

CHAPTER III



THE BENCHMARKING PROCESS

3.1 Introduction

The members of the design steering committee of the International Benchmarking Clearing House define benchmarking as “ the process of continuously comparing and measuring an organization with business leaders anywhere in the world to order to gain information which will help the organization take action to improve its performance ”.

Camp(1989) defines the benchmarking as “ the continuous process of measuring products, services, and practices against the toughest competitors or those companies recognized as industry leaders ”

Benchmarking is originated by Xerox Corporation in U.S.A. The objective of this approach is to gain the competitive advantage over the Japanese companies in photocopiers.

3.2 Types of Benchmarking

The American Productivity and Quality Center (APQC) (1993) defines the types of benchmarking as follows:

1) Internal Studies

To compare similar operations within different units of an organization. An example of internal studies is the comparison of production planning approaches which use management information system at various manufacturing sites within a multi-unit business.

2) Competitive Studies

Target specific product , processes or method used by an organization's direct competitors. This type of study differs from internal studies in terms of the depth of the study. Competitive benchmarking seeks to establish measures or benchmarks rather than specific information about what enabled the degree of performance of the targeted competitor. An example of competitor studies is the comparison of product distribution method used to service a common distribution channel.

3) Functional or Industry Studies

To compare similar functions within the same broad industry or compare organizational performance with that of industry leader. An example of functional studies is the evaluation of supplier management systems from a sample of companies across industry boundaries.

4) Generic Benchmarking

To compare work processes or practices that are independent of industry. This method is the most innovative and can result in changed paradigms for reengineering specific operations. An example of generic benchmarking is the study of bar-coding applications from a wide variety of industries (checkout stands at grocery stores) as a PC-based inventory control and recording system.

Watson(1992) states that the types of benchmarking as mentioned earlier can be classified, in terms of the goal as follows:

Performance Benchmarking : This type of benchmarking measures the performance of one company's products and processes against those of another companies as the

competitors or industry leader. Examples of the performance benchmarking are the measurement of products, services quality , product features etc.

Process Benchmarking : This type of benchmarking seeks the best practices for conducting a particular business process to improve the key business process

Strategic Benchmarking : This benchmarking focuses on the core competencies that will help sustain competitive advantage; targeting a specific shift in strategy such as developing new products, entering new markets.

3.3 Various Types of Benchmarking Process

Process model for benchmarking vary from company to company. For example, AT&T has a nine-step model , Xerox has a ten-step model , Motorola has a five-step model and Florida Power & Light has a seven-step model. APQC(1993) states that “ the number of steps is not as important as the use of an integrated, systematic, measured approach to benchmarking ”

Xerox's Ten-Step Benchmarking Process Model

- | | |
|-------------------|---|
| Planning Phase | 1. Identify benchmarking subject |
| | 2. Identify benchmarking partners |
| | 3. Determine collection method and collect data |
| Analyzing Phase | 4. Determine current competitive gap |
| | 5. Protected future performance |
| Integration Phase | 6. Communicate findings and gain acceptance |
| | 7. Establish function goals |
| Action Phase | 8. Develop action plans |
| | 9. Implement plans and monitor progress |
| | 10. Recalibrate the benchmark |

Alcoa's Six-Step Benchmarking Process Model

1. Decide what to benchmark
2. Plan the benchmarking project
3. Understand your own performance
4. Study others
5. Learn from the data
6. Use the findings

AT&T's Twelve-Step Benchmarking Process Model

1. Determine who the clients are
2. Advance the clients from the literacy stage to the champion stage
3. Test the environment
4. Determine urgency
5. Determine the scope and type of benchmarking needed
6. Select and prepare the team
7. Overlay the benchmarking process onto the business planning process
8. Develop the benchmarking plan
9. Analyze the data
10. Integrate the recommended actions
11. Take action
12. Continue improvement

Spendolini(1992) states that the benchmarking process consists of five stages as follows:

1. Determining what to benchmark
2. Form a benchmarking team
3. Identify benchmarking partners
4. Collect and analyze benchmarking information
5. Take action

Harrington H.J. and Harrington J.S. (1996) specify the process of benchmarking that consists of 5 phases and 20 steps as follows :

Phase 1 Planning the benchmarking process and characteristics

1. Identify what to benchmark
2. Obtain top management support
3. Develop measurement support
4. Develop data collection plan
5. Review the plans with location experts
6. Characterize the benchmark item

Phase 2 Internal data collection and analysis

7. Collect and analyze internal published information
8. Select potential internal benchmarking site
9. Collect internal original research information
10. Conduct interviews and surveys
11. Form an internal benchmarking committee
12. Conduct internal site visit

Phase 3 External data collection and analysis

13. Collect external published information
14. Collect external original research information

Phase 4 Improvement of the item's performance

15. Identify corrective action
16. Develop an implementation Plan
17. Gain top management approval of the future - state solution
18. Implement the future-state solution and measure its impact

Phase 5 Continuous improvement

19. Maintain the benchmarking data base
20. Implement continuous performance improvement

The American Productivity and Quality Center (APQC,1993) defines the four phases of the benchmarking process models and the five company models as shown below and in Table 3.1 and Table 3.2

Phase 1 Planning a benchmarking project

- Select the process to benchmark
- Gain participation of the process owner
- Select the leader for the benchmarking team and identify the team members
- Identify the process customers' profiles and set of expectations
- Analyze process flow and process performance measures
- Clearly define the process input and output
- Document and flow diagram the process
- Select the critical success factors to benchmark
- Establish data collection method
- Develop the preliminary questionnaires

Phase 2 Collecting data

- Collect internal process data
- Research similar process through secondary sources
- Identify best-in-class and potential benchmarking partners
- Plan data collection
- Develop survey and interview guide
- Contact benchmarking partners and gain participation
- Collect preliminary data
- Make on-site observation

Phase 3 Analyzing data for performance gap and enablers

- Organize and reformat the data to permit identification of performance gaps
- Normalize performance to a common base

- Compare current performance against the benchmark
- Identify performance gaps and their root causes
- Project performance three to five years into the future
- Develop “best practices” case studies
- Isolate process enablers that correlate to process improvements
- Evaluate the nature of the process enablers and best practices to determine their adaptability to your culture

Phase 4 Improving by adapting process enablers and best practices

- Set goal to reduce , meet, and then exceed the performance gap
- Modify process enablers and best practices to meet your company culture and organization structure
- Gain acceptance, support, commitment and ownership for changes required
- Develop action plan
- Communicate the plan to management for endorsement
- Commit the resources required for implementation
- Celebrate the results of the benchmarking project
- Implement the action plan
- Monitor and report progress toward the goal
- Identify opportunities for future benchmarking
- Recalibrate the measure regularly

Table 3.1 The Five Company Models (APQC,1993)

