**Chapter-9 Control and Quality Management**

**Concept of Control**

Controlling is the process of measuring and comparing actual performance achieved with that of planned performance and taking corrective step if any deviation is found between actual and planned performance.

In other words, controlling is the function of management, which measures consistency between actual achievement and pre-determined goals.

" Controlling is determining what is being accomplished, that is, evaluating performance and if necessary, applying corrective measures so that performance takes place according to plans." **-George R. Terry**

***Characteristics of Control***

1. **Management function:** Controlling is important function of management. It is the controlling function that brings about a balance between planned and actual performance. Without controlling, other functions of management becomes worthless.
2. **Pervasive function:** Controlling is pervasive function in all levels of management from top level to the first line. However, the degree of control depends upon the nature of management and level of responsibility and authority. Generally, the chief executive controls departmental managers, departmental managers control supervisors, supervisors control the operating level employees.
3. **Continuous process:** Controlling is a never ending process and lasts till the organization is in existence. It involves a continuous analysis and study of implementation of standards, policies and procedures of the organization.
4. **Dynamic process:** The standards of operation of an organization will be reviewed on the basis of the changing environment of the business. The procedures and system of control must be changed to adapt with the changing standards of operation. The manager has to introduce new techniques and strategies so that he is able to control the performance in a systematic way.
5. **Forward looking:** Controlling is not concentrated on the past and present performance only; it also focuses on future performance. The early detection of weakness and errors in work contributes in taking corrective action in time. This leads to effectiveness in future performance and will prevent such repetition of defaults in the future.
6. **Measurement and comparison:** Controlling is the managerial tool which compares actual performance achieved with planned performance. Frequently, the authority concerned measures actual performance with planned performance and it takes necessary steps of correction if there is any deviation.
7. **Corrective action:** Controlling is the management function through which a manager takes necessary steps if actual work done is not in accordance with a plan. Tactful action at the right time is the essence of controlling.

***Process of Control***

Managers need to study various factors before taking any action. It is necessary to consider some process for taking the right decision. The following are the major steps in the process of controlling.

**PROCESS OF CONTROL**

1. **Establishment of standard:** The process of controlling starts with the establishment of a standard of performance. The standard of performance must be practically attainable and should be the basis of comparison with actual performance. The standard of performance may either be tangible or intangible. Tangible standards can be expressed in numerical terms. Again, tangible standard may be classified as: quantitative standard, monetary standard, time standard and financial standard. Intangible standards involve competency of managers, employees' morale, reputation of enterprise, good public relation and so on. Therefore, managers need to set both quantitative and qualitative standard of performance of the organization.
2. **Measurement of actual performance:** The second step in the controlling process is the measurement of actual performance achieved with that of planned performance. The measurement of actual performance must be done in accordance with the standard laid down. It makes measurement easier and meaningful. Therefore, there must be a provision of measurement from time to time even when the actual performance is still in operation.
3. **Comparison of actual performance:** This step of controlling process focuses on the detailed study actual performance and comparison against standard performance. Such comparison shows the range of deviation of actual performance achieved from that of the standard defined. If the range of deviation between actual and standard deviation, it can be ignored. However, if the range of negative deviation is more than the standard, it is essential note such steps deviation for necessary steps. Hence, comparison of actual performance is helpful to identify weaknesses and strengths in any part of performance.
4. **Analyze the cause of deviation:** A detailed study of each and every part of performance guides in finding out the cause of deviation in actual performance. The causes of deviation of actual performance gained against the standard defined might be due to external environment, internal environment, defects in planning, organizational defects, and others. Therefore, it is essential to detect where the problem lies so that corrective action can be taken in the right time.
5. **Taking remedial action:** The final step of controlling process is to take corrective action so that actual performance come to the level of standard performance. The management must have a strategy to remove limitation in internal environment through modification and to adjust itself with the external environment. Generally, remedial action might involve modification and improvement in planning, betterment of internal environment, organizational structuring, placement of right person to the right job, the betterment in directing techniques.

**Types of Control System**

**Output**

**Processes**

**Corrects problems after they occur**

**Anticipates Problems**

**Corrects problems as they happen**

**Post Control**

**Pre Control**

**Concurrent Control**

**Input**

1. **Pre-control:** The pre-control is also known as **feed-forward** or **preventive** **control**. It is specified at the time of formulation of planning. It is future directed control. It allows management to prevent problems rather than solving them occurs. It predicts problems that the management may face in future and identifies the steps to be taken to resolve them. It also tries to anticipate deviation in advance and allows corrective action to be taken before the problem arises. Organizational plans such as strategies, policies, and procedures are pre-control devices.
2. **Concurrent control:** Concurrent control is also known as **real time** or **steering control** as the technique of controlling activates in the process of functioning. In this system, supervisors direct the work of subordinates so that they perform their work properly. In this process of functioning, if any problem takes place, it is identified and analyzed and corrective measures are taken before any major damage occurs. It is a continuous process and necessary adjustments that are made in activities to meet the desired standard. Examples of concurrent control are quality control chart in an industry, inventory control, production control, etc.
3. **Post control:** Post control is also known as **post-action control** or **feedback control**. It takes place after the activity is over. Management, under which, can take corrective action after analyzing deviation from the planned results. In other words, it is the process of adjusting future action on the basis of information about past performance. Post control technique in fact provides corrective feedback which facilitates the management to take necessary steps to improve future performance. For example: When a sales goal is set, the sales team works to reach the goal for three months and at the end of three month managers review the results and determine whether sales goals was achieved.

