

# CHAPTER II

## THEORETICAL ASPECTS AND LITERATURE REVIEWS

This chapter summarises theoretical aspects related to this research study and presents literatures about the development of Key Quality Indicators with the purpose of customer satisfaction improvement.

### 2.1 Definition of Strategy

A few of the alternative views of strategy terminology is quoted below.

Schermerhorn (2002) defines a strategy as:

“a comprehensive action plan, which identifies long-term direction for an organisation and guide resource allocation to accomplish goals with sustainable competitive advantage.”

Quinn (1988) defines strategy as:

“the pattern or plan that integrates an organisations major goals, policies and action sequences into a cohesive whole. A well formulated strategy helps to marshal and allocate an organisation resources onto a unique and viable posture based on its relative internal competencies and shortcomings, anticipated changes in the environment and contingent moves by intelligent opponents.”

Drucker (1974) says the prime task of strategic management is thinking through the mission of a business:

“That is, of asking the questions ‘What is our business – and what should it be?’ This leads to the setting of objectives, the development of strategies and plans, and the making of today’s decisions for tomorrow’s results. This clearly must be done only by a part of the organisation that can see the entire business; that can make decisions

that affect the entire business; that can balance objectives and the needs of today against the needs of tomorrow; and that can allocate resources of men and money to key results.”

Pearce II (1991) defines the strategic management as the set of decisions and actions that result in the formulation and implementation of plans designed to achieve a company’s objectives. It comprises nine critical tasks:

- “1. Formulate the company’s mission, including broad statements about its purpose, philosophy, and goals.
2. Develop a company profile that reflects its internal conditions and capabilities.
3. Assess the company’s external environment, including both the competitive and general contextual factors.
4. Analyse the company’s options by matching its resources with the external environment.
5. Identify the most desirable options by evaluating each option in light of the company’s mission.
6. Select a set of long-term objectives and grand strategies that will achieve the most desirable options.
7. Develop annual objectives and short-term strategies that are compatible with the selected set of long-term objectives and grand strategies.
8. Implement the strategic choices by means of budgeted resource allocations in which the matching of tasks, people, structures, technologies, and reward systems is emphasised.
9. Evaluate the success of the strategic process as an input for future decision making.”

David (1986) describes the strategic management process as:

“... as an objective, systematic approach for making major decisions in an organisation. Strategic management is not a pure science that lends itself to a nice, neat, one-two-three-type approach. Rather, strategic management is an attempt to

organise qualitative and quantitative information in a way that allows effective decisions to be made under conditions of uncertainty.”

Gleuck (1980) defines strategic management as:

“... that set of decisions and actions which leads to the development of an effective strategy or strategies to help achieve corporate objectives.”

Finally, Johnson and Scholes (1984) states that strategic decisions are concerned with:

The scope of an organisation’s activities

The matching of an organisation’s activities to its environment

The matching of the activities of an organisation to its resource capability

The allocation and re-allocation of major resources in an organisation

The values, expectations and goals influencing strategy

The direction, an organisation will move in the long term

The implications for change throughout the organisation.

Generally, strategy is defined as a comprehensive plan of action that set a critical direction and guides the location of resources to achieve long-term organisational objectives. It is an action focus that represents a “best guess” regarding what must be done to ensure continuing prosperity for the organisation.

## **2.2 Level of Strategy**

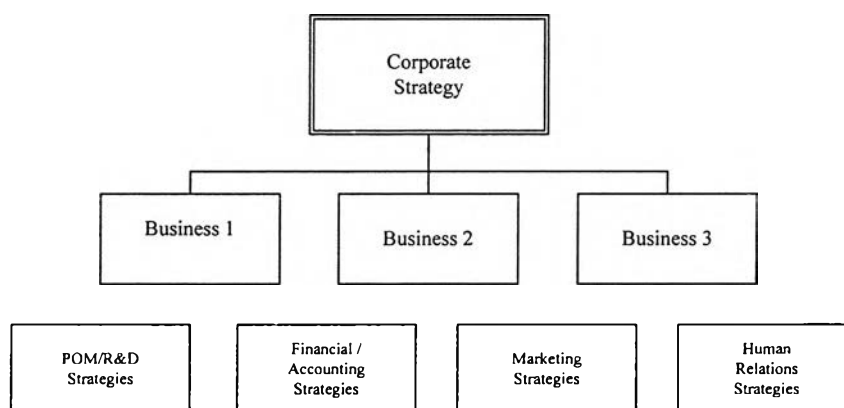
The decision making hierarchy of a firm typically contains three levels. At the top of this hierarchy is the corporate level, composed principally of a board of directors and the chief executive and administrative officers. They are responsible for the firm’s financial performance and for the achievement of nonfinancial goals, such as enhancing the firm’s image and fulfilling its social responsibilities.