Four - Step Process Model	Plan	Collect	Analyze	Improve
1. Prepare to benchmark	/			
2. Research process		/		
3. Document best practices			/	
4. Report and implement				/
Six – Step Process Model	Plan	Collect	Analyze	Improve
1. Plan	/			
2. Research				
3. Observe				
4. Analyze			/	
5. Adapt				/
6. Improve				/
Seven – Step Process Model	Plan	Collect	Analyze	Improve
1. Determine functional or process to benchmark	/			
2. Identify key performance variable	/			
3. Identify best-in-class-company	/			
4. Measure performance		/		
5. Compare performance and compare gap			/	
6. Specify improvement				/
7. Implement and monitor result				/

Table 3.2 The Five Company Models (continued)

Eight-Step Process Model	Plan	Collect	Analyze	Improve
1. Define business issue	/			
2. Define what to benchmark	/			
3. Define benchmark measure	/			
4. Determine who to benchmark	/			
5. Acquire data		/		
6. Compare performance			/	
7. Identify action to close the gap			/	
8. Implement improvements and monitor results				/
Ten-Step Process Model	Plan	Collect	Analyze	Improve
1. Identify process	/			
2. Identify partner	/			
3. Collect data		/		
4. Determine gap			/	
5. Project future performance			/	
6. Gain support				/
7. Set goals				/
8. Develop plans				/
9. Implement plans				/
10. Recalibrate benchmarks				/

The America Productivity and Quality Center (APQC) addresses the key definition of the benchmarking in the Benchmarking Management Guide (1993) as follows:

Benchmark : “ A best-in-class achievement”.

Benchmarking : The process of continuously comparing and measuring our organization with business leaders anywhere in the world to gain information that will help the organization take action to improve its performance

Critical Success Factors : Those characteristics, conditions or variables that have a direct influence a customer’s satisfaction with a specific business process and therefore on the successive entire business.

Best Practices : Leadership, management, or operational methods or approaches that lead to exceptional performance.

Enablers : Those processes, practices or methods that make possible the best-in-class performance.

Watson (1993) describes the Benchmarking Template as “ a pattern that can be used as a guide for defining a business process”. The template establishes a general context for developing a process model that indicates the specific sequence of actions required to complete the benchmarking process as shown in Fig 3.1

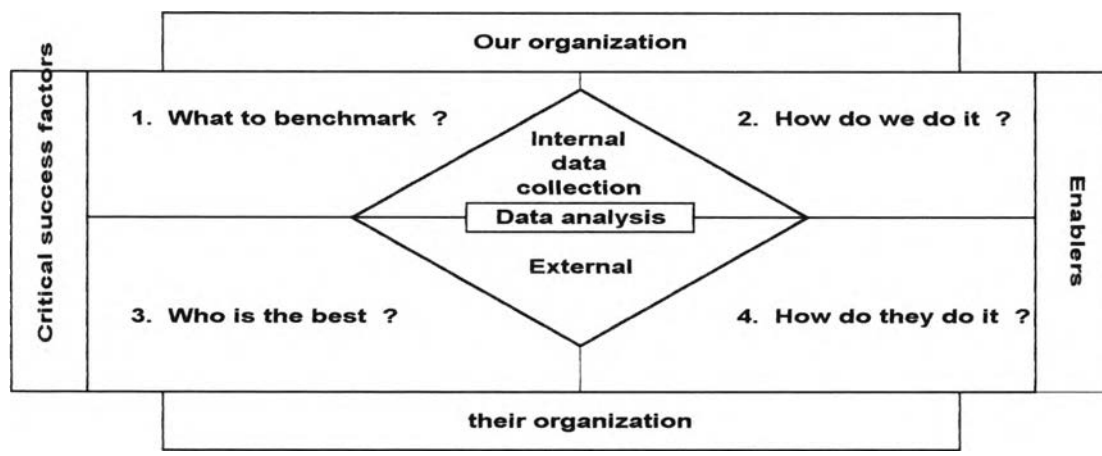


Fig 3.1 Benchmarking Process Template (Watson, 1993)

Watson (1992) defines the benchmarking process model that parallels the plan-do-check-act sequence by using a six- step process as shown below :