***Characteristics of an Effective Control System***

Controlling system is necessary in all types of organization. But a good control system should ensure achievement of every objective of the organization. Some of the major feature of a good controlling system are as follows:

1. **Suitability:** A better control system should be appropriate according to the needs of the organization. It must be adjustable according to the nature, type, size and requirement of the organization. Similarly, control system of a manufacturing concern may vary from the control system of a trading house, service and so on.
2. **Simplicity:** Controlling system must be simply so that it is easy to understand and operate. The management has to introduce a simple controlling so that every levels of authority can understand and operate it easily. The new scientific type of controlling, if possible, should be introduced in clear and understandable way.
3. **Objectivity:** A good control must meet the objectives of the organization. Every organization is established for specific goals and for this, standards of performance are determined. Therefore, a controlling system should be ensured that actual performance must be in accordance with the standard defined. The concept of personal likes and dislikes should not be taken into consideration.
4. **Economical:** A controlling system must be within the financial capability of the organization. It must be economical in design and in the implementation process. Therefore, controlling system must consider the cost benefit concept. It means, the output of controlling must be more that its input.
5. **Comprehensive:** A good controlling system must cover all the key functional areas of the organization. It must be comprehensive in design and functioning. More concentration should be given on those functional areas where controlling is essential.
6. **Capable to communicate:** A better control system must be capable to communicate with the concerned authority. In other words, communication system must be clear, effective and scientific. It needs not only the mere flow of information from top level to the subordinates but the flow of information must be in the right time.
7. **Suggestive:** A good control system must be suggestive in its motive. It involves the measurement of actual performance with that of planned performance and finds out the deviation. Therefore, the controlling system must commence from the measurement of actual performance against planned performance to suggest remedial action.
8. **Flexibility:** A good control must be flexible. This is a must to adjust with the changing environment. The controlling system of today may not be effective for tomorrow as objectives, plans, activities, people, external, conditions, etc. changeover time.it needs to be amended according to the time and the situation.
9. **Forward looking:** The control system should be directed towards the future. If controls details do not relate to future, they are of no use as they will not be able to suggest the measures to be taken to avoid recurrence of variations in the future.

***Potential Barriers to Successful Controlling***

Effective control system is essential to maintain a balance between the standard set and actual performance achieved. Many problems may arise in the course of functioning. The following are the potential barriers to successful controlling:

1. **Over control:** Unnecessary pressure on employees' s behavior and their functions may create problems in effective control. Problems arise when employees perceive that the management attempts to limit their freedom unnecessarily. This can increase employees' frustration and thereby reduce their morale.
2. **Inappropriate focus:** Focus on a certain aspect while taking decisions may create problems in effective control. For example, unnecessary focus on increasing sales volume to maximize profit without considering quality of product or services may decrease goodwill in the long run. Employees oppose such narrow focus.
3. **Reward for inefficiency:** Employees should be rewarded on the basis of their efficiency and skill. Rewarding employees without considering their efficiency creates problems in control. If more incentive is given to an inefficient employee as compare to an efficient employee, it creates frustration among the efficient employees.
4. **Maximum accountability:** When an employee or group of employees complete their given job and report to the concerned authority, it is said that they have fulfilled their accountability. But without setting standards and delegating authority, if more responsibility is given to an employee, it may create problems on work effectiveness.
5. **Coordination problem:** In an organization, many departments are formed on the basis of nature of works. Each department is independent to perform its activities. However, works of one department is inter-related to the works of other departments. If interdependent departments perform their functions without considering the functions of other departments, it is more difficult to maintain coordination.
6. **Imbalance in authority and responsibility:** Authority is related to power that is inherent in managerial positions whereas responsibility is the obligation t be fulfilled by subordinates. If there is lack of balance between authority and responsibly it is more difficult to implement the control in an effective way. When subordinates have given more authority than responsibility, there is possibility of misuse of authority. Similarly, when subordinates have more responsibility than authority they cannot accomplish assigned job effectively.
7. **Ineffective communication:** Effective communication ensures smooth functioning in the organization. It is essential to develop a formal system of communication to pass information within and outside the organization. However, if managers are unable to minimize communication barriers, it becomes difficult to maintain effective control over the activities of subordinates.

