Competitiveness and Operations Strategy

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Unit Introduction

As citizens of the global village we are all increasingly conscious of the intensely competitive world we live in today. Without the competitive edge, no economic unit can survive. Free market economies and rapid globalization highlight the necessity of being proactive, and anticipating changes to keep pace with or rather stay ahead of the competition. Competitiveness is an important factor in determining whether a company prospers, barely gets by, or fails. To meet this competitive challenge, every business needs to be focused on strategic planning in their operations management - what is known as 'Operations Strategy'. Effective operations strategies lead to productive, competitive organizations, and primarily aims at improving competitiveness. Hence, there exists a direct link between effective operations strategy and competitiveness. The goal of this unit is to present a detailed conceptual framework for the management of the operations strategies in organizations. The main aspects covered in this unit are, Competitiveness and Competitive Advantage, Operations Strategy, and competitive issues like Productivity, Quality, Technology and Globalization. These are separate but related topics that are vitally important to business organizations. Competitive issues like productivity relate to how effective an organization is in the use of its resources; competitiveness relates to how effective an organization is in the marketplace compared with other organizations that offer similar products or services. And strategies, especially operations strategies, shape the plans that determine the direction an organization takes in pursuing its goals.

Lesson One: Competitiveness and Competitive Advantage

Lesson Objective
After completing this lesson you will be able to:

- Explain the meaning of competitiveness
- Identify the different distinctive competitiveness
- Discuss the traditional and modern views of competitiveness
- Justify the importance of competitiveness in operation strategies

Understanding competitiveness and its importance in operations strategies
Competition and market conditions in the industry guide the general thrust of the operations process, which provide the basis for determining the organization's strategy. A careful analysis of market segments and the ability of the competitors to meet the needs of these segments will determine the best direction for focusing an organization's efforts. In doing so, competitive priorities should be established in the various areas of an organization. These will help the managers identify their abilities or competencies, which will arm the organization with the competitive edge.

Distinctive Competencies
One way to compare manufacturing among industrial centers is to examine the varying competitive priorities, such as, quality, performance, price, adaptation, after sales service, etc. Competitiveness or competitive advantage denotes a firm's ability to achieve market superiority over its competitors. In the long run, a sustainable competitive advantage provides above-average performance. A strong competitive advantage is derived from an organization's competitive priorities, or rather ***distinctive competencies***. A distinctive competency should have six (6) characteristics:

> Competitiveness or competitive advantage denotes a firm's ability to achieve market superiority over its competitors.

i. It is driven by customer wants and needs.
ii. It makes a significant contribution to the success of the business.
iii. It matches the organization's unique resources with the opportunities in the environment.
iv. It is durable and lasting and difficult for competitors to copy.
v. It provides a basis for further development.
vi. It provides direction and motivation to the entire organization.

Hence, we can conclude that distinctive competencies can be defined as those special attributes or abilities possessed by an organization that give it a competitive edge. In effect, distinctive competencies relate to the way that organizations compete. The most effective organizations seem to use an approach that develops distinctive competencies based on customer needs as well as on what the competition is doing. Merely matching a competitor is not sufficient, it is necessary to exceed the quality level of the competitor.

Depending on these distinctive competencies any company can achieve competitive advantage[1] through acts of innovation and new ways of doing things, such as new product designs, production technologies, training programs, quality control techniques, or new way to manage supplier relationships. It is also to be noted that mere competence does not constitute a competitive advantage. The best performing company will be the one that can generate greatest customer

> The best performing company will be the one that can *generate greatest customer value and sustain it over time.*

[1] Porter, Michel E. "Competitive Advantage of Nations," *Harvard Business Review*. (March – April, 1990).

value and sustain it over time. For example Virgin cola was marketed in a premium price of Tk.15 per can, which is still the cheapest drink in canned form, whereas the other contemporary drinks cost at least Tk.20 per can. Actually, virgin succeeded to fulfill the customer need not only through its price but also through its form which makes the customer feel distinctive from others. However, the differentiation in the form gave virgin brand distinctive competencies and market superiority over other brands in the market.

Four (4) Distinctive Competencies /Competitive Priorities

The four distinctive competitive priorities can be characterized as follows (Table 2.1.1):

1. *Cost Efficiency* (Low product price): A company that emphasizes *cost efficiency* will see that it's capital, labor and other operating costs are kept low, relative to other similar companies.
2. *Quality* (Product performance): A company that emphasizes *quality* will consistently strive to provide a level of quality that is significantly superior to that of its competitors, even if it has to pay extra to do so.
3. *Dependability* (reliability, timely delivery): A company that stresses *dependability* can be relied upon to have its goods available for customers, or to deliver its goods or services on schedule, if it is at all possible.
4. *Flexibility* (new products or change in output volume): A company that develops *flexibility* can quickly respond to competitors' changes in product design, product mix, or production volume by changing their own.

Table 2.1.1 Competitive priorities and some ways of creating them

Competitive Priority	Definition	Some ways of creating
Cost Efficiency	Unit cost of each product / service, including labor, material, and overhead costs	• Redesigning of products • New production technologies • Increase in production rate • Reduction of scrap • Reduction of inventories
Quality	Customers' perceptions of degree of excellence exhibited by products /services	• Use of CAD / CAM • Improve product / service in terms of : appearance, malfunction or defect rates, performance and function, war, endurance ability, after-sales service
Dependability (Delivery performance)	Fast delivery	• Larger finished-goods inventories, effective scheduling system • Faster production rates • Quicker shipping methods
	On-time delivery	• More realistic promises • Better control of production of orders • Better information systems
Flexibility	Ability to quickly change production to order products /services and other production volumes, customer responsiveness	• Change in type of production process used • Multi-skilled workers • Reduction of amount of work in process through JIT • Increase in production capacity

Time as a Distinctive Competency

Apart from the four factors (Cost efficiency, quality, dependency and flexibility), t*ime* is emerging as a critical dimension of competition in both manufacturing and service industries. In any industry the firm with the fastest response to customer demand has the potential to achieve overwhelming market advantage. In an era of time-based competition, a firm's competitive advantage is defined not by cost but by the total time required to produce a product or service. Firms able to respond quickly have reported growth rates over three times the industry average and double the profitability. Thus the payoff for quick response is market dominance. These basic strategic choices, then, set the tone for the shape and content of the operations function and what it accomplishes. A conversion process designed for one type of focus is often ill suited for success in another, alternative focus.

> Time is emerging as critical dimension in every types of industry.