In the middle of the decision-making hierarchy is the business level, composed principally of business and corporate managers. These managers must translate the statements of direction and intent generated at the corporate level into concrete objectives and strategies for individual business divisions or SBUs.

At the bottom of the decision-making hierarchy is the functional level, composed principally of managers of product, geographic, and functional areas. They develop annual objectives and short-term strategies in such areas as production, operations, research and development, finance and accounting, marketing, and human relations.

Figure 2.1 depicts the three levels of strategic management as structured in practice.

**Figure 2.1: Strategic Management Structure**



The characteristics of strategic management decisions vary with the level of strategic activity considered. The decisions at the corporate level tend to be more value oriented, more conceptual, and less concrete than decisions at the business or functional level. The functional-level decisions implement the overall strategy formulated at the corporate and business levels. They involve action-oriented operational issues and are relatively short range and low risk. Business-level decisions help bridge decisions at the corporate and functional levels. Such decisions

are less costly, risky, and potentially profitable than corporate-level decisions, but they are more costly, risky, and potentially profitable than functional-level decisions.

## **2.3 Measurement Tools and Techniques**

The measurements must be linked to business strategy and be meaningful within the context of the business as a whole. The most popular evaluation techniques are 1) economic value added, 2) activity-based costing/ management, 3) process value analysis, and 4) balanced scorecard.

### **2.3.1 Economic Value Added (EVA)**

Economic value added simply balances a company's profitability against the capital it employs to generate this profitability. If a company's earnings, after tax, exceed the cost of capital employed in the business, EVA is positive.

A definition of EVA is net operating profit after taxes (NOPAT), less an internal charge for the capital employed in the business.

Advantages of EVA vary in several ways: It aligns employee behavior with stockholder value generation, separates employee incentive compensation from the traditional performance measurement that compares actual to budgeted results, and is relatively easy to communicate and understand. It also can be boiled down into a message that all parts of the organisation can understand and apply to their daily activities.

### **2.3.2 Activity-Based Costing/Management (ABC/ABM)**

ABC/ABM advocates linking real activities to the drivers of cost. For example, an automobile manufacturer links the manufacturing costs such as direct labor, cost of equipment, facility maintenance, and power.

Advantage of ABC/ABM is that companies can know their true profitability and make business decisions on this basis. However, it does have its limitations. The primary problem with ABC arises when capacity consumption is a driver of cost allocation such as airlines business.

### **2.3.3 Process Value Analysis (PVA)**

This method requires an understanding of how the activities link together into processes, how those processes should operate, and how they fail.

The component of PVA is a process map. A map showing the activities and their interrelations is drawn for each process. This graphical representation assists in discussion on how to make improvements in the following aspects: eliminating duplicated activities; avoiding generating unnecessary information; avoiding unnecessary decision points; combining process flows; separating process flows; avoiding unnecessary movement; synchronising activities.

PVA approach has a limitation in identifying where the process is failing and how to improve it.

### **2.3.4 Balanced Scorecard**

The Balanced Scorecard is a new framework for integrating measures derived from strategy. The Balanced Scorecard translates an organisation's mission and strategy into a comprehensive set of performance measures that provides the framework for a strategic measurement and management system. While retaining financial measures of past performance, the Balanced Scorecard introduces the drivers of future financial performance. The drivers, encompassing customer, internal-business-process, and learning and growth perspectives, are derived from an explicit and rigorous translation of the organisation's strategy into tangible objectives and measures.