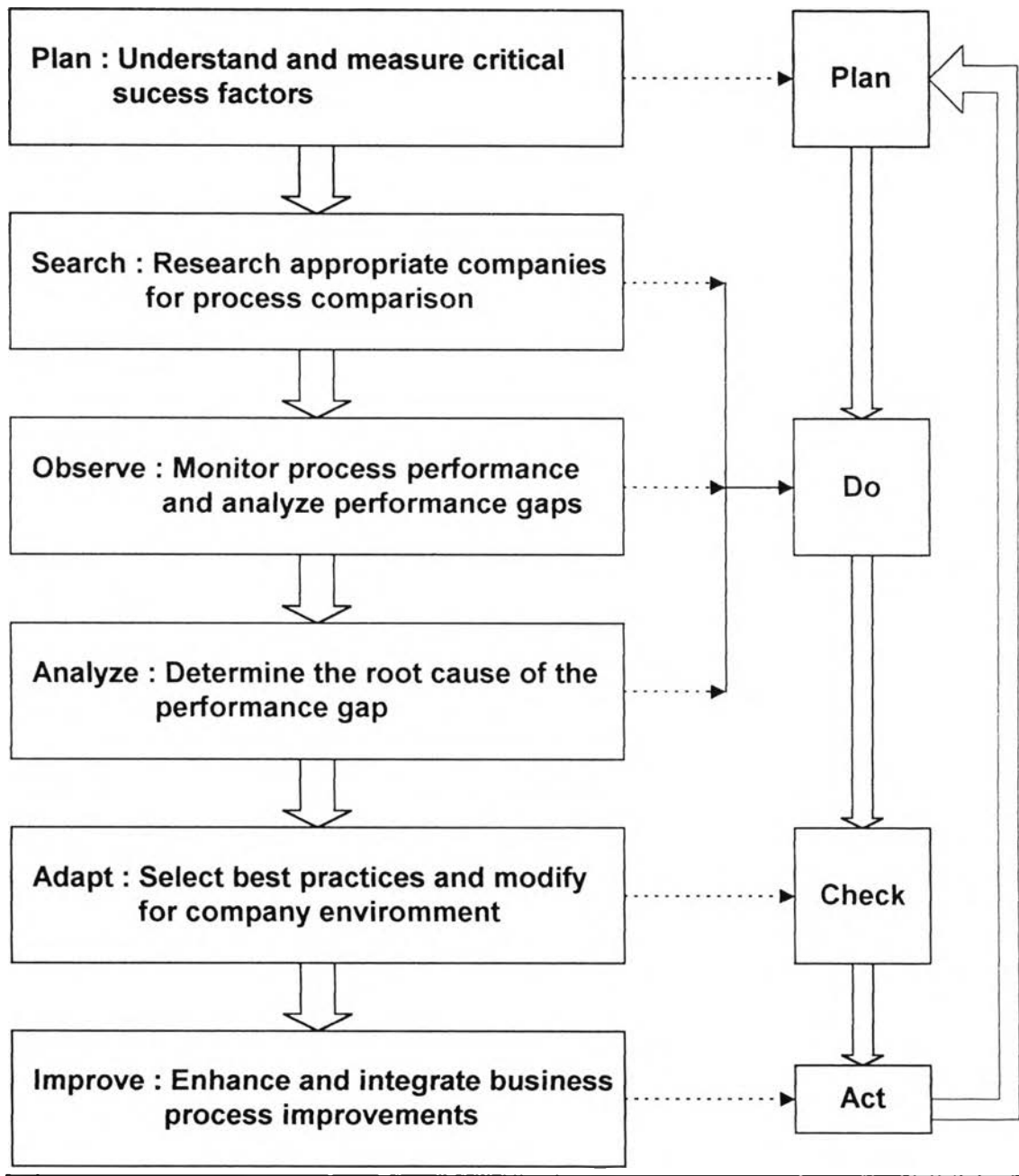


Fig 3.2 Benchmarking Process (Watson,1992)

3.4 The Research Methodology

The current research uses the benchmarking approach as an effective tool for optimizing and improving service operations and its performance. The research study focuses on comparing the air traffic control services operations with the best-in-class in air traffic control (ATC). One of the key considerations for comparing is the service performance levels. The best-in-class organization that needs to be searched is the air traffic services (ATS) organization, Hence, the competitive benchmarking will be addressed because this benchmarking approach compares the company's services against those in the same industry "air traffic control service organizations"

The research study will thus compare the service performance levels against the best-in-class organization in air traffic control operations. The opportunities for performance improvement and the best practices will be searched in order to optimize the services delivery of the company through achieving the customer satisfaction and requirements.

The Competitive Benchmarking

The present research study aims at improving air traffic control services operations that focus on its performance levels. The research study seeks the way to improve service performance and practices to achieve the customer satisfaction and meet those requirements.

The competitive benchmarking is used for comparing Aerothai's service performance against the best-in-class in air traffic control services.

The key considerations for competitive benchmarking used in this research study are as follows:

- Define the current air traffic control service performance levels of Aerothai and how to measure them .
- Define service performance gap and how to closer and widen the gap.
- Define what levels of service performance meet and exceed the customer satisfaction , project performance levels required in the future and how to achieve service performance levels required.
- Define the differences in service performance and key practices that influence on performance levels both Aerothai and the benchmarked company, compare best practices used by the best-in-class company to make air traffic control services successful, how to adopt, modify and change into Aerothai's environment.

The description of the research study can be demonstrated by the chosen types of benchmarking process models. The benchmarking process model used in this research study will focus on 4 phases and 14 steps that are adapted from the five company model as shown in Tables 3.1 and 3.2

The benchmarking process model used can be presented in the benchmarking structure that contains all necessary composite set of phases and steps, combined to achieve the common objective of service performance improvement.

In order to represent clearly the overview of benchmarking process used, the process can be shown in Fig 3.3

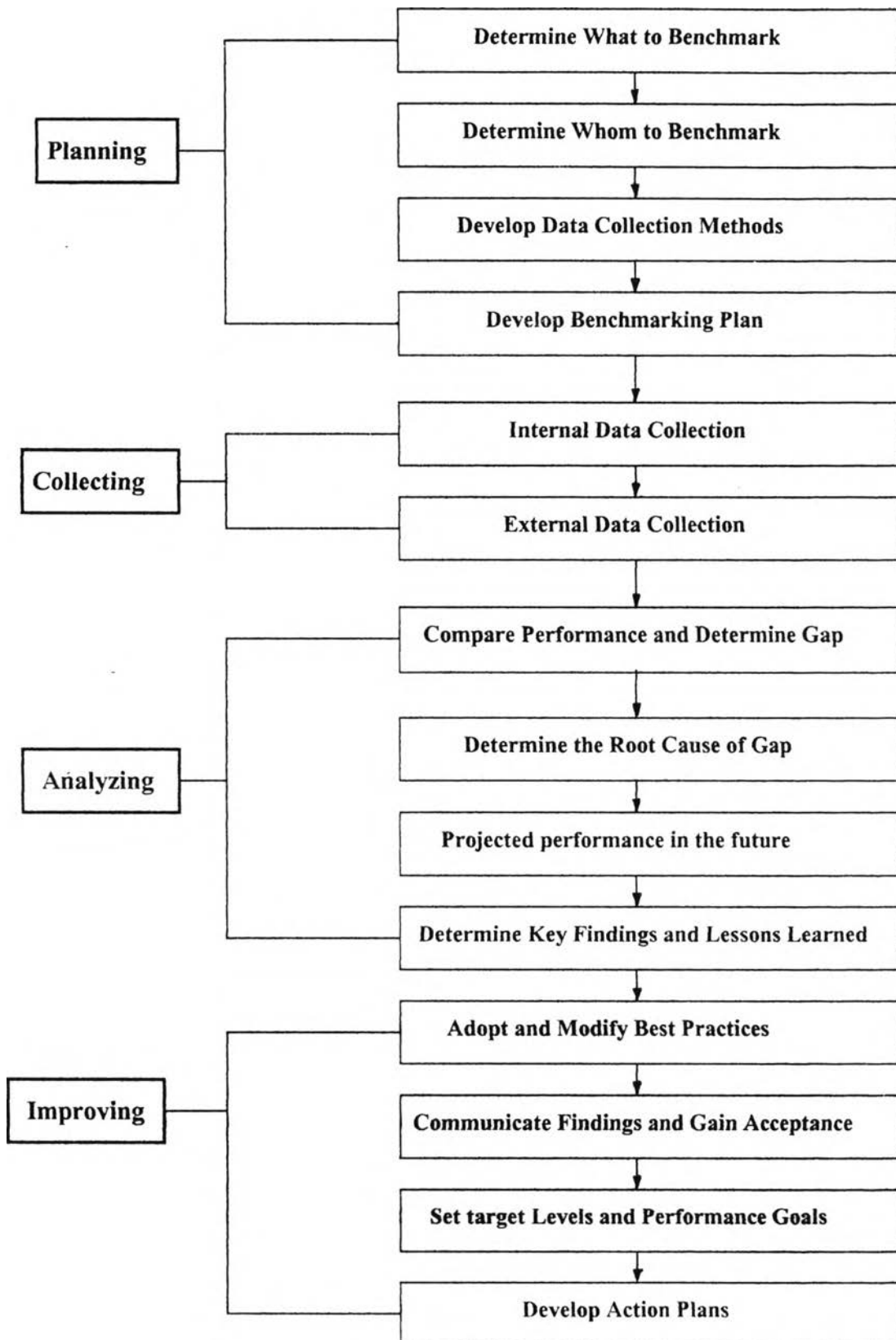


Fig 3.3 Benchmarking Process Model Used
(Adapted from APQC, 1993)

In order to conduct the benchmarking study successfully, the benchmarking study checklists listed below are used to guide the benchmarking study roadmap.

