Evans, 1997).

Different companies have their own benchmarking methods, but no matter which method is used, the major steps involved are as follows: first, measure the performance of the best-in-class relative to critical performance variables such as cost, productivity, and quality; second, determine how the levels of performance are achieved; and third, use the information to develop and implement a plan for improvement (Omachonu and Ross, 1994).

3. Methodology

This research conducts through a series of study to last 4 years project performance compare to current project performance which has different methodology. Below are key metrics that considered as critical factors that indicated project is success or not.

- Selection criteria benchmarking - focuses its observation and investigation of best practice how is wells are selected as best candidate as replacement
- Production benchmarking - allows comparing the result of oil production
- Cost/Capital expense benchmarking - performing a cost analysis to assess overall competitiveness and productivity.
- Economic benchmarking - is a technique for establishing the arm's length profits of a controlled entity by reference to the profitability of one or more uncontrolled entities determined to be comparable to the controlled entity of interest with respect to functions performed, assets employed, and risks taken.
- Cycle time benchmarking – comparing how fast is one project executed until finished
- Safety benchmarking – comparing how safe project is executed

The benchmarking process involves comparing performance on a set of Measurable parameters of strategic importance against that of firms' known to have achieved best performance on those indicators. Development of benchmarks is an iterative and ongoing process that is likely to involve sharing information with other organizations working with them towards an agreeable metrology.

Benchmarking focuses on the improvement of any given business process by exploiting "best practices" rather than merely measuring the best performance. Best practices are the cause of best performance. Companies studying best practices have the greatest opportunity for gaining a strategic, operational, and financial advantage.

Parameters that will be benchmarked in this research are shown below:

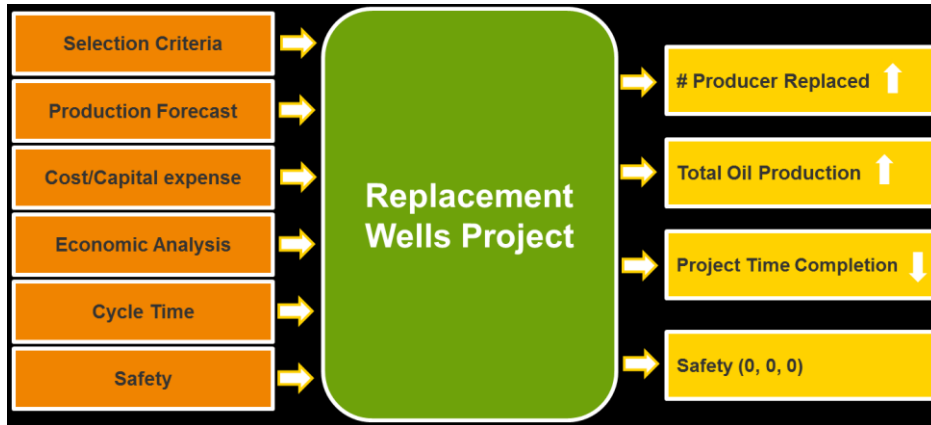


Figure 2: Benchmarking criteria

Sample data: Data collected is from a similar project for 4 years before, there are 111 data sample that used in this research compared to 25 current data (after process improvement) to benchmark each criteria.

Data processing: below is the production data of 111 wells that drilled 4 years before