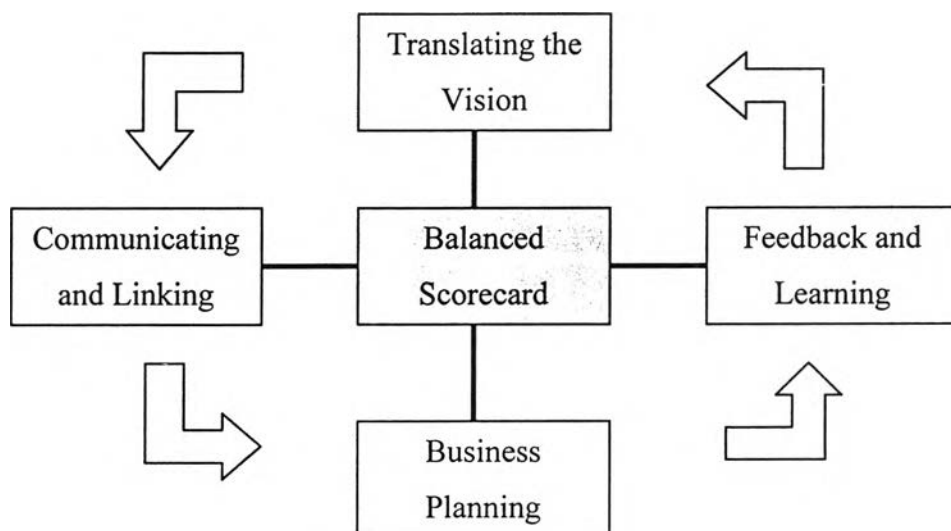
The Balanced Scorecard is more than a new measurement system. Innovative companies use the scorecard as the central, organising framework for their management processes. The real power of the Balanced Scorecard occurs when it is transformed from a measurement system to a management system.

The Balanced Scorecard fills the void that exists in most management systems – the lack of a systematic process to implement and obtain feedback about strategy. Management processes built around the scorecard enable the organisation to become aligned and focused on implementing the long-term strategy.

## 2.4 Balanced Scorecard

Kaplan and Norton stated 1996 that the BSC introduces four new processes (see Figure 2.2)

**Figure 2.2: Managing Strategy: Four Processes**



There are 4 critical processes for making the Balanced Scorecard work.

- 1) Clarify the vision and translate the strategy.

This starts with the senior management team or board. The scorecard assumes that the strategy has been developed based on a process-based view of a generic company. To clarify and translate the vision and strategy the company has to look at measures from four different perspectives.

**Table 2.1: Kaplan and Norton's Four Perspectives**

Financial Perspective	How do we look to shareholders?
Customer Perspective	How do our customers see us?
Internal Business Perspective	What must we excel at?
Innovation and Learning Perspective	Can we continue to improve and create value?

### 2) Communicate and link strategic objectives and measures

The Balanced Scorecard's strategic objectives and measures are communicated throughout an organisation via company newsletters, bulletin boards, videos, and even electronically through groupware and networked personal computers.

The scorecard also provides the basis for communicating and gaining commitment to a business unit's strategy with corporate-level executives and the board of directors. The scorecard encourages a dialogue between business units and corporate executives and board members, not just about short-term financial objectives, but about the formulation and implementation of a strategy for breakthrough performance for the future.

### 3) Plan, set targets, and align strategic initiatives

Once the measures are established the company has to develop improvement plans to ensure targets are met. The scorecard has been found to work best when driving organisational change with stretch targets. These stretch targets can come from several sources. Ideally, the targets for the customer measures should be derived from meeting or exceeding customer expectations. Both existing and potential customer preferences should be examined to identify the expectations for outstanding performance.

Once targets for customer, internal-business-process, and learning and growth measures are established, managers can align their strategic quality, response time, and reengineering initiatives for achieving the breakthrough objectives.



The planning and target-setting management process enables the organisation to:

- quantify the long-term outcomes it wishes to achieve,
- identify mechanisms and provide resource for achieving those outcomes, and
- establish short-term milestones for the financial and nonfinancial measures on the scorecard.