3.5 The Benchmarking Study Checklists

Planning Phase

- What are the Aerothai's services ?
- Who are Aerothai's customers ?
- Who are the world leaders in air traffic control services ?
- What do customers expect from Aerothai's services ?
- How do the services operate ?
- What are the missions and the objectives of air traffic control services ?
- What are the key success factors of air traffic control services ?
- How does Aerothai measure service performance ?
- How does Aerothai compare service performance with the world's best ?

Collecting Phase

- What is the information required ?
- Where are the sources of information ?
- How do we collect the information needed ?
- How do we collect internal information ?
- How do we share the information needed with the world's best ?
- What are the methods used ?

Analyzing Phase

- What is the magnitude of current Aerothai's service performance ?
- What is the magnitude of current benchmarked company's service performance ?
- What is the magnitude of current performance gap ?

- Why the difference in performance gap ?
- How does the world's best do ?
- How does Aerothai do ?
- What is the magnitude of projected performance required in the future ?
- What are the key practices that influence performance change ?
- What are the lessons learned ?

Improving Phase

- How do we adopt the key practices into Aerothai's environment ?
- What is the performance goal ?
- What are the actions that will be taken to achieve that goal ?

The Benchmarking process used as depicted in Fig 3.3 will now be described more fully as follows:

3.6 Planning Phase

3.6.1 Step 1 Determine What to Benchmark

The research study starts with the first step “ What to benchmark” . Some experts in benchmarking give the suggestions for the key considerations as “ What to benchmark ”

Watson(1992) gives the suggestion for selecting “What to benchmark” as “ to plan the benchmarking study, you need to understand your company's business environment. This helps you identify your key business and where you have problems today . It also helps you develop the parameters that define your choice of what processes to benchmark”

Spendolini(1992) suggests that “ developing a benchmarking plan and deciding what to benchmark is the identification of the customer for benchmarking

information”. The need analysis is realized in the planning stage of benchmarking effort.

Leibfried et al. (1992) suggest that “ benchmarking can be done to establish the function or mission of an organization and how that is reflected in its operations and service and benchmarking can also be used to examine existing practices as it look across the organization to identify the practices that support major processes or critical objectives. The benchmarking process begins with a clear understanding of the environment , the competitors and the current structures, processes and the strategies used by the organization”

This research study develops the issues for consideration in selecting the factors to benchmark as follows :

1. Understand view of air traffic control business services, missions and objectives.
2. Analyze air traffic control process and determine the key functional support services operations.
3. Understand customer expectations.
4. Determine the key operational success factors of air traffic control services

3.6.2 Step 2 Determine Whom to Benchmark

In this step, the current research study considers the list of potential companies to be used as the benchmark that must be defined. The selection criteria for a company to be used as the benchmark must be first established.

Selecting the Benchmarked Company

In this step, the list of potential companies to be used as the benchmark must be defined. The selection criteria for companies to be used as the benchmark must first be established.

Ransley (1994) suggests the key considerations for selecting the company to be used as the benchmark as follows:

- Start with literature search to help identify partners.

- Identify other people in the company who have knowledge about best practices company.
- Ask customers, suppliers, consultants, professionals and associations for information about best practices company.
- Limit the numbers of companies to four and eight.

The research study determines the potential companies required to be used as the benchmark in order to search for the one that is superior in both performance and practices and set as the baseline for measuring and improving.

The research study starts with the process of selecting the company to be used as the benchmark as depicted below and shown in Fig 3.4

- 1 List potential companies to be used as the benchmark.
- 2 Develop selection criteria for companies to be used as the benchmark.
- 3 Conduct future research in addition to preliminary research and on hand information.
- 4 Rank the potential companies in each of the selection criteria and identify the one with the highest point.
- 5 Prepare benchmarking questionnaire

1. Identify a list of potential companies to be used as the benchmark.

The first step is to define “Where are the company to be used as the benchmark ?” and “What companies are possible the best-in-class in air traffic control services”. The research study will search the potential organizations that can be used as the candidate list .

2. Develop selection criteria for the company to be used as the benchmark

The potential candidate companies to be used as the benchmark are listed. The selection criteria will be established to identify companies with the most potential. The criteria are concerned with the most critical issues and will play an important role in making the suitable selection. In order to create the criteria to meet the benchmarked company requirements, the carefully established set of selection criteria must be

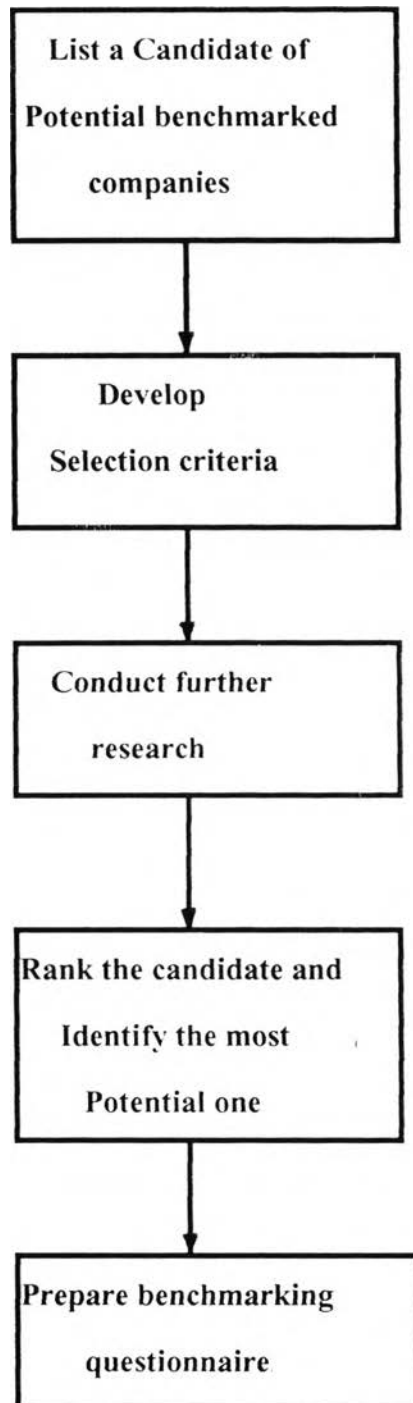


Fig 3.4 The Process of Benchmarked Company Selection

considered and addressed. The available and useful research support and additional information must be acquired.

The research study considers a number of selection criteria as follows:

- 1 Traffic holding/area control center
- 2 Service diversity
- 3 World class innovation and recognition program for aviation communities
- 4 World class and good reputation from aviation communities

3. Conduct further research in addition to preliminary research and on hand information

To ensure that all available information about each company to be used as the benchmark is included and satisfy selection criteria, the additional related information must be searched in addition to on hand information.