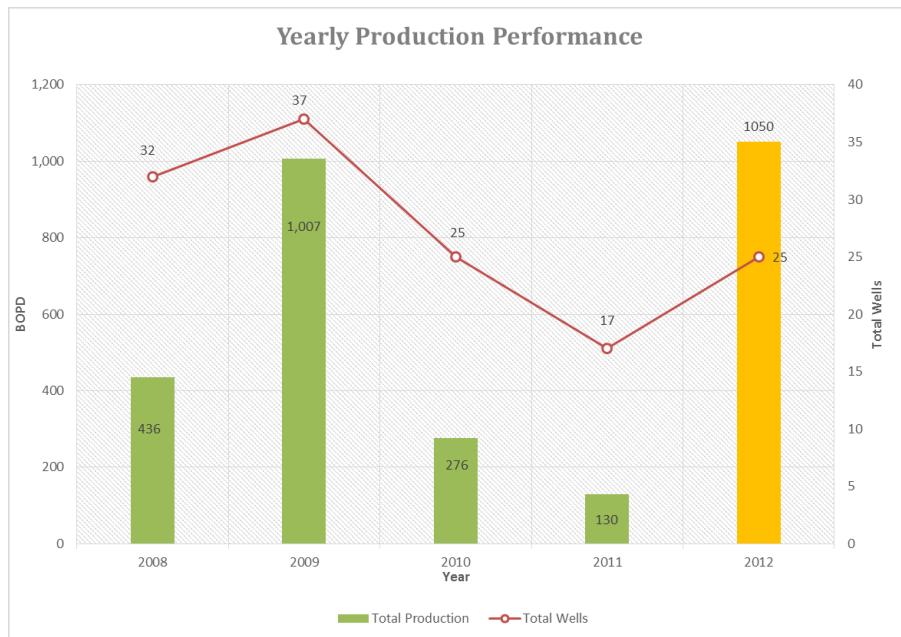


Figure 3 yearly production performance

As shown by the graph above, as one of critical benchmarking criteria the production of the project in 2012, which is after the change of process results significant rises, benchmarking of this process of selection well candidates then then will be best practice for future projects.

The systematic discipline of benchmarking is focused on identifying, studying, analyzing and adapting best practices and implementing the results. To consistently get the most value from the benchmarking process.

4. Research Findings

Benchmarking is usually considered to be a process of seeking out and implementing best practices at best cost. This pursuit of performance is based on collaboration among several organizations or division. The basic principle of benchmarking consists of identifying a point of comparison, called the benchmark, against which everything else can be compared.

A benchmarking dataset with corresponding different project labels is being analysis. All classification methods are selected. Table below shows the completed benchmarking result for corresponding Project.

Benchmarking Criteria	Selection Process	Production result	Cost Expense	Economic	Cycle time	safety
2008 Replacement project	●	●	●	●	●	●
2009 Replacement project	●	●	●	●	●	●
2010 Replacement project	●	●	●	●	●	●
2011 Replacement project	●	●	●	●	●	●
2012 Replacement project	●	●	●	●	●	●

● Good ● Moderate ● Under expectation

Analysis

- Selection criteria benchmarking - focuses its observation and investigation of best practice how is wells are selected as best candidate as replacement

It found that project before year 2012 used a simple flow process for selecting candidate for replacement wells that cause the production for that wells in perform at moderate and under expectation, in order to get good result as shown in 2012 replacement project we should use flow process implemented in 2012 replacement project (robust flow process)

