

CHAPTER IV

DEVELOP BUSINESS UNIT KPI

4.1 General

From the objective of the research to develop and apply performance system into maintenance operation unit, the investigation of implementation of the balanced scorecard concept is observed. Therefore, the implementation of this objective is separated by two major phases, which are corporate strategy formulation and Key Performance Indicators development. The following sections comprehensively describe the detail feedback during the implementation of balanced scorecard concept.

4.2 Corporate Vision and Strategy Clarification

According to the balanced scorecard concept, the goal of this phase is to identify the corporate vision and strategy, which are agreed among company's executive of ABC. Therefore, the corporate vision and strategy are not only to clarify direction of the company, but also are used as the guideline, which every function in the company should be focused in order to effectively translate the corporate strategies into the functional level.

The researcher has set the informal interviewing with the executives of the company. The meeting included two executives. At starting of the meeting, therefore, the researcher briefly introduces the concept of the balanced scorecard and the main objective of the study to the executives. During the meeting, the researcher started the discussion on the corporate vision and strategy by asking, "What is company corporate vision from now till the next five year" and "What are the strategies needed to achieve this vision". The executives stated the corporate vision and strategies clearly. Therefore, some statements, which were unclear with the research, were discussed during the meeting.

Due to the phase of corporate vision and strategy clarification of ABC, the executives set their vision, which focus on becoming the best seller in Thai car industry. Moreover, achievement the customer satisfaction, the company focuses on maintains high quality of product and service. In order to achieve the vision, therefore, the executives have set corporate strategies as follows (see Figure 4-1):

1. Quality of product and service must be excelled with the same market level.
2. In order to complete the competitions with the product cost, the internal business process must be effective.
3. In order to utilize resource effectively, effective management is focused.
4. Strengthening brand image to maintain the reputation to the customer
5. In order to sustain in the competitive market and increase ability of organization, continuously improvement organization is necessary.
6. Gain the maximum profit that is the shareholder expectations.



Figure 4-1: Corporate vision and strategies of ABC.

4.3 Business Unit Pre-Survey

Due to the limitation of time during the study, therefore, the goal of this phase is to make a selection of the most appropriated business unit of ABC, for the implementation of balanced scorecard concept. The most appropriated business unit for the implementation

should be the business unit, which is clarified the most available current data based on the financial, customer, internal business process, and learning/growth perspective.

In order to correct the information, an informal interview was conducted with the manager of management information system function, who is responsible for designing database of every function of the company.

As the result of the interview, the maintenance department is presented the highest for the total score based on the availability of current data (see Table 4-1). Therefore, the maintenance department of ABC is selected for the implementation of balanced scorecard concept during the study.

Department	Perspective				Total Score
	Finance	Customer	Internal Process	Learning /Growth	
Sale	3	2	1	1	7
Paint	2	2	1	1	6
Maintenance	1	3	3	1	8
Engine	2	2	1	1	6
Financial	3	1	1	1	6
Store	2	1	2	1	6
Purchase	1	2	1	1	5
Security	1	2	2	1	6

Note: 3 = adequately, 2 = about right, 1 = inadequately

Table 4-1: Summary of pre-survey of business unit

4.4 Business Unit Strategy Clarification

According to the balanced scorecard concept at the phase of business unit strategy clarification, the goal is to identify the business unit strategy. The effective business unit strategy should be formulated with correlate to the corporate strategies. Therefore, the business unit strategy is not only to clarify direction of the business unit, but also is used as the guideline to develop business unit Key Performance Indicator (KPI), which is used to manage and evaluate the performance of the function.