4. Rank the potential companies under each selection criteria and identify the one with the most potential

The selection criteria matrix was used as a tool for ranking the potential companies and identifying the companies with the most potential to be used as the benchmark. The appropriate companies will be selected to conform to the results of ranking performed by selection criteria matrix.

5. Prepare benchmarking questionnaire

Once the appropriate companies to be used as the benchmark is identified and accepted, the information sharing with the benchmarked company will be needed. The benchmarking questionnaires will then be developed.

Develop Selection Criteria

-The research study develops the selection criteria for selecting the company to be used as the benchmark.

-The research study develops selection criteria matrix (Tables 3.3 and Table 3.4) in order to rate the candidate companies and find the one with the best score by consulting with the experts in air traffic control both inside and outside of the companies.

-The research study develops four selection criteria. The weighting factors for each selection are specified according to the perceived importance of each criterion. A rating scale with five levels of scores is provided for each criterion : High(5), Medium (3) and Low (1) with 4 and 2 forms scores in-between.

-The research study conducts literature searches from secondary sources and consult with the experts both inside and outside of the company in order to evaluate carefully the potential benchmarked company in order to meet the selection criteria.

-The research study assigns the scores for each potential benchmarked company in each selection criterion by evaluating the potential benchmarked company's information and consulting with the experts in air traffic control both inside and outside of the company.

-The selection criteria matrix, the selection criteria, the weighting factors and selecting the benchmarked company are done by the researcher not the experts. The researcher carefully select the benchmarked company by consulting with the experts both inside and outside of the companies and evaluating the benchmarked company's information from extensive sources of information.

The Selection Criteria

The research study develops four criteria as follows:

Criterion 1 Traffic Holding/Area Control (million flights/year)

The scores are given based on the number of traffic holding controlled by the area control center of each potential benchmarked company.

Criterion 2 Service Diversity

The scores are given based on the diversity of services provided by each potential benchmarked company.

Criterion 3 World class Innovation and Recognition Program for Aviation Communities.

The scores are given based on the outstanding, acceptable and innovation program in air traffic control acknowledged and approved by aviation communities. The world class program enhances and improves safety, capacity and efficiency of the air transportation system as well as copes with challenge of increasing traffic demand. The program gives common benefits to aviation communities in the year 2000.

Criterion 4 World Class and Good Reputation from Aviation Communities.

The scores are given based on the outstanding, reputation and innovation in air traffic control as acknowledged, approved and indicated by aviation communities, association, publications, professionals and airspace users . The criterion focuses on pioneering and innovative operational concept, technology, system as well as quality of service.

The selection criteria are shown in Table 3.3 and Table 3.4

The key consideration for developing selection criteria

To ensure that the research study can meet the potential benchmarked company requirements and select the most potential one, the research study considers and develops carefully the key issues for selecting the criterion. The research study develops four criteria as follows:

Criterion 1 Traffic Holding/ Area Control Center

The research study concentrates on the traffic holding of each ATC organizations that is importance for selecting the benchmarked company. The traffic holding of each ATC organizations demonstrates the capability and responsibility of each ATC organizations in providing services to the customer. The more traffic they control, the more safety they concerned.

Criterion 2 Service Diversity

The research study considers the diversity of ATC services as the key issues for selecting the benchmarked company. The service diversity shows the variety and complexity

of each ATC organizations provided to the customer. The effectiveness of ATC organizations must has service diversity to meet the changing needs of the customer that become more diversity and complexity.

Criterion 3 World Class Innovation and Recognition Program for Aviation Communities

The research study considers this criterion that is very importance for selecting the benchmarked company. This criterion demonstrates the capability of the ATC organizations that create the program for supporting ATC operations and optimizing the benefits to aviation communities.

Criterion 4 World Class and Good Reputation from Aviation Communities

The research study considers the world class and good reputation as the key consideration for selecting the benchmarked company. The world class and good reputation demonstrate the outstanding, performance-based outcome of each ATC organizations that has acknowledged and approved from aviation communities.

The Weighting Factors

The research study allocates the weighting factors for each criterion. The weighting factors for each selection are specified according to the perceived importance of each criterion. The weighting factors can be divided into two factors with the values 0.1 and 0.4 respectively.

The research study considers that **Criterion 3 World Class Innovation and Recognition Program** and **Criterion 4 World Class and Good Reputation** are more importance than **Criterion 1 Traffic Holding/ Area Control Center** and **Criterion 2 Service Diversity**. The research study places the weighting factors for Criterion 3 and Criterion 4 at 0.4 and 0.4 respectively.

The research study considers that **Criterion 1 Traffic Holding/Area Control Center** and **Criterion 2 Service Diversity** are less important than **Criterion 3 World Class Innovation and Recognition Program** and **Criterion 4 World Class and Good Reputation**. The study places the weighting factors for Criterion 1 and Criterion 2 at 0.1 and 0.1 respectively.

Table 3.3 Selection Criteria Matrix

Selection Criteria	Company A	Company B	Company C
1. Traffic Holding/Area Control (million flights/year) (Weighting Factor= 0.1)	5 4 3 2 1	5 4 3 2 1	5 4 3 2 1
2. Service Diversity (Weighting Factor= 0.1)	5 4 3 2 1	5 4 3 2 1	5 4 3 2 1
3. World Class Innovation and Recognition Program for Aviation Communities (Weighting Factor= 0.4)	5 4 3 2 1	5 4 3 2 1	5 4 3 2 1
4. World Class and Good Reputation from Aviation Communities (Weighting Factor= 0.4)	5 4 3 2 1	5 4 3 2 1	5 4 3 2 1

Table 3.4 The Description of Selection Criteria Matrix

Selection Criteria	Measurement		
	High=5	Medium=3	Low=1
1. Traffic Holding/Area Control(million flights/year) (Weighting Factor= 0.1)	More than 50 % of total traffic-based holding	20-30 % of total traffic-based holding	Less than 10 % of total traffic-based holding
2 Service Diversity (Weighting Factor= 0.1)	Over seven	Three or Four	Singular
3 World Class Innovation and Recognition Program for Aviation Communities (Weighting Factor= 0.4)	The program has received extensive acknowledgment and approval from aviation communities for most part of the world	The program has received acknowledgement and approval from aviation communities for some part of the region	There is no world class and recognition program.
4 World Class and Good Reputation from Aviation Communities (Weighting Factor= 0.4)	The company's reputation is extensively acknowledged and approved from aviation communities for most part of the world	The company's reputation is acknowledged and approved from aviation communities for some part of the region	There is no special reputation from aviation communities

3.6.3 Step 3 Develop Data Collection Methods

The benchmarking study relies heavily on information required in all phases of the benchmarking process.