#### 4) Enhance strategic feedback and learning

The final management process embeds the Balanced Scorecard in a strategic learning framework. This process is considered to be the most innovative and most important aspect of the entire scorecard management process. This process provides the capability for organisational learning at the executive level. It enables executives to monitor and adjust the implementation of their strategy, and, if necessary, to make fundamental changes in the strategic itself.

## 2.5 Key Performance Indicator (KPI)

Generally, KPI is used to describe a particular value or characteristic designated to measure input, output, outcome, efficiency or effectiveness. They are composed of a number and a unit of measure. The number provides the magnitude (how much) and the unit is what gives the number its meaning (what).

KPIs are linked to a business goal. They typically consist of anything else that is deemed critical to a company's success and used to measure the progress that the company is making. In general, every KPI has a target value that may change over time. The actual value of the KPI is compared to the target value to determine how much progress has been made towards achieving the business goal.

## 2.6 Quality Improvement

### 2.6.1 Definition of Quality

Definition of quality varies in many aspects as follows.

- **The concise Oxford Dictionary** - "A degree of excellence."

- **British Standard 4778** – “The totality of features and characteristic that bear on the ability of a product or service to satisfy a given need.”
- **Dr. W. E. Deming** – “Improvement of the process, which increases uniformity of output of product, reduces rework and mistakes, reduces waste of manpower, machine-time, and materials, and thus increases output with less effort.”
- **Dr. A. V. Feigenbaum** – “The total composite product and service characteristics of marketing, engineering, manufacture, and maintenance through which the product and service will meet the expectations of the customer.
- **P Crosby** – “Conformance to requirements.”

### 2.6.2 Continuous Improvement

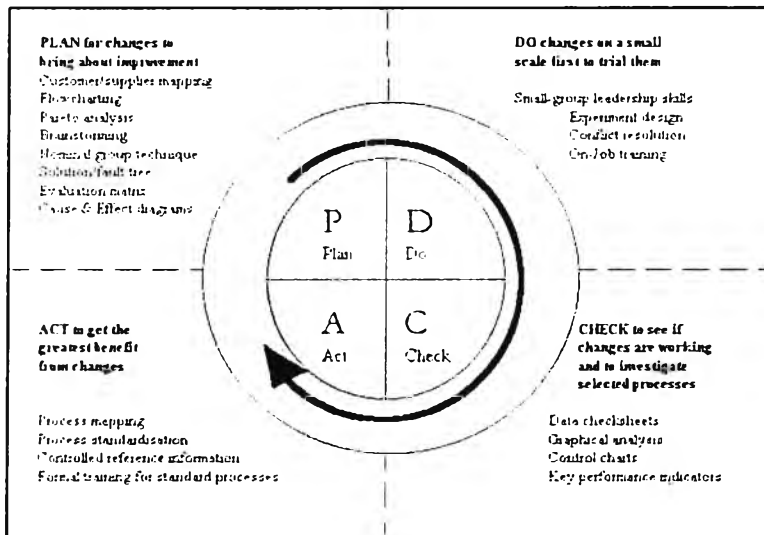
In 1939, Dr. Shewhart a former pioneering statistician at Bell Telephone was the first to develop and describe about the cycle in his book “*Statistical Method From the Viewpoint of Quality Control*”, the Shewhart Cycle Learning and Improvement cycle by combining creative management processes together with statistical analysis. The cycle was coined once again in 1950s when taken on by Dr. W. Edwards Deming, who popularised the concept in Japan. Deming encouraged the Japanese to adopt Shewhart cycle (PDCA or PDSA) Due to the Japanese’s spirit, they eagerly embraced PDCA along with other quality concepts (Deming’s 14 points and 7 deadly diseases principle). This enabled them to transform from reputation for shoddy goods to a country that has a tremendous influence on quality. Thus, the Japanese honoured Deming and ever since accredited as the “*Father of Quality*”, in which referred PDCA as the Deming cycle.