During the implementation of this stage, the researcher has set informal interview with the management level of maintenance department of the company. The meeting included a managing of director of the company and garage manager who is directly in charge of the maintenance department

As the result of the interview at the stage of business unit strategy clarification of the maintenance department of ABC. The maintenance department has their business unit strategies, which is correlated with the corporate vision and strategies. Therefore, the business unit strategies of the maintenance department are followed: (see Figure 4-2)

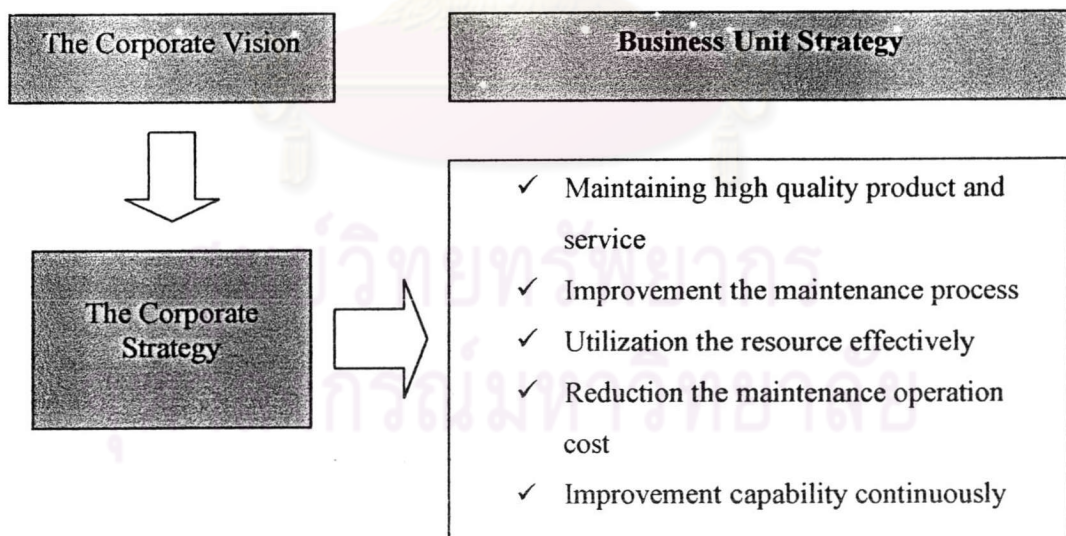


Figure 4-2: Business unit strategies of maintenance department

1. Maintain high quality product and service will maintain high reputation of the company
2. Improvement the maintenance process, which the maintenance department focuses at the reduction the duration and cost of whole maintenance process.
3. In order to utilize the resource effectively, the function focuses on reducing waste during the operation
4. In order to maximize the profit, the cost reduction at Maintenance operation is focused.
5. In order to sustain in the competitive market and increase ability of the maintenance department, continuously improvement capability of the function is necessary.

4.5 Translate Business Unit Strategy

From the literature review, the researcher has studied the concept of the balanced scorecard. Therefore, from the information at the phase of business perspective, the researcher has followed the concept of the balance scorecard by translate the business unit strategies into financial, customer, internal business process, and learning and growth perspectives. Therefore, the business unit scorecard of the maintenance shall be developed at this phase.

In order to clarify the meaning of each critical perspective, however, each critical perspective is discussed as follows:

Financial perspective, the maintenance department of the company identifies financial goal as the company's profit maximization. Therefore, the function focuses on reducing operation cost

Customer perspective, the function focuses on achieving satisfaction of the customer by maintaining high quality of their product and service.

Internal business perspective, the internal measures for the balance scorecard should focus on the business processes that have the greatest impact on customer satisfaction and profit maximize. Therefore, the function considers this perspective on effective internal process, high quality product, and duration of maintenance operation.

Learning and growth perspective, the objectives are intended to drive improvement in financial, customer, and internal process performance for short term and long term. Therefore, in order to maximize their performance effectively, the function focuses on continuous improvement on their personal and technology.