Traditional View of Competitiveness

The traditional literature on competitiveness suggests that a firm can possess two basic types of competitive advantages:

i. Cost leadership
ii. Product differentiation

i. Cost Leadership

Many firms gain competitiveness by establishing themselves as low-cost leaders in the market. These firms produce high volumes of mature products and achieve their competitive advantage through low prices. Such firms often enter markets that were established by other firms. They emphasize achieving economies of scale and finding cost advantages from all sources. Low cost can result from high productivity and high capacity utilization. More importantly, improvements in quality lead to improvements in productivity, which in turn lead to lower costs. Thus a strategy of continuous improvement is essential to achieve a low-cost competitive advantage.

> Low cost leadership can be achieve through producing high volumes of product with low price.

For example in the 1980's GQ group in Bangladesh introduced *Econo* ballpoint pen to the market at a cost of Tk. 3 per unit. This introduction brought a prompt change in consumers' satisfaction and consumption level. The reason behind this is their quality product in low cost which shook the market of the other existing ball point pens, even Red Leaf and Staedtler, the two product leaders. Thus Econo's low cost resulted in high productivity and the greatest market share.

ii. Product Differentiation

Product differentiation refers to any special features (e.g. design, cost, quality, ease of use, convenient location, warranty, etc.) that cause a product to be perceived by the buyer as more suitable than a competitors product or service. To achieve differentiation, a firm therefore must be unique in its industry along some dimensions that are widely valued by customers. It selects one or more attributes that customers perceive as important and positions itself uniquely to meet those needs. As a result, it can command premium prices and achieve higher profits. However, a firm that uses differentiation cannot ignore costs. It must achieve a cost position at par with its competitors and reduce costs in all areas that do not affect differentiation.

> To achieve product differentiation a firm therefore must be unique in its industry along some dimensions that are widely valued by customers.

A part of cost-efficiency & product differentiation the modern view includes quality & time towards competitiveness.

Modern View of Competitiveness

More recently, the modern view towards competitive advantage has been focused on adopting more *Quality-based* and *Time-based* competitiveness. However at the same time keeping in mind cost-efficiency and product differentiation.

- **Quality**

This focuses on satisfying the customer by integrating quality into all phases of the organization. This includes not only the final product or service that is provided to the customer, but also the related processes such as production, design, and after-sales service.

- **Time**

It focuses on reducing the time required to accomplish various activities. By doing so, organizations seek to improve services to the customer, and to gain a competitive advantage over rivals who take more time to accomplish the same tasks.

Importance of Competitiveness in Operations Strategy

As we have defined earlier, the competitiveness of a firm is its ability to achieve market superiority over other competitors. Operations strategy, on the other hand, is a collective pattern of coordinated decisions for the formulation, reformulation, and deployment of the organization's resources. These decisions provide a competitive advantage in support of the overall strategic initiative of the firm or strategic business units. Operations strategy is a pattern of decisions made over time. These decisions focus on resource configuration and deployment. For example, how many work shifts, which type of machinery, what kind of reporting structure, and which type of information to use are all decisions about how to use resources. The resulting configurations of the firm's resources must provide or support the firm's strategic advantage in the market place. So for the survival of the firms, considerations of competitive advantage in operation strategy are very important.

Summary

Competitiveness or competitive advantage of a firm denotes its ability to achieve market superiority over its competitors. In other words how effectively an organization meets the needs of customers relative to other organizations of the same specialization represents its competitive advantage. Characteristics of competitive priorities are product performance, low product price, dependability and flexibility. The management effort towards improvements in quality lead to improvements in productivity, which in turn lead to lower costs. Cost is a vital factor for surviving in the market. Therefore many firms gain competitiveness by establishing themselves as low cost leaders in the market.

Cost Efficiency or Differentiation

Case Analysis

Well-done Garments is a firm that has recently entered the ready-made garments industry. The managing director is concerned about gaining market share. Currently Jolly Zee Apparels dominates the market, in terms of exports. Mr. Khan the MD is contemplating a change in certain aspects of the company's operations. At the moment he refuses to compromise on the level of quality maintained, and consequently it is difficult to keep costs low. However this higher quality has given them the best reputation among the new comers in the market. The company focuses on-time delivery, but being small firm lacks flexibility in technological terms. Jolly Zee Apparels follows a cost leadership model, offering lower prices to foreign buyers. Mr. Khan is considering cutting costs, and charging lower prices to attract large orders. He hires a consultant before making a final decision.

Case questions

1. What is the category in which the company's competitive advantage can be classified?
2. Do you feel that Well-done Garments should concentrate on improving its cost-efficiency first, and then shift its focus to differentiation?
3. Assuming you are the business consultant, what advice would you give Mr. Khan?

The causes of poor Competitiveness

Case Analysis

According to the report of the BASC (Business Advisory Service Center) there are some basic causes of poor local and global competitiveness of Bangladeshi firms or companies. The decision making process of these companies is based on short term horizons which results in under investment in research and development. They failed to recognize the threats posed by foreign competitors, neglected the manufacturing function relative to other functional areas of the company and under invested in physical and human capital. There is a lack of cooperation among departments within firms that led to too little communication among marketing, product design, process design engineering and manufacturing. Consequently, firms have ended up with products unsuitable to customer needs or wants, products that needed redesigning, products unsuitable to the manufacturing capabilities of an organization, and products lacking sufficient quality to be competitive in the market place. Moreover, most of the companies or firms have the tendency to view labor as a cost factor to be minimized instead of a valuable resource underestimating the importance of training, motivation and adaptability. Finally, there are some weaknesses in technological practice, often characterized by emphasizing rapidly to the market, and subsequently, to a loss of market position.

Case questions

1. As a manager, do you agree with the causes of poor competitiveness traced out by the BASC? If yes, than how will you handle the problems to overcome the situation? If no, then give reasons to support your opinion.
2. Define your production/operation strategy. Describe how your strategy leads your organization to a competitive advantage.

Discussion questions

1. What do you understand by the term competitiveness?
2. Suppose you are a production manager in a finished leather based goods industry. Earnings of your company have been reduced this year. Your top-level management asked you to find the reasons for incurring less profit and how to overcome such types of problems. How would you analyze the situation to make your recommendations?
3. How are considerations of competitiveness important for operation strategy?
4. ‘Competitiveness is driven by customer wants and needs’- Explain.
5. Give a real life example of competitive advantage of an organization which is difficult to copy.
6. ‘Improvements in quality lead to improvements in productivity’- Do you agree? Justify your answer.

Lesson two: Operations Strategy

Lesson Objectives

After completing this lesson you will be able to:

- Understand the key issues of corporate and operations strategies
- Explain the formulation of strategic planning
- Identify the operations strategy frame work
- Discuss the operations function positioning decision
- Explain the modern view of organizational strategies

Operations: A Vital Element in Strategy

The operations function has great value as a competitive weapon in a company's strategy and consequently plays an important role in implementing a strategy. The operations function establishes the desired level of quality as a product is manufactured or as a service is provided. Often it is responsible for the largest portion of the company's human and capital assets. Thus much of a product's cost is incurred within operations, and this cost affects the price that must be charged and the profit margin that can be achieved. Finally, the ability of the operations functions to perform determines, to a great extent, the ability of the company to have sufficient products available to meet delivery commitments.