Continuous improvement is based on the Japanese concept called *Kaizen*. Kaizen is the philosophy of continually seeking ways to improve processes, products and/or services. Lies at the heart of the continuous improvement philosophy are

ongoing four stage activities to get from 'problem-faced' to 'problem-solved', which is referred to as **PDCA cycle** or is also known as the **Shewhart cycle** and the **Deming cycle** (or Wheel).

**Figure 2.3: Evolution of the PDCA Cycle**

**Source – <http://www.hci.com.au/hcisite2/toolkit/pdcacycl.htm#Plan-Do-Check-Act>**



1) Plan:

- a. Improvement team begins by realising that there is a need for an improvement on process (or for example; activity, method, machine, or policy and etc)
- b. Analyse and document selected process
- c. Sets qualitative and/or quantitative goals for improvement
- d. Formulate various strategies and pick one to achieve the goals
- e. Develop a plan with quantifiable measures for improvement.

2) Do:

- a. Plan on the scale of implementation/experiment to minimise disruption
- b. Improvement team implements the plan and monitors progress

3) Check (or Study):

- a. Analyse the data collected during the *Do* step, finding out how the outcome goes as according to the goals set in the *Plan* step.

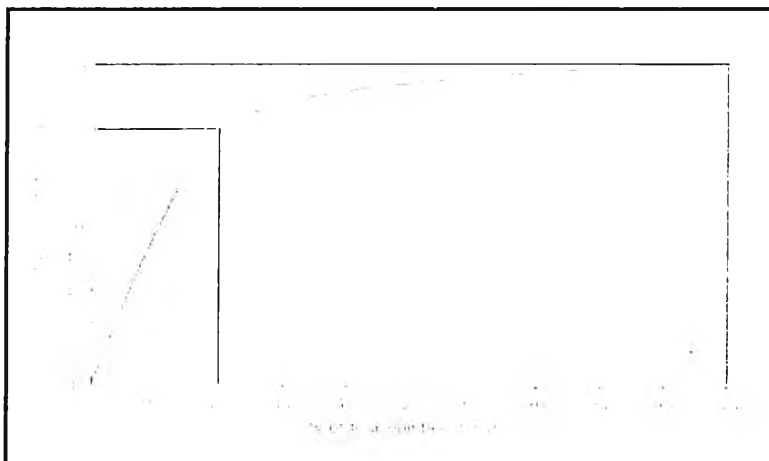
- b. If the solution proves ineffective, the team returns to the *Plan* stage and repeat the process.
- 4) Act:
- a. If the measurable outcome proven to be effective, the team update documents the revised process so that it becomes the standard procedure.
  - b. Perform training as necessary to ensure that the new standard procedure is fully integrated.

## 2.7 Pareto Analysis

In 1906, the Italian economist and avid gardener, Vilfredo Federico Damaso Pareto studied the distribution of wealth in Italy as well a variety of countries in which he noticed an unequal distribution of wealth in his country and in most countries that 80 percent of the land was owned by 20 percent of the population. Pareto later observed this noteworthy disproportion/ratio applies to other parts of life for example gardening: 80 percent of his peas were produced by 20 percent of the peapods. Pareto called this a “predictable imbalance”, which over time this concept became better known as “The 80:20 Rule”, “The Pareto’s Principle”, and “The Pareto’s Law”. Dr. Joseph Juran, who recognised this universal principle while working in the US in 1930s and 40s, he called this “The Vital Few and Trivial Many”. This principle of 80:20, the inverse proportion is shown below by a simple symmetry, where the smaller first part increases to the larger second part as shown by the shaded areas. Ones might quibble about the 80:20 ratios (80% to 20%) it may sometimes be 60:40 or 90:10, the most important concept of this however must be recognised and that being two individuals are inversely proportional to one another.

### Figure 2.4: Pareto Chart

Source: Manufacturing Systems Engineering Lecture Notes, University of Hertfordshire, 1999



Pareto analysis is used in selecting the most important items to receive attention when presented with a problem. The 80/20 rule, is that 80 percent of content of a total is made up by 20% of the contributors. For example, it is common to find that 80% of the sales revenue of a company is produced by 20% of the products. Similarly, 80% of rejects are usually due to just 20% of the possible causes.