As the result of the translation business unit strategies, the business unit strategy has been translated to the objective of each perspective. (See Figure 4-3)

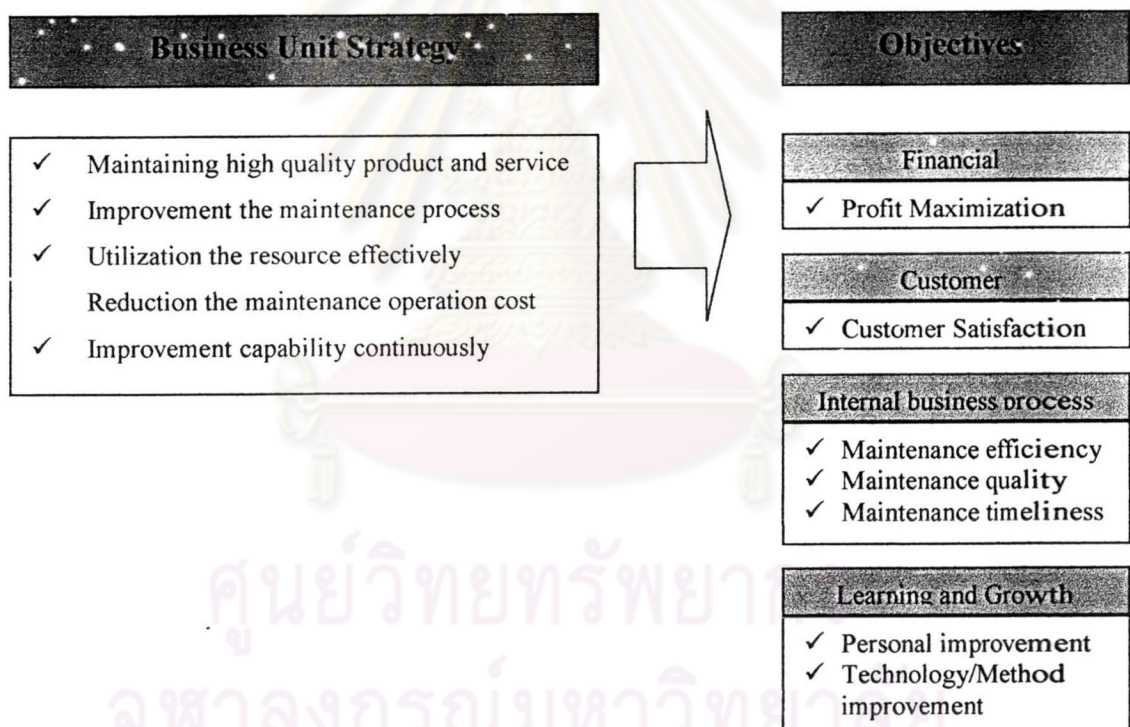


Figure 4-3: Translation business unit strategies

4.6 Develop Business Unit Strategic Map

At this stage, since some business unit objectives had been discussed during the interview with the management of the maintenance department, the business unit strategic map is developed. The researcher used the information on the discussion to develop the business unit objective. Develop business unit strategic map help management to identify relationship in term of cause and effect between each business unit objective.

As the result of develops business unit strategic map, the business unit strategic map is arranging all of the business unit objectives in the area of each perspective. Each business unit objective is identified its relationship with other business unit objective.

The formulation of ABC strategic map shows the relationships between each business unit objective. All objectives have a relation between one or more objectives. In order to achieve that business objective, it is absolutely vital that the company does satisfy objectives other perspectives since all of the four perspectives are strategically interlining one another. This thesis shall focus at Customer perspective because it is, as claimed by the manager, where the problem lied and needed immediate attention. For instance, the researcher determines to solve the Operation time satisfaction as a sample way for further study. Since, it is not possible to solve the entire objective due to time limitation constraint. To solve the problem of operation time satisfaction, it is vital to review on the internal process perspective and further on Growth and learning perspective. With all these review can result in financial satisfaction.