Following diagram show example of improvement process

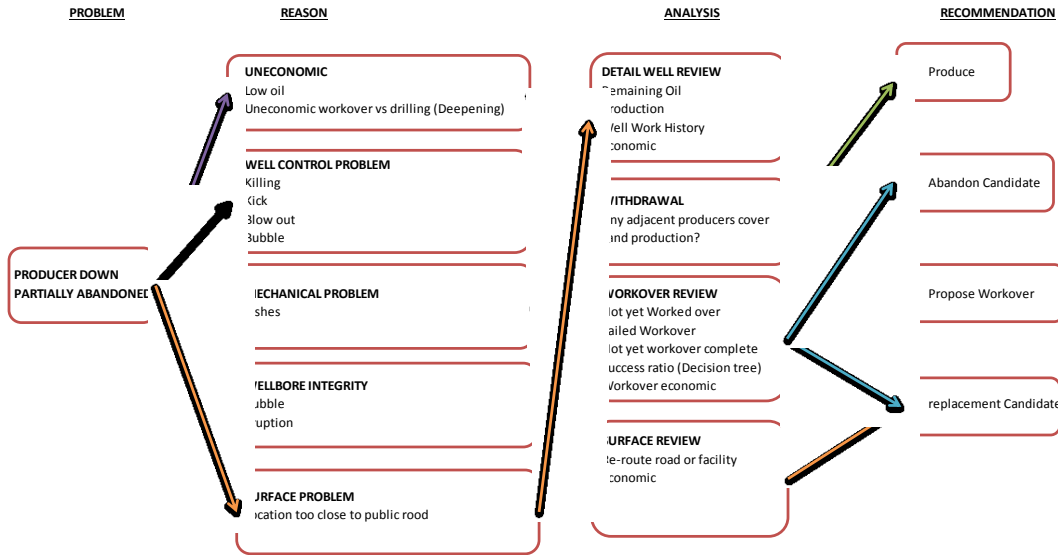


Figure 4 selection criteria flow process

- Production benchmarking - allows comparing the result of oil production. Production related to how we select the wells, 2012 replacement project show the best production performance which is resulted due to robust selection criteria flow process.
- Cost/Capital expense benchmarking - performing a cost analysis to assess overall competitiveness and productivity. Cost/capital expenses for project in this division showing good result since we develop good monitoring tools and good cost forecasting analysis, except for 2011 replacement project there are outstanding cost due to project delay
- Economic benchmarking - is a technique for establishing the arm's length profits of a controlled entity by reference to the profitability of one or more uncontrolled entities determined to be comparable to the controlled entity of interest with respect to functions performed, assets employed, and risks taken.
Economic very related on how good project is producing oil since oil production is most sensitive variable for economic calculation. Economic indicator for this research is presented in following chart

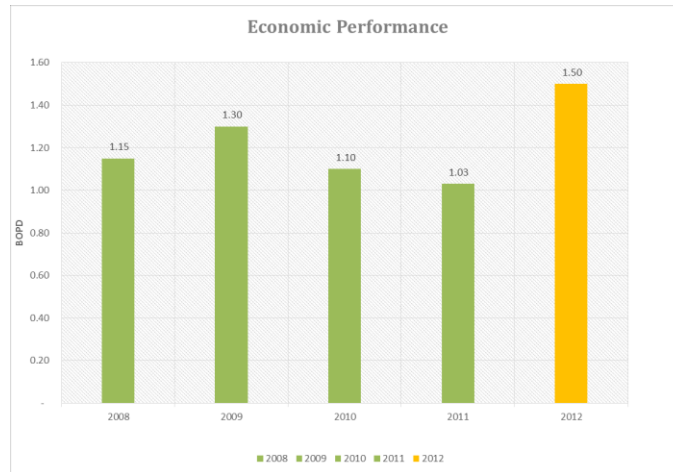


Figure 5 Economic indicator benchmarking

- Cycle time benchmarking – comparing how fast is one project executed until finished
 Before improvement process was conducted, cycle time of each project relatively took long time since we need to prepare document from phase-1, phase-2 and phase 3, but after improvement (starting 2012 replacement project) this phase can be shortened since phase-2 and phase-3 are become 1 phase (eliminate waste). Following Diagram show the improvement process that will be applied to future project without eliminating project quality.

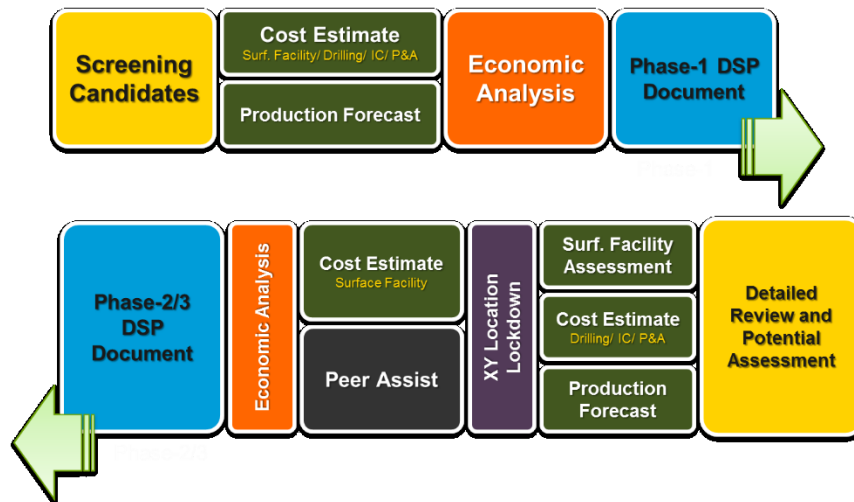


Figure 6 cycle time improvement diagram

- Safety benchmarking – comparing how safe project is executed
 Safety for all project is showing good performance since in this company requires constant attention to countless details and how our work is performed. Safety culture is based on several Tenets of Operation, a code of conduct that employees and contractors use and that supervisors and managers reinforce.