Corporate and Operations Strategies

Largely because of foreign competition and the technological explosion, there is a growing recognition that a firm competes not only with new products, creative marketing, and skillful finance, but also with unique competencies in operations. The organization that can offer superior products and services at lower prices is a formidable competitor. It is clear that the operation function has an important influence on the cost, quality, and availability of the company's goods or services. Therefore, it is an organization's operations that determine its distinctive competencies.

Whatever the type of organization, top management is responsible for relating the organization's efforts to its long-term future, setting a corporate strategy. Putting it in a different way, their responsibilities include determining the organization's mission (the broadest expression of the direction in which a company will apply its efforts), monitoring and adjusting to changes in the environment, and of identifying the organization's *distinctive competencies*. Corporate strategy is a long-term master plan of how the company will pursue its mission. It establishes the general direction in which the company will move. Operations strategy specifies how operations can achieve the organization's overall goals, within the framework of corporate strategy. Therefore the operations strategies are in more detail than the corporate strategy and therefore allows every level of management to do their best to achieve the organization's mission.

Corporate strategy is a long-term master plan of how the company will pursue its mission

Corporate strategy provides focus to design operations strategies

Corporate strategy is an outcome of scan of the socio-econo-political environment plus the market in which the organization functions or planning to function. In brief, it is the goal or target that it wants to achieve in the long run. The goal determines the techniques, called competitive priorities, that would be used in competition. Nature of the competitive priorities selected determines the operations strategy that would come into play in behalf of the corporate strategy.

(a) Involvement of top management
Top managers formulate strategies to provide more definitive direction and guidance to the organization. In formulating strategies, top managers establish corporate objectives and make broad-reaching decisions on such matters as the breadth of the product line the company will choose to offer, the geographical scope it will try to serve, the types of social involvement in which the company will engage, the amount of resources that will be committed to various company endeavors and the performance objectives for such matters as the company's market share, growth, and profitability.

(b) Communication strategy and coordinated effort
Communication Strategy is vital to achieve a coordinated effort. It is logical that decisions and actions within a company will be better coordinated and will be more consistently directed toward the company's strategic goals if the company's strategy is explicitly recognized. Objectives and policies that are consistent with the overall strategy should, therefore, be formulated, communicated, and recognized throughout the organization. Operations managers and managers in all parts of the company must formulate plans and make decision within the context of the corporate strategy and policies if they are to achieve a unified effort towards corporate objectives. Strategies and tactics for the functional areas must be formulated to be consistent with corporate objectives and strategy. This process results in a hierarchy of lower-level objectives aligned to carry out the corporate strategy.

Different Strategies for Different Operations
Different companies in the market produce different kinds of products and services. Each product has its own specialty. So keeping that in mind the strategy of different operations should be different to accommodate the different circumstances and objectives. Table 2.2.1 highlights different strategies for different operations.

Table 2.2.1 Different strategies for different operations

Type of Operation	Type of Product	Typical Process Characteristics	Typical Characteristics of Market Strategy
Service/ Project	Make to order as customer specifies	Use of broadly skilled workers, general purpose equipment, emphasis on good initial planning, quality, flexibility.	Ability to provide desired features, to perform a quality job, and to achieve reasonable delivery times.
Continuous/ Process	Standardized	Use of specialized workers, equipment, automation, emphasis on cost-efficiency and good distribution system to make items readily available	Market research to ensure desirability of features; selling an already designed product, and the desirability of the price, availability, service

Strategic Planning & Strategy Formulation
The best way to determine an organization's strategy is to observe what the organization actually accomplishes over time. Strategic planning is built on a few

fundamental concepts. Here current decisions are based on future desired conditions and results. Strategic planning is a process. It embodies a philosophy and provides a linkage or structure within the organization. Strategic planning is the process of thinking through the current mission of the organization and the current environmental conditions facing it, then setting forth a guide for tomorrow's decisions and results. Operations managers introduce strategic plans to their work-areas for production and operations, and then identify several competitive pressures that managers can turn into operating advantages for their firms. In the operations function, strategic planning is the broad, overall planning that precedes the more detailed operational planning.

In the strategic plan current decisions are based on future conditions & result.

In the organization the operations strategic plan is depended upon as the basis for operational planning of facilities and operational planning for the use of these facilities. Therefore, it is important to note that operational planning should not be done in vacuum. It must come under the umbrella of an effective strategic planning. There are three contrasting modes of strategic planning:

i. *Entrepreneurial mode*, where one strong, bold leader takes planning action on behalf of the production/operations function.
ii. *Adaptive mode*, where a manager's plan is formulated in a series of small, disjointed steps in reaction to disjointed environment.
iii. *Planning mode*, which uses planning essentials combined with the logical analyses of management science.

The key point in strategic planning approaches is that the operations strategies must be consistent with the overall strategies of the firm. A strategic planning model for operations is shown in Table 2.2.2. Here, in-group sessions or individually, analysts assess environmental considerations together with the organization's current production/operations position, thus forcing management to formulate strategic options for operations.

Operations strategies must be consistent with the overall strategies of the firm.

Table 2.2.2: A strategic planning model

Environmental Assessment	**Organization's Position**
Broad economic assumption ↓	Statement of mission ↓
Key governmental/regulatory threats ↓	Interrelation set of financial and non-financial objectives ↓
Major technological forces ↓	Statement of strengths and weaknesses ↓
Significant marketing opportunities/threats ↓	Forecast of operations: profits and cash flows ↓
Explicit competitive strategies for each major competitor ↓	Major future programs ↓
STRATEGIC OPTIONS Strategic options (at least two) Requirements for implementing each strategy Contingency plans	

Operations Strategy Framework

Operations strategy, for both manufacturing and services, tries to link the policy decisions associated with operations to the market place, the environment, and the company's overall goals (Table 2.2.3). The four distinctive competencies (market-based criteria for success) mentioned in Lesson 1 are shown here linked to corporate strategy.