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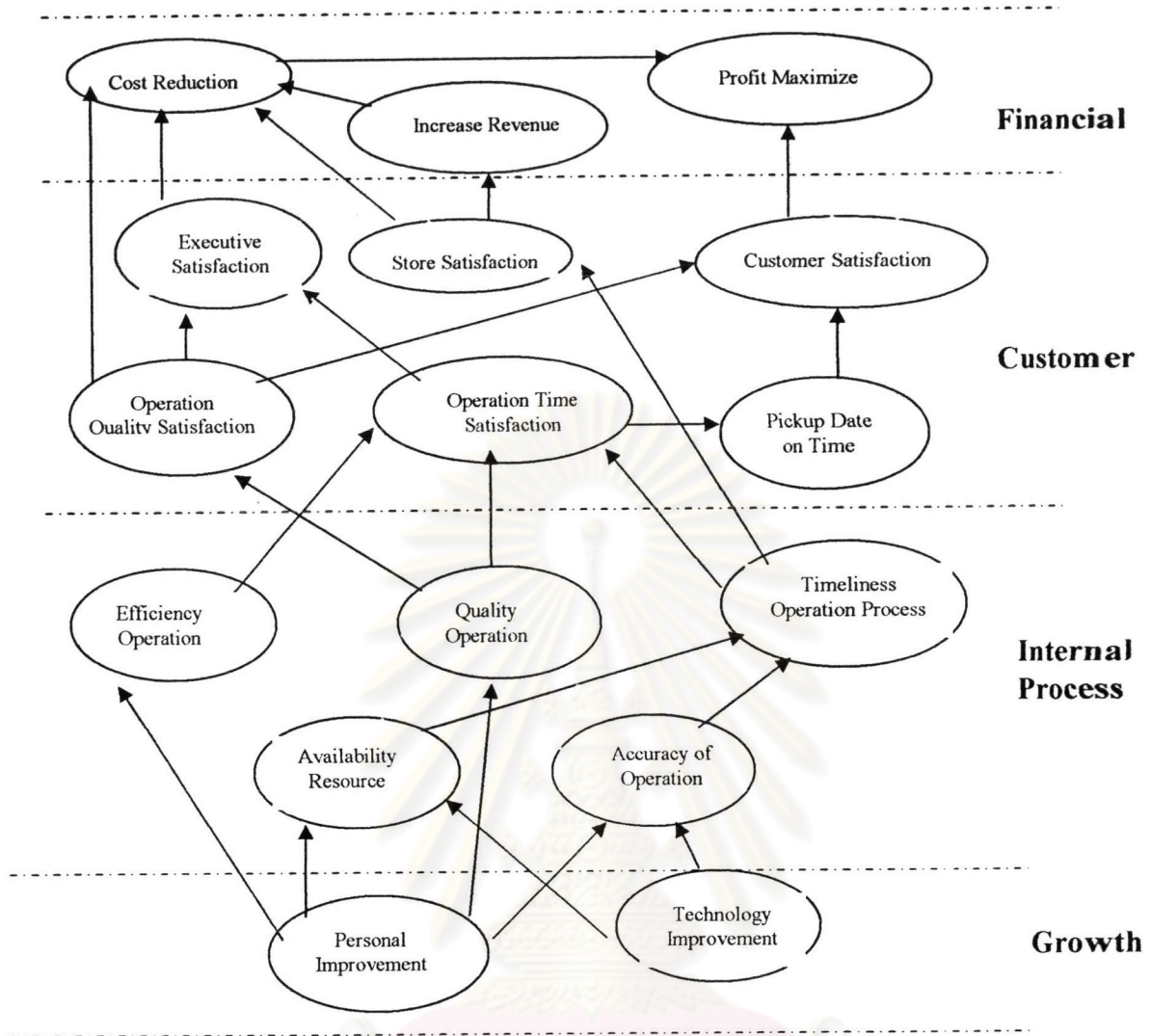


Figure 4-4: Business unit strategic map its relationship

4.7 Develop Business Unit PI

According to the business unit strategic map, the researcher has developed business unit PI of the maintenance unit based on their businesses objectives (see Table 4-2). Therefore, the PIs are used as the guideline for the performance evaluation phase.