## 2.8 P and D Ratio

P and D ratio is a way of characterising the graduation between resource-to-order planning and control and make-to-stock planning and control by contrasting the total length of time customers have to wait between asking for the product or service and receiving it, demand time, D, and the total throughput time, P. Throughput time is how long the operation takes to obtain the resources, produce and deliver the product or service.

In a typical make-to-stock supply such as those making consumer durable, demand time, D, is the sum of the times for transmitting the order to the company's warehouse or stock point, picking and packing the order and physically transporting it to the customer – the deliver cycle. Behind this visible order cycle, however, lie other cycles. Reduction in the finished goods stock will eventually trigger the decision to manufacture a replenishment batch. This cycle – the make cycle – involves scheduling work to the various stages in the manufacturing process. Physically this

involves withdrawing materials and parts from input inventories and processing them through the various stages in the manufacturing process. Physically this involves withdrawing materials and parts from input inventories and processing them through the various stages of the manufacturing route. Behind the 'make' cycle lies the purchase cycle – the time for replenishment of the input stocks – involving transmitting the order to suppliers and awaiting their delivery.

Therefore, the demand time which the customer sees is very short compared with the total throughput cycle for this type of manufacturing. Contrast this with a resource-to-order operation. The make-to-order operation lies in between these two.

The essence of this approach is how much the company can make  $D$  smaller than  $P$ . This indicates the proportion of the operation's activities which are speculative, that is carried out on the expectation of eventually receiving a firm order for the work. The speculative element in the operation is not there only because  $P$  is greater than  $D$ . It is there because  $P$  is greater than  $D$  and demand can not be forecast perfectly. When  $P$  and  $D$  are equal no matter how inaccurate the forecasts are, speculation is eliminated because everything is made to a firm order. Reducing the  $P:D$  ratio becomes a way of taking some of the risk out of operations planning and control.

## 2.9 Literature Reviews

**Kaplan and Norton (1992)** have devised a framework "Balanced Scorecard" for an integrated performance measurement system for strategic, operational and financial measures. The balanced scorecard provides answers to four basic questions: How do customers see us? (Customer perspective); what must we excel at? (Internal perspective); Can we continue and create value? (Innovation and learning perspective); and How do we look to shareholders? (Financial perspective.) The balanced scorecard includes financial measures that tell the results of actions already taken. And it complements the financial measures with operational measures on customer satisfaction, internal processes, and organisation's innovation and

improvement activities-operational measures that are the drivers of future financial performance.

**Hyman Grant** has proposed the sample implementation of a KPI scorecard in “The Human Impact of Balanced Scorecarding” article. He has summarised that the key requirement of balanced scorecard implementation is that each Scorecard be relevant and be able to provide the right information to enable dependent Scorecards to be also relevant.

**Prasert Kunapis (1996)** proposes a quality control system development process for small arms ammunition process. The procedure of study started from data collection and analysis of the present work system. By employing “Pareto Diagram”, the major problems including the source of problems were identified. The revised inspection and test plan has proposed and tried-out based on quality control techniques.

The result of the implementation of the revised inspection and test plan, showed that the ‘final cutting of the tube’ operation problem can be solved by recalibration of the equipment. The improvement of process capability ( $C_p$ ) improves from  $C_p=0.729927$  to  $C_p=1.291489$ , which is very close to the standard value.

**Jakkrawarn Kunadilok (1995)** studied the quality control system development for the food can industry with the main objective in re-organise the quality control scheme in the food can industry and to improve production process. The case study is the factory producing lacquer coated sheet, and cover.

The study focuses on the improvement of the quality control in the production process and the inspection of the final product. The improvement are divided into three steps; production process improvement, quality control process improvement and final product inspection improvement.

The result after implementation showed that number of defects from production had been reduced.

**Thana Boonprasit (1994)** studied the way to improve the quality inspection system of incoming parts and production processes using a refrigerator factory. The author has proposed to designing and improving the document system used in the quality inspection task, setting the training courses for staffs and inspectors, and developing the performance indication and corrective action system.

After implementation, the rejection of incoming parts was reduced by 22% and the quantity of the defective product using the sampling inspection was reduced by 41%.