The comparison of this project which adopt benchmarking or not is summarized in following table.

Table 1 benchmarking comparison

Aspect	Without Benchmarking	Without Benchmarking
The creation of effective goal	<ul style="list-style-type: none"> • Lack of information • Reactive • Behind in competition 	<ul style="list-style-type: none"> • Credible, based on customer needs • Proactive • Industry/division leadership
The effort to be competitive	<ul style="list-style-type: none"> • Focus on the internal side • Evolutionary change • Low commitment 	<ul style="list-style-type: none"> • Understand project competitors • Revolutionary ideas with proven performance • High Commitment
Performance measurement	<ul style="list-style-type: none"> • Just do it • Strengths and weaknesses that are not understood 	<ul style="list-style-type: none"> • Resolve the real problem • Results of performance known as the best in its class

Benchmarking process in this division should be adopted if the following circumstances arise (Wibisono, 2006). Those are the processes are critical factors of division; the division performance is uncompetitive, opportunities for process improvement, awareness of the division to the processes which lead to performance, commitment in making changes, and stakeholders' engagement in benchmarking team. Meanwhile, benchmarking process does not need to be adopted if following situations arise, such as division does not have a specific process to be targeted as the critical factor, do not know the performance to be competed with other project, lack of information of consequences for the customer in doing a benchmarking process, does not have sufficient information and calculation for doing benchmarking process, a resistance, and the benchmarking process does not supported by others members. These circumstances are summarized on Table below.

Table 2 Adoption of benchmarking process

Benchmarking should be done if	Benchmarking should not be done
The process which will be benchmarked is the critical factors of the school/faculty.	There is no specific process to be targeted.
The analysis which has been done indicates that the performance of the school/faculty is uncompetitive.	The school/faculty management does not know the performance against to competitors.
There are significant opportunities for process improvement from benchmarks that will be done.	School/faculty does not know what the consequences for the customer on the benchmarking process that will be done.
The people at the school/faculty aware to the processes that occur in the school/faculty and find out exactly the current performance.	The school process uncharted and the calculations of school's performance is unknown and not established yet.
The responsible person for the process to be improved is having a commitment to make a change even if it is a radical change.	There is a very strong organizational resistance against to process changes.
The stakeholders are willing to engage in benchmarking team.	There are only several people who want to do the benchmarking process.

5. Discussion and findings

Focusing on the change process, best project processes do not just arrive, but are results of a change process that eventually leads to best practice, nevertheless There is no single "best practice" because best is not best for every project. Every organization or division is different in some way--different missions, cultures, environments, and technologies. What is meant by "best" are those practices that have been shown to produce superior results; selected by a systematic process; good, or successfully demonstrated in 2012 project. Best practices are then adapted to fit a particular division.

Benchmarking is an efficient tool for collecting data and information related to company performance to improve their own performance and business. Benchmarking has become a popular adopted procedure and is used to gain competitive advantage. Over time the procedures used to benchmark have been improved and modified. Many companies are becoming interested in benchmarking for the continuous improvement it allows. Benchmarking is growing in appeal to organizations due to the cost savings achieved in executing operations. It also supports the organizations' budgeting, strategic planning, and capital planning

Advantages and disadvantages of internal benchmarking are presented in the following table

Table 3 Advantages and disadvantages of internal benchmarking

Type of	Description	Advantages	Disadvantages
INTERNAL	Own organization	<ul style="list-style-type: none"> • Common language/culture/system • Access to data • Communication channels • Low threat • Relatively quick returns 	<ul style="list-style-type: none"> • Inhibit external focus • Foster complacency • Only adequate returns

6. Acknowledgements

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7. References

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