<i>Goal</i>	<i>Objective</i>	<i>PIs</i>
<i>Financial Perspective:</i>		
<i>Profit Maximization</i>	Management Cost Reduction	Percentage of management cost from operation cost
<i>Customer Perspective:</i>		
<i>Executive/Customer Satisfaction</i>	Operation Timeliness Satisfaction	Percentage of operation time variance
	Product Quality Satisfaction	Degree of quality on finished job
<i>Store Function Satisfaction</i>	Minimize the storage	Average number of day on storing spare part
<i>Internal Business Process Perspective:</i>		
<i>Efficiency Operation</i>	Waste Reduction	Percentage of value of material lost from used material
<i>Providing Quality Maintenance</i>	Quality Increasing	Average percentage of work quality
<i>Timeliness Of Operation Process</i>	Availability of Resource	Number of job lacking of employee (weekly) Number of job lacking of spare part (weekly) Number of job lacking of equipment (weekly)
	Accuracy of operation time	Number of the job delay (weekly)
<i>Learning/ Growth Perspective:</i>		
<i>Personal Improvement</i>	Employee Skill Improvement	Frequency training of employee (hr/week)
	Employee Satisfaction	Percentage increasing of employee's income
<i>Technology/ Method Improvement</i>	Improvement efficiency of maintenance	Acquiring new technology/method for operation process

Table 4-2: Preliminary business unit PIs

During the implementation at this phase, however, the researcher implemented based on his experience, which is limited in the field of management of maintenance unit and business unit KPI development. The preliminary business unit objectives and PIs might not be practical for the current situation of the maintenance unit of ABC Co, Ltd. Therefore, in order to establish the most appropriate PI for the maintenance unit, the preliminary business unit PI should be validated. Therefore, the implementation process should be done within among of the management of the maintenance unit.

4.8 Business unit PI Validation

The person, who involves in the management of maintenance unit of the company, has been invited for the business unit PI validation. The validation included three evaluators, which are the board of executive director, garage manager, and head of the technician, each evaluator had experience no less than 5 years in this field.

The form of PI validation has been developed in order to select the appropriated indicator for the implementation of the maintenance unit performance evaluation. The PI validation was based on applicability of each PI according to each business objective. The importance of each indicator was ranked. Therefore, the importance scale are ranked from 5 represented most importance to 1 represented less importance. The validation form was sent to each evaluator. Moreover, the sample of the form is attached in Appendix B-1.

As the result of the validation, PI has been reviewed. Some recommendation has made for the revision. Therefore, the recommendations for the revision and the summary of the result of the validation are presented in the Table 4-3. Moreover, the sample and result from the validation is attached in Appendix B-2 and B-3 respectively.

The Result of Validation of Key Performance Indicator of Maintenance Unit at Benz Talingchan Co., Ltd.

Goal	Objective	KPIs
Financial Perspective:		
<i>Profit Maximization</i>	Management Cost Reduction	Percentage of management cost from operation cost Validated
Other Recommended Indicators:		
<i>Profit Maximization</i>	Operation Cost Reduction	Percentage of value material lost from operation cost Validated
Customer Perspective:		
<i>Executive/ Customer Satisfaction</i>	Operation Timeliness Satisfaction	Percentage of operation time variance Validated
<i>Store Function Satisfaction</i>	Product Quality Satisfaction	Degree of quality on finished job Validated
Other Recommended Indicators:		
<i>Executive Satisfaction</i>	Minimize the Storage	Average number of day on storing spare part Validated
<i>Executive Satisfaction</i>	Operation Cost Satisfaction	Percentage of operation cost variance Validated

Table 4-3: Summary results from PI validation

Goal	Objective	KPIs
Internal Business Process Perspective:		
<i>Efficiency Operation</i>	Waste Reduction	Percentage of value of material lost from used material Validated
<i>Providing Quality Maintenance</i>	Quality Increasing	Average percentage of work quality Validated
<i>Timeliness Of Operation Process</i>	Availability of Resource	Number of job lacking of employee (weekly) Validated
		Number of job lacking of spare part (weekly) Validated
		Number of job lacking of equipment (weekly) Validated
	Accuracy of OperationTime	Number of the job delay (weekly) Validated
Learning/ Growth Perspective:		
<i>Personal Improvement</i>	Employee Skill Improvement	Frequency training of employee (hr/week) Validated
	Employee Satisfaction	Percentage increasing of employee's income Validated
<i>Technology/ Method Improvement</i>	Improvement Efficiency of Maintenance	Acquiring new technology/method for operation process Validated