Table 2.2.3: Operations strategy framework

ENVIRONMENT AND INDUSTRY → **CORPORATE STRATEGY** ← **CORPORATE RESOURCES**

↑

Cost efficiency
Dependability
Quality
Flexibility

↓

Facility Mission

↓

Process	**Capacity**	**Facilities**	**Vertical Integration**	**Infrastructure**
Automation	Loading	Size	Supplier control	Planning and control
Product/Service specificity	Lead/Lag	Location	Customer control	Work force
Interconnectedness			Interdependencies	Quality control

One feature of this model that is crucial to competitiveness is the market-based view of strategic planning. It suggests that any strategic business unit of a company operates in the context of its corporate resources, the general and competitive industry environment, and the specific corporate goals of the company. In any area in which the company chooses to compete is a set of specific distinctive competencies or market-based criteria for success (Table 2.2.3). *Cost Efficiency* makes low price possible- a prime criterion for success. A low-cost, high productivity operations makes efficiency possible. Minimum use of scarce resources (labor, management, materials, equipment/facilities, and energy) while sustaining high outputs is the key to efficient productivity. *Dependability* is how well a company is able to meet specific criteria such as delivery schedules and technical capability. *Quality* is the degree to which the product or service meets customer and organizational expectations. *Flexibility* is adaptability to change as business conditions change. The following Table 2.2.4 will identify different features of the cost-efficiency, dependency, quantity and flexibility of an organization.

Table 2.2.4 Market-based criteria for success/ distinctive competencies

Cost-Efficiency		
Low price —	Low cost	
	High productivity	— Labor
		— Material
		— Energy
Dependability		
Delivery	Reliable	
	Rapid	
	Availability (from stock)	
	Design competence Technical capability	

Quality
High
Consistent
Flexibility
Fast introduction of new products and services
Wide product/service range

Given a specific operations mission established from the four market-based criteria for success (efficiency, dependability, quality, flexibility) operations managers must make choices in the following areas:

i. *Choice of Process*, i.e., the type, technology, and product/service produced.
ii. *Facilities,* e.g., the scale, location, and focus of the facilities.
iii. *Capacity,* i.e., the policies governing the management of the sum capability of all business units (the maximum production available).
iv. *Vertical integration*, i.e., the degree and nature of dependence from resources purchased through production to the consumer.
v. *Operations integration*, i.e., the labor policies, payment methods, systems of production and inventory control, which are key for management control.
vi. *Operations interface with other functions*, i.e., the mechanism for communicating with other functions.

Operations managers must link various decision areas in operations in the way that best complements corporate strategy.

The first four categories are normally recognized as long-term decisions that are difficult to reverse and therefore more likely to be considered strategic. The last two appear to deal with *tactical* matters, with decisions that are more concerned with day-to-day operating matters of an organization. The operations managers must link various decision areas in operations in the way that best complements corporate strategy. The organizational plans, policies, and actions within operations should focus in the same direction and be mutually supportive. Further quality, automation, capacity, and inventory decisions must not be made independently. Even though individual choices may make sense on their own, collectively they might not add up to the best result. The combinations of choices made in all of the areas listed above represent the operations strategy of a particular firm.

Finally the operations strategy must be changed and adapted to maximize the market criteria for success, or the chosen markets should be changed to match more closely to operations capability in terms of market criteria for success. This could be done through avoiding the following activities:

- Focusing on the manufacturing performance criteria that do not match the market criteria for success.
- Trying to produce goods in a single factory for markets with very different criteria for success.
- Trying to meet incompatible criteria for success with in a single market.

In doing so, production manager can develop functional strategy in areas such as finance, marketing, and manufacturing and therefore gather all the necessary information they can to design their corporate strategy to carry out the corporate objective.

Operation Function Positioning Decisions
Distinctive competencies or competitive priorities of any firm may be visualized as selecting a particular volume within a pyramid such as shown in Figure 2.2.1. *Positioning* establishes the extent to which the production system will emphasize certain characteristics in order to achieve the greatest competitive advantage. This is a broad strategic decision that is important in guiding and coordinating the actions of the operations.

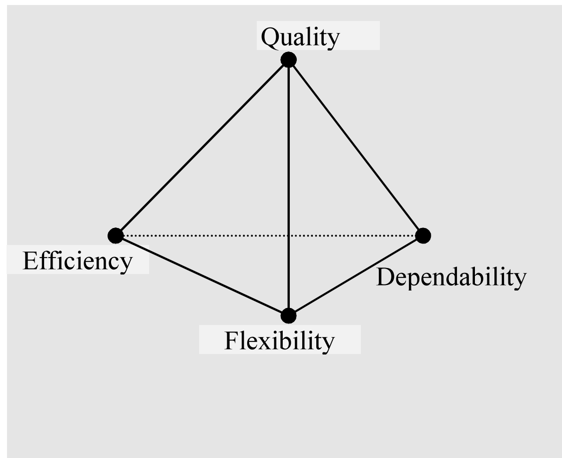

Figure 2.2.1: Possible positions of an operations function

The Pyramid defines the relative priorities that can be assigned to each of the four performance characteristics. However, the portion of the pyramid that a company management will try to occupy is a strategic decision of that firm. If each part of a company tries to move in any direction in which that part of the company believe a competitor is out performing the pyramid then the overall company's money, talents, and efforts will not be effectively expended.

Activity: Discuss why an organization can not be best on all the dimensions of pyramid?

Organization can't be best on all dimensions and further even if any firm try to do so, it will end up doing nothing well.

It is true that an organization cannot be best on all these dimensions. And if a firm tries to do so, then it will end up doing nothing well. Furthermore, when a competency exists in one of these areas, an attempt to switch to a different one can lead to a downfall in effectiveness. A company that tries to move in several directions simultaneously will not have a distinctive competence. In other words, it will not have a difference that sets it apart from its competitors so that customer prefers to deal with it rather than with the others. Further, customers can't rely on a company for consistent treatment if it frequently changes its priorities and emphasizes different characteristics.

Since a company cannot simultaneously cover all corners of the pyramid, it can expand the range of the pyramid covered by *shrinking the pyramid.* The effect is that a relatively larger percentage of the pyramid is covered, leaving less space for a competitor to develop a distinctive competency. Numerous Japanese companies have practiced *shrinking of the pyramid* in their operations. This is through stricter quality control, resulting in simultaneous improvement in quality and cost of repair and screening, and dependability. Multi-skilling of workers has improved flexibility

Environmental Scanning

Because strategy deals with broad issues and long range plans, therefore strategy formulation is a multifaceted activity. In the process of formulating strategies, managers must evaluate information about conditions in the company's internal and external environments. The key issues of these environment is discussed below.

External Conditions

Factors that influence a firm's operation from the external sources of that firm is known as external environment.

- *Economic Conditions*: These include the general health and direction of the economy: number of households and growth patterns in the target markets, current stage of the business cycle, interest rate, and employment level.
- *Political Conditions*: These include favorable or unfavorable attitudes to business: tariffs, foreign trade restrictions, monetary exchange rates, political stability in nations of interest and in neighboring countries, labor policy, fiscal and monetary actions.
- *Social Conditions*: Trends toward more leisure time and casual lifestyles etc.
- *Technological Conditions*: These can include the rate at which product innovations are occurring, current and future process technology and design technology.
- *Market conditions*: Functions of a potential product, needs and desires of customers, primary concentrations of present and potential customers, possible distribution methods, potential competitors, their location their strategies, their vulnerable points, barriers to enter into the market etc.
- *Legal Environment*: This includes anti-trust laws, government regulations, trade restrictions etc.
- *Competition*: This includes the number and strength of competitors, the basis of competition, and the ease of market entry.