The research study develops various methods for gathering and obtaining various sources of information required. The data collection methods can be facilitated at planning and collecting phase of benchmarking process. The sources of information needed are both primary and secondary sources.

The data collection methods (see Table 3.5) can be classified into the phases of the study and illustrated as follows:

Planning Phase

This phase is concerned with defining and selecting the factors to benchmark including selecting the company to be used as the benchmark.

The data collection methods concerned with planning phase are as follows :

Primary Sources : The research study develops customer surveys for use as an effective tool for gathering the customer perspective on services. To define the customer needs and their expectations from services, the critical success factors of ATC services will be addressed and defined by the customers in this stage of surveys through the benefit of planning phase as

“ What to benchmark”

Table 3.5 Data Collection Methods

Step	Key Activities	Method Used	Sources of Information
What to benchmark	<ul style="list-style-type: none"> - Define customer needs - Define critical success factors (CSF) - Select the factors to benchmark 	Customer surveys	Customer's point of view on services they received
Whom to benchmark	<ul style="list-style-type: none"> - Define list of the potential benchmarked companies - Develop criteria selection - Select the most potential one 	Secondary research	Journals, books, annual report, on-line database, association reports
Internal Data Collection	<ul style="list-style-type: none"> - Measure, gather and document services performance data 	Customer satisfaction surveys	Customer's point of view on Aerothai's services
	<ul style="list-style-type: none"> - Observe, gather and document practices of Aerothai's operations 	<ul style="list-style-type: none"> - Internal assessment by employee surveys - interviews - secondary research 	Aerothai's internal operations of air traffic control
External Data Collection	<ul style="list-style-type: none"> - Measure, gather and document the benchmarked company's services performance data 	-Customer satisfaction surveys	Customer's point of view on the benchmarked company's services
	<ul style="list-style-type: none"> -Observe, gather and document current practices of the benchmarked company's operations 	<ul style="list-style-type: none"> - Benchmarking questionnaire - Secondary research 	The benchmarked company's internal operations of air traffic control

Secondary Sources : For the planning phase, the information on selecting the company to be used as the benchmark for this study can be obtained from secondary sources. The sources of information come from :

- Publication sources
- Annual reports
- Journals
- Books
- Online data base
- Professionals and associations

Collecting Phase

This phase, the research study will gather and obtain performance data from both Aerothai and the benchmarked company in order to compare performance levels. In addition to performance data, collecting such information as internal operations of both companies must be acquired in this phase . The data collection methods concerned with collecting phase are as follows:

Primary Sources

Internal Data Collection : The research study conducts employee surveys as method for assessing Aerothai's internal operations. The current practices, constraints and shortcomings associated with current practices will be defined.

External Data Collection : The research study develops the customer satisfaction surveys in indicating and rating the benchmarked company's performance levels, in terms of satisfaction levels ranked by the customers. The benchmarked company's customer must be Aerothai's customer at the same time.

In addition to collecting performance data, the research study develops the benchmarking questionnaire that are sent directly to the benchmarked company in order to explore the key current practices performed by the best-in-class company.

Secondary Sources : In addition to benchmarking questionnaire, the search for the best-in-class's key practices and enablers are obtained from secondary sources as follows:

- Annual reports
- Publications
- Books
- Journals
- Online data base

3.6.4 Step 4 Develop Benchmarking Plan

The benchmarking plan is developed and set as a guideline document for conducting the benchmarking study. The benchmarking plan contains :

- All phases, steps and activities involved in the benchmarking process
- Demonstrate the allocating schedules requirements for completion of all steps and activities in project milestones dates.

3.7 Collecting Phase

3.7.1 Step 5 Internal Data Collection

Internal data collection is associated with collecting information of Aerothai's air traffic control services operations, which can be divided into two domains as follows :

1. Air traffic control service performance
2. Internal operations of Aerothai's air traffic control services

Domain 1 Air Traffic Control Service Performance

This domain is used for comparing service performance with the benchmarked company in order to determine performance gap that exists between two companies. Aerothai's service performance is obtained from the pilot's who receive Aerothai's services. The customer satisfaction rating is used for determining its service

performance levels ranked by customers. The customer satisfaction surveys can be used as a tool for collecting Aerothai's service performance.

Domain 2 Internal Operations of Aerothai's Air Traffic Control Operations

This domain is concerned with determining current practices, functional support Aerothai's air traffic control operations. For collecting these information, the internal assessment of Aerothai's air traffic control operations will be conducted.

Performance Data Collection

In this step, the data collection concerned with collecting performance data for both Aerothai and the benchmarked company will be conducted.

The research study aims at improving air traffic control performance. The competitive benchmarking will be used for comparing performance data for both Aerothai and the benchmarked company in the same services. Service performance data are qualitative by nature.

1. Service performance data is collected by the customer satisfaction surveys. The service performance rating will be ranked by satisfaction levels from the pilot's point of view who have received services from both Aerothai and the benchmarked company. The high level of satisfaction indicates good performance and low level of satisfaction rating indicates poor performance. Service performance is measured from customer satisfaction in three different aspects.
2. The research study will not collect service performance data as quantitative data because it is difficult to quantify and gather quantitative as performance data from air traffic control operations. Some of the measurements such as human operations performance are difficult to quantify. The research study will therefore apply qualitative survey techniques to gather the customer satisfaction rating ranked by customers' satisfaction levels.

Data Collection Methods

Service performance data can be gathered from customer who receive service. The service performance rating will be indicated and rated by the customer satisfaction rating.

The research study develops customer satisfaction survey questionnaires, which are sent directly to the pilots who use the services from both Aerothai and the benchmarked company. The number of pilots participating in the surveys will rank its satisfaction rating for both Aerothai and the benchmarked company .

In order to meet the service performance data requirements, the key issues that will be considered as follows :

- Survey the pilots who must fly along the flight routes, airspace and its air traffic control system controlled by both Aerothai and the benchmarked company
- The airspace users or pilots have used the services both Aerothai and the benchmarked company up to the survey period.
- Survey the pilots who have captain's rank because of high experiences and fly-hour.

The Customer Satisfaction Surveys (see Appendices D and E)

The customer satisfaction survey questionnaires are used to determine and rate service performance by asking the pilots who receive services

Objectives

The objectives of developing customer satisfaction survey questionnaires are as follows:

- Determine and rate service performance levels measured by the customer satisfaction levels
- Determine the differences in performance for both company

Procedures

- The research study develops the customer satisfaction surveys that are used to determine the service performance
- The survey applies qualitative survey techniques.
- The survey questionnaires contain three benchmarking factors and twenty measures.
- Likert scales within the questionnaires form are used to rate the performance levels. Five performance level rating scale is employed : 5 4 3 2 1

5= Extremely High with the values and 1 = Extremely Low

- For ease of analysis, the research study will assume that the weighting given to all sub-criteria are equally weighted under each criterion.