Table 4-3: Summary results from PI validation (Continue)

4.9 Finalize Business Unit Objective

Due to the validation of preliminary business unit objectives the information from the discussion and recommendation are used to modify the preliminary business unit objectives. During the validation, the evaluator has recommended some of the business unit objectives, which is appropriated for the maintenance department. Therefore, the preliminary business unit objectives are revised for the finalization of the business unit objective.

As presented the business unit strategic map of the construction department in Figure 4-4, the explanation of cause and effect relationships of each goals and business unit objective are following.

Financial Perspective:

From the vision of the business unit that to become best car seller and achievement customer satisfaction, the maintenance department also has the goal for the financial perspective that profit maximization of the company must be achieved at the same time (see Table 4-4).

Goal	Objective
Profit Maximization	Construction Cost Reduction
	Management Cost Reduction

Table 4-4: Business unit goal and objective due to financial perspective

Therefore, two factors that would help the business unit create the maximum profit to the company are the reduction of the operation cost and the reduction of the management cost.

Customer Perspective:

At the area of customer perspective, the maintenance department has set their goal in two areas; First goal is to satisfy the business unit, which has work co-relation. And second goal is to satisfy the executives and customer (see Table 4-5)

Goal	Objective
Executive/ Customer Satisfaction	Operation timeliness Satisfaction
	Product Quality Satisfaction
	Operation Cost Satisfaction
Store function Satisfaction	Minimize the storage

Table 4-5: Business unit goal and objective due to customer perspective

The business unit that has work co-relation is store function. Satisfaction achievement of each business unit is based on each of their satisfaction as the minimization of storage time. As satisfaction achievement of each business unit, therefore, the cost of operation and management would be reduced.

Another goal of the customer perspective is to satisfy the executives based on operation timeliness, operation cost, and production quality. Due to achieve the executive satisfaction, the executives would be able to predict and plan for the company effectively, which would maximize the profit to the company.

Internal Business Process Perspective:

In the area of internal business process perspective, the goals of this perspective are recognized with the major factor, which would help the maintenance department achieve the goal of customer and financial perspective. Therefore, the goals of the internal business process perspective are efficiency production, providing quality product, and timeliness of operation process (see Table 4-6).

Goal	Objective
Efficiency Production	Waste Reduction
Providing Quality Product	Product Quality Increasing
Timeliness Operation Process	Availability of Resource
	Accuracy of operation time

Table 4-6: Business unit goal and objective due to internal business process perspective

As the efficiency production, the maintenance department has set objectives of this goal as waste reduction. Achievement of this goal would satisfy the objective of operation timeliness and operation cost satisfaction in the area of customer perspective. Therefore, the objective of operation cost reduction would be satisfied at the same time.

For the goal of providing quality product, the objective of this goal is set as product quality increasing. According to achievement of this goal, the objectives, which are related to the goal of executive satisfaction, would also be satisfied.

The objectives of the timeliness operation process goal are the availability of resource and accuracy of operation time. Therefore, success of this goal would also satisfy the objective of executive and store in the customer perspective.

Learning and Growth Perspective:

In the perspective of learning and growth, there are two major goals as personal improvement and technology and method improvement. Therefore, these two goals are the supportive factor, which would lead the maintenance department to achieve the internal business process perspective (see Table 4-7).

Goal	Objective
Personal Improvement	Employee Skill Improvement
	Employee Satisfaction
Technology/Method Improvement	Improvement efficiency of operation process

Table 4-7: Business unit goal and objective due to learning and growth perspective

The goal of personal improvement is focused at the employee skill improvement and employee satisfaction. Moreover, for the technology and method improvement, the maintenance department focuses at the improvement efficiency of operation process.