Internal Conditions

There must be an adequate match between the key requirements of the market within which a company competes and the capabilities of the company. The purpose of internal reviews is to assess the company's capabilities to move forward when opportunities exist and to identify any weaknesses early enough to correct them, particularly if external conditions represent a threat in the area. Internal conditions that should be evaluated include:

The purpose of internal reviews is to assess the company's capabilities to move forward when opportunities exist and to identify any weaknesses.

- *Market understanding and appropriate marketing capabilities:* Access to markets and resources, company or product image, distribution channels
- *Existing products* (goods and services): These include existing products and services, and the potential for new ones.
- *Existing customers and relationships:* Loyalty, existing relationships, and understanding of customer wants and needs are important.
- *Existing suppliers, distribution & delivery networks and relationships:* Dependability of suppliers, quality, flexibility, relationships, and service are typical considerations.

- *Human resources:* These include the skills and abilities of managers and workers, special talents, loyalty to the organization, expertise, dedication and experience.
- *Current facilities, equipment, processes and locations:* Capacities, location, age and cost to maintain or replace can have significant impact on operations.
- *Available capital and financial strength:* Cash flow, access to additional funding, existing debt burden and cost of capital are important considerations.
- *Others:* Patents, labor relations, maintenance of facilities and equipment.

A basic objective of evaluating internal conditions is to determine how the company's resources can best be used to capitalize on the opportunities or to counteract the threats that are revealed by the external evaluation. Because conditions change and competitive actions and reactions occur, strategy development is a continuing activity. An operations manager must constantly study information about the factors outlined previously, reevaluating, and perhaps reformulating the company's strategy from time to time.

Activity: Why are both internal and external environment conditions equally important for designing the operations strategies? Discuss logically.

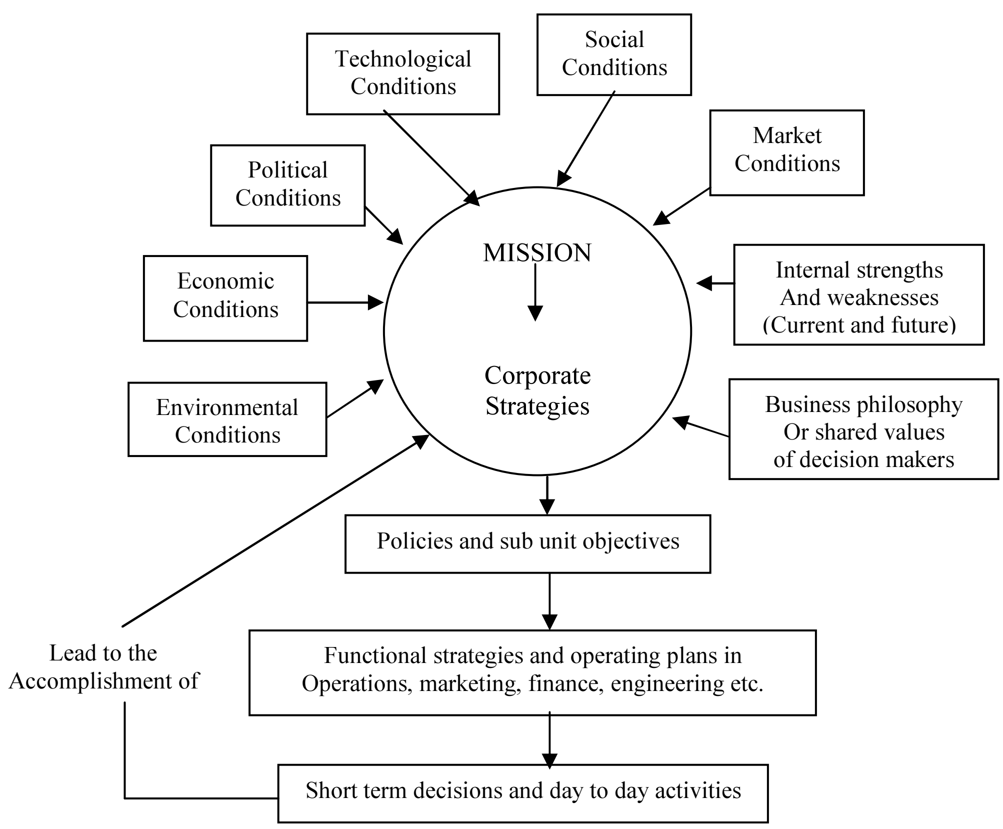

Figure 2.2.2: The desired relationship between strategy formulation and company activities

Figure 2.2.2 outlines the relationships among the elements and activities involved in formulating and implementing corporate strategy. It shows that various external and internal conditions influence the company's mission (The broadest expression of the direction in which a company will apply its efforts). Since activities in any part of the company can and do change, the company's strategy must be re-evaluated regularly. Here is an example how a broad array of external conditions can influence overall strategy.

Various external and internal conditions also influence company's mission.

Operations Impact of Nissan's Strategy	
Japan's automobile producers are now competing in what has become an enlarged and more competitive world car market. Nissan, maker of Datsun cars and trucks, appears to have effected a change of strategy in response to certain changes in the external environment, as outlined below: • *Social condition*: High unemployment among United States auto-mobile workers. • *Political condition*: US Congress' under pressure to erect trade barriers such as import quotas and higher tariffs. • *Technological conditions:* Aluminum used in light weight, high-mileage automobiles requires large amounts of energy to produce.	• *Economic conditions:* Japan's trade balance endangered because it imports 88% of its energy, and energy costs have multiplied in recent years. High costs of shipping coal, oil, and other resources to Japan and engines back to the United States. • *Strategic decision:* Produce engines in Mexico and assemble pickup trucks in the United States. • *Operation implications:* Engine production workers with lifetime employment must be retrained and assigned to other jobs. Production control becomes more difficult to coordinate when operations are scattered over several countries. Lead times to get engines for units assembled in Japan are longer. Larger inventories must be maintained to ensure that operation will not be interrupted.

New Strategies

The modern views of organizational strategies that are rapidly gaining favor throughout the business world are quality-based strategies and time-based Strategies.

(A) Quality-based strategies: Quality-based strategies focus on quality in all phases of an organization. There are certain dimensions of quality that must be focused on to make a success of this strategy. These dimensions are:

Quality and time based strategies are the two modern views of organization strategy.