- Open-ended “comments” are addressed to allow the survey respondents to give specific opinions and additional details on services in specific subjects
- The completed survey questionnaires are collected and analyzed manually
- The survey questionnaires are sent directly to the pilots
- The completed questionnaires are returned in a letters of sealed envelopes.
- The survey respondents are selected to participate in the satisfaction rating measurement.

Internal Assessment of Air Traffic Control Operations

Internal assessment of air traffic control operations is to review and analyze current operations of Aerothai’s air traffic control. The current practices will be reviewed and examined. The shortcomings, constraints, and potential problems will be specified. The opportunities for air traffic control operations improvement will be explored. The internal assessment is based on the key factors in support of Aerothai’s air traffic control operations. The key factors must be defined, reviewed and evaluated in order to contribute to the improvement of the air traffic control operations.

Internal assessment of air traffic control operations will consider three key factors regarded as important to support air traffic control. The key factors will help the company fulfill its missions and objectives of meeting the airspace user requirements.

The Method for Internal Assessment

Primary Research: The research study develops employee surveys as tool for internal assessment of air traffic control operations. Performance questionnaires are sent directly to the air traffic controllers in the area of assessment in which they operate. The responses are to review, analyze and evaluate its current operations in its area. The shortcomings and constraints will be specified.

Secondary Research: The alternative way for gathering Aerothai’s internal operation of ATC services is secondary sources. The sources of information come from :

- Annual reports
- Company reports
- Publication sources

Employee Surveys (see Appendices F and G)

Employee surveys are developed to review and assess current operations of air traffic control services within the environment in which they operate. The surveys contain performance measurement questionnaires that are sent directly to the controllers. The responses obtained from the respondents will help define the problems and analyse operations.

Objectives

The objectives of employee surveys are:

- Determine current operations of air traffic control services.
- Explore shortcomings and constraints of current operations

Procedures

- The survey questionnaires contain four domains of measurement that are the current problems of air traffic control services, human factor operations, air traffic control technology and air traffic control management.
- The survey method applies qualitative survey techniques.
- A Likert scale within the questionnaires is used to indicate the responses. Six levels of responses are employed: strongly agree, agree, neutral, disagree and strongly disagree.
- The completed survey questionnaires are analysed manually.
- The survey questionnaires were sent directly to Aerothai's controllers.

3.7.2 Step 6 External Data Collection

The external data collection is associated with collecting information of the benchmarked company. The collecting data of the benchmarked company's air traffic control operations is similar to collecting data of Aerothai's operations that can be divided into two domains as follows :

Domain 1 Air Traffic Control Services Performance

The collected data on service performance of the benchmarked company are used for comparing service performance with Aerothai in order to determine the performance gap.

The benchmarked company's service performance is obtained from the customer's point of view. The satisfaction rating is used for determining service performance levels ranked by the customers. The benchmarked company's customers are also Aerothai's customers. The customer satisfaction surveys are used as tool for collecting service performance data.

Domain 2 The Internal Operations of the Benchmarking Company's Air Traffic Control

The internal operations of the benchmarking company's ATC services is associated with defining key practices, service enablers, key functional affecting service performance levels. The benchmarking questionnaire is the original research design for determining the operations of the benchmarking company's ATC services. In addition to the benchmarking questionnaire, the secondary research data are utilized.

Data Collection

External data collection is associated with collecting data of the benchmarking company. Service performance data is to measure, gather and document in order to compare its performance levels with Aerothai so that the performance gap can be defined and the opportunities need for performance improvement will be searched. In addition to performance data, the information associated with key practices that influence service performance must be collected and analyzed equally and regarded as important as service performance data.

The method used for external data collection can be listed as follows:

The Customer Satisfaction Surveys (see Appendices D and E)

Like Aerothai, the customer satisfaction surveys are developed to measure service performance levels by customer satisfaction rating. The FAA's customers are Aerothai's customers at the same time.

Benchmarking Questionnaire (see Appendix H)

In addition to compare service performance data with the benchmarking company in order to define performance gap, the analysis of " why is the best-in-class company's performance better than Aerothai's performance, what practices influence higher performance levels, and how Aerothai will achieve it ". The search for best practices that drive higher performance must be conducted.

The research study develops the methods to gather the information from the benchmarked company, in terms of practices, service enablers that influence the superior performance.

The research study prepares and develops the benchmarking questionnaire that is sent directly to the benchmarked company in order to share the best practices information required, determine and explore the original idea and concept as well as superior practices. This will bring about the promotion of Aerothai's service performance improvement through performance change.

The detail description of benchmarking questionnaire can be explained as follows :

1. Determine the key problems of the benchmarked company's air traffic control services and how to solve these problems.
2. Identify the key success of the benchmarked company's air traffic control operations
3. How the benchmarked company improve service performance.
4. Define the benchmarked company's key practices and programs to improve human operations performance, air traffic control technology and air traffic management.

3. 8 Analyzing Phase

This phase is concerned with comparing service performance between Aerothai and the benchmarked company. The performance gap that exists will be addressed. The performance and trend line of its performance will be set. The key practices and service enablers that facilitate and stimulate the desired performance level will be learned and set in specific actions to achieve the service performance improvement.

In the analyzing phase, the research study employs four steps that can be described as follows :

3.8.1 Step 7 Compare Performance and Determine Gap

The service performance data are collected in collecting phase that will be used to compare in this step in order to determine the differences in service performance that exists between Aerothai and the benchmarked company. The gap analysis is used to determine the performance gap. The research study develops the gap analysis tools for determining and defining the differences in performance that can be illustrated as follows :

Table of Performance Comparison

The acquired performance data from Aerothai and the benchmarked company will be listed and indicated in the table of performance comparison in order to define the differences in its performance levels.

Radar Chart or Spider Chart

The radar chart or spider chart is used to indicate the strengths of key measurement of each critical success factor or activity that combine a circle and line graph. The radar chart or spider chart is constructed by dividing the circle into as many “ slices” as there are questions to be plotted.

Z-Chart is used to indicate the trend line of the best-in-class performance levels and Aerothai’s performance level. The differences in performance levels at present indicate the performance gap that exists at vertical axis. Z-Chart plot Aerothai’s performance levels and trend line against the best-in-class’s performance. Z-Chart can be shown in Fig 3.5

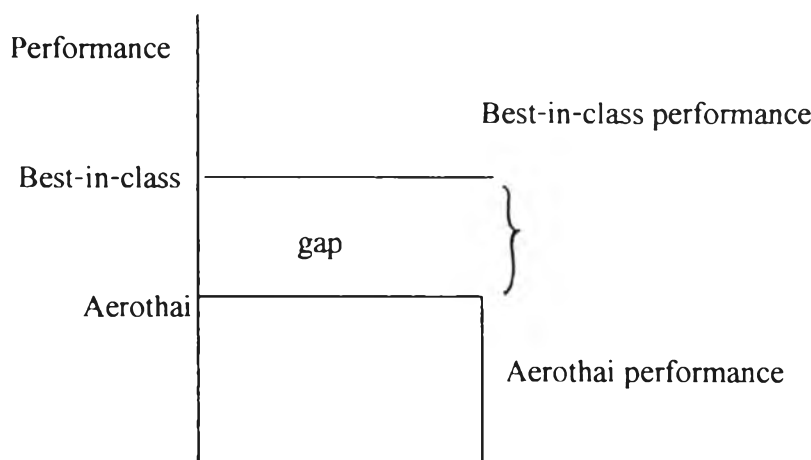


Figure 3.5 Z-chart

Performance Profile Chart

The performance profile chart is used to indicate the differences in performance levels that exists in each measurement of each benchmarking factor in the files.