4.10 Finalize Business Unit KPI

At this stage, the preliminary business unit PIs of the maintenance department has been reviewed and revised for the finalization of the business unit KPIs. The finalization has been done according to the collected information during the discussion and the implementation of the preliminary business unit PIs validation. During the implementation, the evaluator rated each preliminary PI based on Data availability & accuracy, Timeliness & cost of Data collection, Clarity and validity of KPI, and Comparability of KPI. Therefore, the finalized business units KPIs are selected from the validated PI by rating the score with each of the evaluator. The finalized business unit KPIs is presented in the Table 4-9. Moreover, the information of definition and importance of each business unit KPI is presented in the Table 4-10 to Table 4-17

PIs	Data availability & Accuracy	Timeliness & cost of data collection	Clarity & Validity of KPI	Comparability of KPI	Total
Financial Perspective:					
Percentage of management cost from operation cost	3	3	4	4	14
Percentage of value material lost from operation cost	2	1	3	3	9
Power cost to operation cost ratio	1	1	2	3	7
Depreciation to operation cost ratio	1	1	3	2	7
Customer Perspective:					
Percentage of operation time variance	3	3	4	3	13
Degree of quality on finished job	2	2	3	4	11
Average number of day on storing spare part	4	4	4	3	15
Percentage of operation cost variance	2	2	2	2	8
Internal Business Process Perspective:					
Percentage of value of material lost from used material	3	4	3	4	14
Average percentage of work quality	4	3	4	5	16
Number of job lacking of employee	2	2	3	3	10
Number of job lacking of spare part	2	2	3	3	10
Number of job lacking of equipment	2	2	3	3	10
Number of job delay	4	4	4	5	17
Quality of defect per quantity of operation	1	1	4	2	8
Number of customer complaint per number of job	1	1	4	4	10
Learning/Growth Perspective:					
Frequency training of employee	3	4	3	3	13
Percentage increasing of employee's income	4	4	3	3	14
Acquiring new technology/method for operation process	1	1	2	2	6

Table 4-8: Selection of KPIs

Goal	Objective	KPIs
Financial Perspectives:		
Profit Maximization	Management Cost Reduction	Percentage of management cost from operation cost
Customer Perspectives:		
Executive/Customer Satisfaction	Operation Cost Satisfaction	Percentage of operation cost variance
Store Function Satisfaction	Minimize the storage	Average number of day on storing spare part
Internal Business Process Perspective:		
Efficiency Operation	Waste Reduction	Percentage of value of material lost from used material
Providing Quality Maintenance	Quality Increasing	Average percentage of work quality
Timeliness of Operation Process	Accuracy of operation time	Number of the job delay (daily)
Learning/Growth Perspective:		
Personal Improvement	Employee Skill Improvement	Frequency training of employee
	Employee Satisfaction	Percentage increasing of employee's income

Table 4-9: Finalize Business unit KPIs

Name of KPI	Percentage of management cost from operation cost
Definition of KPI	The management cost compares with the total operation cost, expressed as a percentage of the total operation cost
Objective of KPI	To evaluate the management efficiency during the operation
Formula of KPI	$\frac{\text{Total management cost}}{\text{Total operation cost}} * 100$
Name of KPI Owner	Financial
Update Frequency	monthly
Availability of Data	No Current Data Source Executive management
Data Sources	Accounting department
Periodicity of KPI Presentation	Semi- annually
Unit of Measure	%

Table 4-10: Template for F-1

Name of KPI	Percentage of operation cost variance
Definition of KPI	Variance between the actual operation cost and the estimating operation cost, expressed as a percentage of the estimated operation cost
Objective of KPI	To evaluate the performance efficiency of the maintenance unit due to the cost control
Formula of KPI	$\frac{\text{Actual operation cost} - \text{Estimated operation cost}}{\text{Estimated operation cost}} * 100$
Name of KPI Owner	Technician
Update Frequency	monthly
Availability of Data	No Current Data Source Executive management
Data Sources	Accounting department and Maintenance department
Periodicity of KPI Presentation	Semi- annually
Unit of Measure	%