- *Performance*: the main characteristics of the product or service
- *Special Features*: extra characteristics
- *Conformance*: how well a product or service corresponds to the customer's expectations
- *Reliability*: consistency of performance
- *Durability*: the useful life of the product or service
- *Perceived Quality*: indirect evaluation of quality
- *Service after Sale*: handling of complaints or checking on consumer satisfaction

The degree to which a product or a service successfully satisfies its intended purpose has four primary determinants:

- Design
- How well it conforms to the design
- Ease of use
- Service after delivery

It is important for management to recognize the different ways that the quality of a firm's output can affect the organization and to take these into account in developing and maintaining a quality assurance program. Some of the major ways that quality affects an organization are:

- Loss of business
- Liability of an organization
- Productivity
- Costs

Time-based Strategies focus on reducing the time needed to conduct the various activities in a process.

(B) Time-based Strategy: *Time-based Strategies* focus on reducing the time needed to conduct the various activities in a process. By reducing time, the costs are generally less, productivity is higher, quality tends to be higher, product innovations appear sooner, and customer service is improved. This can be achieved through,

- *Planning Time:* The time needed to react to a threat, to develop strategies, and select tactics, to adopt new technologies etc
- *Product/service design Time:* the time needed to develop and market new or redesign products or services
- *Processing Time:* the time needed to produce goods or provide services
- *Changeover Time:* the time needed to change from producing one type of product or service to another
- *Delivery Time:* the time needed to fill orders
- *Response Time for Complaints:* the time needed to respond to customer complaints about quality, timing of deliveries, etc.

Today in one industry after another, Japanese manufacturers are producing products two to three times faster than their Western competitors.

- In projection television, Japanese producers can develop a new television in one-third the time required by US manufacturers
- In autos, Japanese producers can develop new products in half the time and with half as many people as the US and German competition.

Activity: Do you think Bangladeshi operation managers need to consider the modern views of new strategy formulation issues? Why? Justify.

Operations Strategy for Services

Goods and services differ from each other in many ways. As a result the strategy for services should be formed keeping in mind the following strategic aspects:

- *Fewer barriers:* as services are often not patentable and the capital investment is low, competitors can easily join the market
- *Less proprietary technology involved:* it is more people –based than technology-based
- *Costs difficult to measure:* pricing is hard to compare among competitors as there is a lot of customer involvement
- *Acquisition is risky:* the acquisition is mostly of people who can leave any time they desire unlike that of machineries.
- *Location is important:* a good location is a key strategic move for a service-firm

- *More flexible:* as it is people-based and can vary according to the wishes of the customer.

Summary

Operations strategy is a collective pattern of coordinated decisions for the formulation, reformulation, and deployment of the organization's resources. These decisions provide a competitive advantage in support of the overall strategic initiatives of the firm or strategic business unit. Strategic planning is the process of thinking and considering through the current mission of the organization and the environmental factors it is facing and setting guidelines for tomorrow's decisions and results accordingly. Therefore, for the success of an organization the operation managers must make choices in the areas of facilities, capacity, choice of process, vertical integration, operations integration and operations interface with other functions.

Case Analysis

The cosmetic manufacturer

The top management of a cosmetic manufacturing company had formulated a mission to increase their market share significantly. It involved a five-year plan with an innovative product: stay-on lip gloss. The production department informed management that it would take at least one year to make a trial batch to release in the market. The Head of Finance was anxious about the huge capital input involved in buying the technology required. Five years after their product was in the market, but proved a failure. The demand for their product had not been what they had anticipated, and market share had not increased. Their main competitor had introduced a product that had diverted all attention from theirs, and their promotional endeavors had failed miserably. Due to the huge capital already invested, they were unable to stop production, and cut their losses.

Question:

1. What was the problem with top management's mission? How should they have formulated their strategy?

Case Analysis

Duke's Business Plan

As the business team sits at their round conference table, Rita brings up an issue now near to her heart. She has just become engaged to Duke, who works for Pepsi Co. Duke is worried about his new job. Coke's CEO Robert Goizueta has created more wealth for shareholders than any CEO in history with the single focused strategy of making Coke the domestic and international drink. On the other hand, Pepsi is a conglomerate with domestic and international drinks; restaurants such as Sonargaon, Sheraton, Sundarban, and Pizza Hut etc; Bottling operations. While Coke has been focused on selling Coke, Pepsi has diversified, pouring billions of dollars into other capital-intensive business. Some think Pepsi has lost the cola wars, both in Bangladesh and overseas. Duke wants the team's advise about what strategic help he can give his new boss.

Questions:

1. Taking the steps in the strategic process in order, what advice do you think the team should give Duke?
2. What factor do you think have led Pepsi to choose its strategy instead of Coke's strategy?
3. What strategic planning changes would you recommend to Pepsi and why?

Discussion questions

1. Describe how distinctive competencies relate to strategy formulation.
2. It has been said that a typical Japanese automobile producer is more efficient than its U.S. counterpart. What are the possible explanations, assuming that U.S workers are as hardworking as Japanese workers?
3. Explain and discuss the concept of positioning. Why would a company *not* want to keep changing to confuse its competition?
4. How might operations strategy of a local business respond to the imposition of import tariffs on foreign substitutes?
5. If you were to open a fast-food shop in a well-known shopping mall, how would you plan your operations strategy?
6. Do you think that a market based view of strategic planning is crucial to competitiveness? Why?

Lesson three: Productivity Quality Technology

Lesson Objectives

After completing this lesson you will be able to:

- Explain the relationship between productivity and operations management
- Justify the importance of production quality
- Discuss the use of technology in the production process

Productivity can be defined as the relationship between inputs and outputs of a production system.

Productivity

Efficiency, productivity, and performance are terms we tend to use interchangeably in discussing the behavior and achievement of production. Efficiency and productivity refer to a ratio of outputs to input. Productivity can be defined as the relationship between inputs and outputs of a production system. If more output is produced with the same inputs productivity is increased. Likewise, if same output takes fewer inputs productivity is also increased. Performance, on the other hand, is a broader term incorporating efficiency and productivity in overall achievement.

For a firm, productivity is very important for several reasons: as a firm's productivity improves, the firm's ability to compete in the market improves, leading to sustained economic growth. With increased productivity, less inputs are needed for a given amount of output, which minimizes the production cost or offsets the affects of inflation. This is possible because here we get more output from the same amount of input which is either for improved technology or decrease in waste age rate or as a result of an organization's strategy. Improving productivity is more important than any other setting in the firm or industry. The reasons behind this are:

- Productivity permits better salaries and wages and these in turn are the bases for a better standard of living.
- Improved productivity keeps the firm afloat and competitive in the market.
- Productive people are happy people. They are satisfied; they find their reward in their own effort.

Improving productivity is more important than any other setting in the firm or industry.