The Matrix Analysis of Practices

The matrix is used for comparing the key practices perform by both company.

3.8.2 Step 8 Determine the Root Cause of Gap

In order to determine the performance gap that exists between Aerothai and the best-in-class company, the key practices and service enablers that influence performance levels must be defined.

The research study defines and determines the key practices and enablers that facilitate service performance change and define the differences in practices and performance. The root cause analysis is used to define the differences in performance gap as well as the key practices and service enablers that drive the performance change will be defined and addressed.

The key best practices will be analysed in order to isolate, adopt, modify and integrate the practices into a specific action plan that assist Aerothai in improving its service performance levels.

3.8.3 Step 9 Project Performance in the future

In order to gain the competitive advantage in air traffic control services and meet the customer satisfaction, Aerothai must improve its service performance and reduce performance gap. The project performance levels in the future are thus required.

The research study used Z-Chart and competitive performance profile chart as tools for projecting the future performance required.

Z-Chart

Camp (1989) suggests that “ Z - Chart is used to indicate the historical trend information and to project from the historical information estimates of future performance required to achieve the competitive parity ”

It is necessary that Aerothai knows the performance gap that exists with the best-in-class in order to close, reduce and exceed its existing performance gap. The project performance required (as shown in Fig 3.6) must be set and integrated into action plans in order to accomplish its desired performance target. Current performance gap that exists at T_0 will be closed and reduced. The project performance required to meet the parity goal at T_1 will be set in strategic action plans that must be effectively operated from T_0 to T_1 in project timescales in order to enhance performance levels to achieve the parity goal and projected performance required.

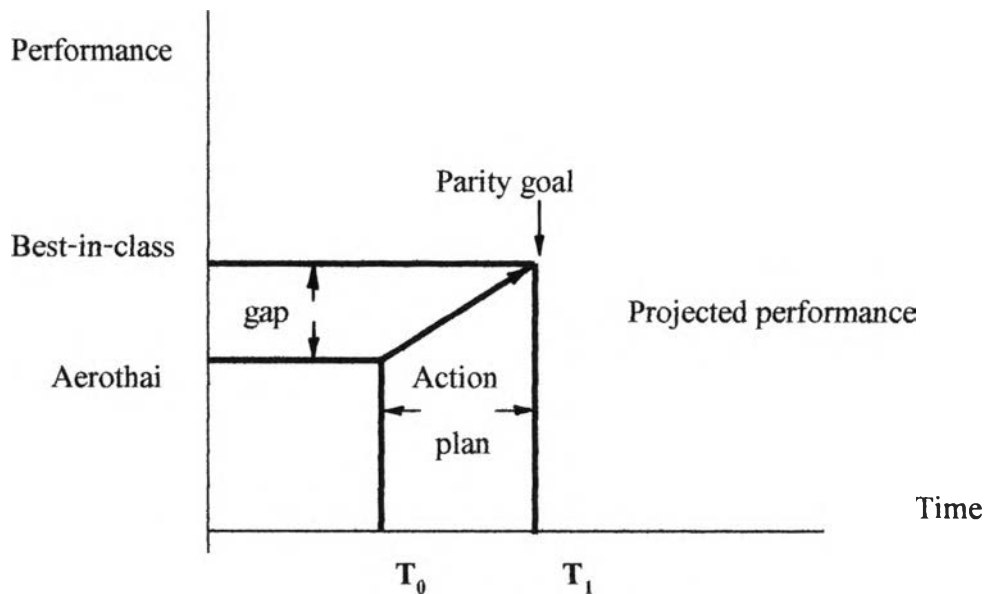


Fig 3.6 Project Performance Required

3.8.4 Step 10 Determine Key Findings and Lessons Learned

In this step, the benchmarking results from the analysis of performance gap and its difference in gap both performance and practices will determine the key findings and lessons learned from the benchmarking study and the question as why the differences in gap, how to close, meet and exceed gap , what we do and what they do. These can be achieved by the key findings and lessons learned.

3.9 Improving Phase

The improving phase is to apply the lessons learned and key findings as well as the knowledge gained from the results of benchmarking study at the analyzing phase for strategic improvement change.

The results of the analyzing phase will explore and identify the key best practices required in adopting, modifying and integrating into strategic actions plan in the improving phase.

3.9.1 Step 11 Adopt and Modify Best Practices

The results of benchmarking study explore the key findings and lessons learned. The best practices found will be determined. The application and adoption of key best practices into Aerothai's environment will be conducted and established as the opportunities for Aerothai's service performance improvement.

3.9.2 Step 12 Communicate Findings and Gain Acceptance

The results of benchmarking study will determine key findings, best practices found that create the need for change, new opportunities for better improvement.

The best practices and planned change must be accepted and approved by top management, service process owners or system operators and the employee involved in the

improvement process. The communication of the findings will be in the form of written report and formal presentation.

In order to ensure that the best practices and new changes can meet the designed outcome, the best practiced must be verified.

Verify Best Practices (see Appendices I and J)

Objectives

- To ensure that new practices and new methods can be a feasible solution and provide a realistic improvement
- To ensure that all best practices are fully communicated to the system operators.
- To allow the system operators to give specific comments on best practices
- To create further modification and adoption of best practices before implementation.

Methods

- Develop verification forms that contain the statement of best practices
- Survey to air traffic controllers as system operators
- 100 personals will verify the statement of best practices by rating and ranking its important of best practices.
- A Likert scale within verification form is used to rate its importance. A five-level rating scale was employed : 5 4 3 2 1

5 = Extremely High with the values and 1 = Extremely low

3.9.3 Step 13 Set Target Levels and Performance Goals

The performance goals are to set as the direction or target levels for performance improvement needed to achieve the customer satisfaction and requirements within specific timescale.

3.9.4 Step 14 Develop Action Plans

The action plans will spell out specific actions to be taken in order to close the performance gap that exists and achieve the performance improvement need.

The research study will develop the action plans that contain a specific area and point to the critical success factors needed to change and improve. The project improvement will be listed in a project estimate of the completion date. Various strategies for achieving the project performance improvement will be addressed.