Table 4-11: Template for C-1

Name of KPI	Average number of day on storing material
Definition of KPI	The number of day, which the store department store operation resource before use
Objective of KPI	To evaluate the performance efficiency of the maintenance unit due to the resources scheduling
Formula of KPI	$\frac{\Sigma (\text{Date of using material} - \text{Receive date of material delivery})}{\text{Number of material deliver}}$
Name of KPI Owner	Warehouse manager
Update Frequency	weekly
Availability of Data	Yes
Data Sources	Store department and Maintenance department
Periodicity of KPI Presentation	monthly
Unit of Measure	days

Table 4-12: Template for C-2

Name of KPI	Percentage of value of material lost from used material
Definition of KPI	The value material, which is lose during operation, compares with the total value of usage material, expressed as a percentage of the total value of material usage
Objective of KPI	To evaluate the performance efficiency of the maintenance unit due to material lost control
Formula of KPI	$\frac{\text{Total value of material lose} * 100}{\text{Total value of material usage}}$
Name of KPI Owner	Technician
Update Frequency	weekly
Availability of Data	No Current Data Source Executive management
Data Sources	Maintenance department
Periodicity of KPI Presentation	monthly
Unit of Measure	%

Table 4-13: Template for I-1

Name of KPI	Average percentage of work quality
Definition of KPI	The quality of operation work, expressed as a percentage
Objective of KPI	To evaluate the performance efficiency of the maintenance unit due to production quality
Formula of KPI	Company Record
Name of KPI Owner	Technician
Update Frequency	weekly
Availability of Data	Yes
Data Sources	Maintenance department
Periodicity of KPI Presentation	monthly
Unit of Measure	%

Table 4-14: Template for I-2

Name of KPI	Number of work delay
Definition of KPI	The number of operation work, which is delay from the estimated working duration
Objective of KPI	To evaluate the performance efficiency of the maintenance unit due to schedule control
Formula of KPI	Company Record
Name of KPI Owner	Technician
Update Frequency	weekly
Availability of Data	Yes
Data Sources	Maintenance department
Periodicity of KPI Presentation	monthly
Unit of Measure	jobs

Table 4-15: Template for I-3

Name of KPI	Frequency training of worker
Definition of KPI	The providing of employee training based on their scope of work
Objective of KPI	To evaluate the performance efficiency of the training department due to the effective contribution of employee training
Formula of KPI	Company Record
Name of KPI Owner	Executive
Update Frequency	Semi-annually
Availability of Data	Yes
Data Sources	Training department
Periodicity of KPI Presentation	Yearly
Unit of Measure	times

Table 4-16: Template for L-1

Name of KPI	Percentage increasing of employee's income
Definition of KPI	The increasing of employee's income, expressed as a percentage
Objective of KPI	To evaluate the performance efficiency of the employee
Formula of KPI	$\frac{\text{The company expenditure of labor}}{\text{Total number of labor}}$
Name of KPI Owner	Financial
Update Frequency	Yearly
Availability of Data	Yes
Data Sources	Accounting department
Periodicity of KPI Presentation	Yearly
Unit of Measure	%

Table 4-17: Template for L-2

4.11 Evaluation

Due to the stage of business unit KPI validation, the business unit KPIs of the maintenance department of ABC has been successfully reviewed and revised. Moreover, the evaluator have recommended some of the effective business objectives and KPIs with the clearly explanation. The business unit KPIs, which have been finalized with the involvement of management as those five evaluators, would be effective for the performance measurement of the maintenance department at this moment. However, the number of evaluator and the degree of commitment during the validation of each evaluator might affect the practicality of the business unit KPIs. According to effectively performance measurement, the business unit KPI should be re-validated according to the changing of period of time. Moreover, as the objective of the study, the business unit KPIs is used as the guideline for the performance measurement at the stage of KPI Implementation.