Changes in productivity are often calculated by comparing ratios of output per worker-hour utilized to produce the product or service or output per unit of labor and capital employed to produce the product or service. If only labor input is measured, a change in the ratio may be misleading because the change in productivity may have resulted from a change in the amount of equipment per worker rather than increased worker efficiency. Therefore the firms' productivity will be:

$$\Pr oductivity = \frac{Outputs}{Labor + Capital + Materials + Energy}$$

The term total factor productivity is used when the ratio is based on both capital and labor inputs. The term labor productivity is sometimes used if the ratio refers to labor hours as the only input. For example if a firm uses the inputs of 200 hour labor and 100 hours of machine and got output of 3,00,000 units, then the multifactor productivity of the firm will be:

$$\text{Multifactor Productivity} = \frac{3,00,000}{200hr + 100hr} = 1000 \text{ units per hour}$$

Quality

One reason that the competitive position of a firm can cost is it the quality of goods and services does not meet the customer's expectations. Quality, nowadays, is viewed as not only meeting customer satisfaction but rather exceeding it. From the customer's perspective an important part of the quality of a good or service is fitness for his or her intended use of it. A product must be adequate enough for the application that the customer has in mind. There is a clear relationship between quality and productivity. Generally, when quality increases, so will productivity. This is mainly because of the elimination of waste, which ultimately reduces the input.

A product must be adequate enough for the application that the customer has in mind.

Improving quality is one important way to maintain a competitive position in the market. Quality can be promoted to customers and employees. Consumers want quality products and services, and employees at all levels in the organization like to be associated with a winner. From an economic perspective, when quality is emphasized and subsequently improved, waste is decreased, materials are not thrown away, hours are not wasted reworking products and operations costs are reduced. At the same time, the customers receive products and services that are of their satisfaction. Moreover, prices can be lowered to share this productivity gain with customers, thereby stimulating an increase in the firm's market share. Therefore to achieve good quality, a company must address three major areas:

When quality is emphasized & improved, waste is decreased, materials are not thrown away, hours are not wasted reworking products and operations costs are reduced.

- *Quality of design*: The product or service must be designed to be of at least the minimum appropriate grade for its use,
- *Quality of conformance*: It should conform to the standards of the design, and
- *Quality of performance or service*: Consumers should receive the necessary training and service support so that their use of the product is satisfactory within reasonable expectations.

Companies compete for the consumers' business on several bases. The three most frequently recognized factors that influence a potential purchaser are: price, quality, and availability. When competing products are available, the customer mentally performs an evaluation of the *price quality trade-off*. He or she may not calculate an explicit cost benefit ratio, but the concept is very much the same. The basic question is that how much service do I get for my money? A company then has to provide a competitive level of quality at a competitive price in order to have the necessary sales revenue to pay its expenses and leave a profit. The costs that a company incurs because of quality activities or because of the lack of quality can be divided into four segments. These are,

- *Costs of prevention:* This cost relates to attempts to prevent defects from occurring. Costs for quality planning, process control, and quality training and work force development.
- *Cost of Appraisal:* This cost relates to inspection, testing and other activities intended to uncover defective products or services, or to assure

that there are no defectives. Inspection of purchased items, inspection, maintenance, and calibration of test and inspection equipment.

- *Cost of internal failure:* These are costs for failures that are discovered during the production process. Internal failure occurs for a variety of reasons, including defective material from vendors, incorrect machine settings, faulty equipment, incorrect methods, incorrect processing, carelessness and faulty or improper material handling procedures. The cost of internal failure includes scrap, rework, revenue lost when products must be sold as seconds etc.
- *Cost of external failure:* These are costs for failures that are discovered after delivery to the customers. External failure causes are defective products or poor service that go undetected by the producer. Resulting costs include warranty work, customer service, product liability, product recalls etc.

It is notable that among the above four segments the first two segments are the costs to control quality and the last two segments are the costs of failure to control quality.

Technology and Its Adaptation

Technology is an emerging factor of economic development.

Technology is the scientific expertise needed for the operations process, building of labor, land, capital and management. In a conversion process technology includes the sophisticated level of modified and scientific methods used in plant, equipment and skills. A soap manufacturing operation, for example, features a highly mechanized, capital intensive, efficient production process with specialized equipment. There is a growing assertion that economic growth is becoming dependent on technology. This leads to the need for continuous R&D (research and development) in technology management in order to manage increasingly complex technological innovations in an ever-challenging competitive global environment. Though the economists have long considered mostly two causes – capital & labor - for any economic development, they are coming around to acknowledging technology as the third major cause. It is because capital and labor are the two primary factors needed for all other factors of production, and technology is the accomplishing mean to amalgamate all these factors into production.

Therefore, the urgency and the significance of managing technological change to achieve sustainable development can hardly be overemphasized. As human societies have gradually evolved from the sole-dependence on *mother nature* to more and more reliance on man-made technology therefore, revolutionary technological change has become the norm of socio-economic development. However the capacity to conform to the technological change is not the most important quality for development. It rather includes these three capacities:

- Capacity to raise serious questions about the way organizational activities are done
- The assumptions upon which operations decisions are based; and above all
- The organization capacity to take risks

In an age when rapid change is the norm, the developing economies should be able to handle transition on a continuous basis. Moreover, since these changes are driven by technology, the ability to mange technological change depends on the use of appropriate measures of the organization and its management.

Misconception About Appropriate Technology in Developing Countries

Let us note here a commonly held misconception regarding technological appropriateness in developing countries. Since no technology is the *be-all end–all* for any situation, *appropriate technology* merely refers to the appropriateness of choices made for actual use. In fact, appropriateness is not to inherent any technology. Appropriateness is intrinsically objective, and situation and time specific. There is a feeling among some government officials that labor-intensive and less sophisticated machinery are always appropriate for developing countries. However with less skill (*humanware*[2]) and less sophisticated physical facilities (*technoware*[3]) global market competition is not possible. Therefore, simply equating appropriate technology with labor-intensive *technoware* may result in sub-optimization and lead to market failure for any growing firm or industry.

Appropriate technology merely refers to the appropriateness of choices made for actual use.

Misplaced Reliance on Technology Transfer

Another interesting point made here for those who advocate the sole reliance on *technology transfer* by developing countries is that technology is a human-made resource and it is mostly owned by the private enterprises of the developed countries. But most important by technology transfer is a business deal between the producer (or supplier) and the user (or buyer). Now let us observe the pattern of technology flow in the free world under normal circumstances. Businessmen know that only non-state-of–the art[4] technoware are sold in the international market at prices determined by the relative bargaining power. Critical info-ware[5] (sometimes known as trade secrets) is closely guarded by the owner of bargaining power. And orgaware[6] cannot be transplanted without socio-cultural adaptation. Therefore, technology transfer is not just "know-how licensing" and certainly not an automatic byproduct of foreign investment. Technology transfer can be called successful if the buyer can use the technology to compete in the global market.

Technology transfer is not just know-how licensing transfer. It will be successful if the buyer can use the technology to compete in the global market.

Reverse Technology Life Cycle in Developing Economies

By necessity, enterprises in late developing economies may follow the reverse order of the *technology life cycle*, i.e., slowly progressing from the end to the beginning on the basis of a progressive set of strategies. Some of the strategies are,

- *Technology extender strategy:* Use of out dated and imported, but mature technologies by small-scale start-up firms.
- *Technology exploiter strategy:* Selective use of modern, standard technologies by medium size joint venture firms.
- *Technology follower strategy:* Adaptation and use of licensed technology and creative imitation by large firms.

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[2] Humanware or know-how technology consists of the skills needed to realize the potential of technoware.

[3] Technoware or physical technology refers to both material processing subsystem and information processing subsystem that may be built into the physical technology.

[4] meaning only those which does not threaten the competitive edge of the seller

[5] Inforware or know-why technology represents the accumulated knowledge needed to realize the full potential of the technoware, humanware and orgaware.

[6] Orgaware or procedural technology refers to the support net of principles, practices and arrangements that govern the effective use of technoware by the humanware - which may be viewed in terms of work convention, organization, work facilitation, work evaluation and work modification.

- *Technology leader strategy:* Use of own state-of–the-art technologies for global market competition by high technology firms.

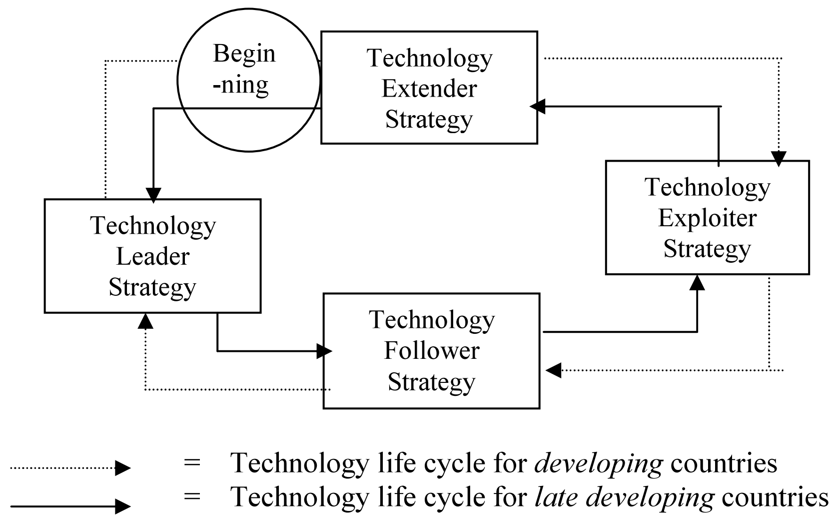

Figure 2.2.3: Technology life cycle

It is important to note that while acquiring new types of technological capabilities in successive stages, all existing capabilities have to be further strengthened through component upgrading and continuous learning. The Figure 2.2.3 shows the close interaction between developing and late developing economies.

Summary

Technology is the scientific expertise needed for operation process building of labor, land, capital and management. In a conversion process technology includes the sophisticated level of modified and scientific methods used in plant, equipment and skills. Productivity can be defined as the relationship between inputs and outputs of a production system. If more output is produced with the same inputs productivity is increased. Likewise, if same output takes less input productivity is also increased. Quality is the customer's perceptions of degree of excellence exhibited by product services. It makes the customers satisfaction high and the product consist. Three major aspects of quality can be summarized as, quality of design, quality of conformance, and quality of performance or service.

Tipon TV in Bangladesh

Tipon TV has been manufacturing television sets for the last twenty years in Bangladesh. At one point it was the market leader among the local manufacturers, and Tipon TVs were reputed to be durable, and their performance met the expected standards. However, today their TVs are outdated in terms of design and features offered. Productivity has not increased with time, and the technology used is outdated and labor-intensive which means a large number of low-skilled workers are employed. Their machinery was imported from abroad, and for many years now overhauling has been delayed as profits have dropped and funds are short. Buying new capital-intensive technology was considered but the idea was dropped because the cost involved was enormous. With the advent of the free market economy, foreign televisions that offer better quality and competitive prices, demand has been dropping faster.

Case Analysis

The board of directors of the company has hired a new managing director to bring in new ideas and innovations as a last-ditch attempt to rescue the sinking ship. She recommended to the board that a loan be used to finance the purchase of newer, capital-intensive technology, revamp the design and features of the television set. This would have a two-fold effect, resulting in both improved quality and productivity. As this involved redundancy of a large section of the workers, some of the directors had qualms about that. When the objection that the unskilled labor force would not be able to work with new, sophisticated technology was raised, the MD's solution was to provide training to some workers to enable operating the new equipment.

Question:

1. Do you think the new MD's proposal is a viable one or not, keeping in mind the Bangladesh context? Justify your answer.

Case: Haji's Biriani

HAJI's BIRIANI, a house of quality fined rice mixed with beef, wants to extend its service and is considering broadening its menu to offer Kabab (roasted meat) and Shahi Halim (a kind of porridge made with beans, meat, etc) in addition to its only special menu Biriani. It has been running its business by selling Biriani for a long time, and it has got enough name and fame and superiority over other in this sector. Though it has a great demand everyday. It does not cook Biriani more then two haris (Large rounded vessel used for cooking) per day only to maintain its quality and taste. Haji thinks that the new menus will not be made in large volume, as is its standard item, and the owner, Haji is therefore evaluating whether or not the new menus will be introduced while there exist a number of quality restaurants and Kabab house offering them.

Case Analysis

He is also evaluating decisions regarding whether or not the new menus will be prepared and served ahead of time. If he chooses not to prepare Kabab and Halim ahead of demand, it will move away from the dependability –service characteristic for these items. If these items are prepared ahead and held, these might not appear so fresh and be so tasty. This option would cause the company to move away from a high – quality emphasis. If the items are prepared at some rate of reasonable expected demand and thrown away if not demanded Haji's cost performance will suffer. On the other hand, concentration on the new items may demise his existing quality and demand of Biriani.

Questions:

1. Visualize yourself in the position of Haji. Now how will you manage the operations features to remain consistent with its position?
2. Do you thing that you should apply high technological support for his operations? If yes, then do you think that it can affect his quality of products? Why? (Given that existing operations are performed manually)
3. As a manager of Haji, do you support this diversification? Justify your answer.

Discussion questions

1. What are the primary reasons for high productivity?
2. If the firm accepts quality as a strategic variable for improving operations, what result might the firm expect?
3. Relate quality and productivity.
4. How should the operations strategy of companies in developing nations use technology as a competency?
5. What is unusual about the technology life cycle in developing economies?
6. "In fact, appropriateness is not inherent to any technology." Do you agree? Justify.