***Quality Control System***

**Concept of Quality**

Quality is the perception of excellence viewed by customers to satisfy their needs. It is a sense of appreciation that a product or service is better than others.

" Quality is the degree of excellence at an acceptable price and the control of variability at an acceptable cost." - **Robert A Broh**

" Quality is the totality of features and characteristics of a product or service that bear on its ability to satisfy stated or implied needs."

**- American Society for Quality Control**

In conclusion, quality is the excellence of the products in terms of its performance, reliability, durability, serviceability, and so on.

***Factors Affecting Quality***

Quality is the level of excellence viewed by customers to satisfy their needs. The greater the perceived value of product or service, the higher is customer expectations for quality. The effective management of quality depends upon a number of factors consisting of:

1. **Policy:** The top management establishes policies regarding product quality. These policies specify the level of quality to be achieved in a product or service. Managers generally consider three factors in determining policy for quality. The product and services market, its competition and image. Quality levels in competitive market also affect policy because the company's product must have the quality to succeed in the market. Production of inferior quality product may spoil long term interests of the organization.
2. **Information:** The top management must acquire the right information about customer needs and expectation and the competitors' s quality standards. Nowadays, advanced computer technology is facilitating organizations to quickly obtain and evaluate information about the quality of products.
3. **Engineering and design:** Product engineering and design ensures new products in less time with better quality at lower cost. The production department has to produce a product at a reasonable cost with better quality. It is the engineer or designer who must translate the policy into actual product or service. Innovation and creativity helps to design a product having superior quality. The basic purpose of designing is to avoid defective production.
4. **Materials:** The top management must realize that quality product can be produced only by using good quality raw materials. They need to terminate contract with lower quality vendors and maintain long term relationships with better ones.
5. **Equipment:** The use of automatic machines, computer software and robotics makes the output uniform and qualitative. Machines, equipment and tools used in the production process should be advanced and automatic.
6. **People:** Employees are very important components for maintaining and improving quality. Well experienced and dedicated employees can contribute more to improve quality. Functioning independently, or in a group, they can improve the quality of a product and service. Therefore, the management has to guide employees on total approach of quality.

***Total Quality Management (TQM)***

Total quality management is a management strategy that is designed to bring awareness of quality in all organizational processes. Total quality management consisting of quality of return to satisfy some specific needs of shareholders, quality of products and services to satisfy some specific needs of the employees in the organization.

TQM ensures that things that are done rightly for the first time, and defects and waste are eliminated from operations. An organization that adopts TQM must implement changes in all areas of management.

TQM has four objectives:

* **Better, less variable quality of product or service.**
* **Quicker less variable response in process to customer needs.**
* **Greater flexibility in adjusting to customers shifting requirements.**
* **Lower cost through quality improvement and elimination of non-value adding work.**

***Tools for TQM***

Organizations can apply several tools and techniques to improve quality. The popular among them are benchmarking, outsourcing, speed. ISO 9000 and statistical quality control techniques.

1. **Benchmarking:** Benchmarking is an evaluation and comparison of own products and process against the very best in the market. Benchmarking involves looking similar firms to examine how they have achieved the best performance levels and to understand the process they use. Application of benchmarking involves four steps.

* Understand in detail the existing business practice.
* Analyzing the business process of others.
* Compare own business performance with that of others analyzed.
* Implementing the steps necessary to close the performance gap.

1. **Outsourcing:** Outsourcing is the process of providing some parts of jobs to other organizations to bring quality and cost benefit. If an organization performs each and every activity by itself, they may not be able to perform it in an efficient manner and the quality of products and service will also be inferior. Therefore, the organization needs to identify certain areas that can be outsourced to minimize the cost of operation and to produce higher quality.
2. **Speed:** Speed is the time required to perform specific activity for an organization. It is required in every area including development, production and distribution of products or services. Many organizations are using speed for competitive advantage today. Increasing speed will give organizations a strategic advantage and helps them to complete the task more effectively. It involves not only doing the same thing faster but also rethinking and redesigning the whole business cycle.
3. **ISO 9000:** ISO 9000 is the international standard set for the product and service by the international body. It was founded on 23 February 1947. Its headquarters is in Geneva, Switzerland. There are five sets of standards covering areas such as product testing, employee training, record keeping, supplier relations and repair policies and procedures starting 9000 to 9004. Firms that meet these standards apply for certification and are audited by a firm's domestic affiliate organization. **Nepal Bureau of Standards and Metrology** **adopts this standard in Nepal**. This office reviews every aspect of the firm's business operation in relation to standards and grant ISO 9000 certificate who meet the standards.
4. **Statistical Quality Control (SQC):** Statistical quality control is asset of specific statistical techniques which is applied to monitor the quality of goods or services. It is based on statistical and probability theories. It seeks to control the quality through incoming materials, processing and outputs produced. Control charts are constructed to set the acceptable lower and upper limits of an aspect that we want to control in an item. All finished products may not be exactly the same and therefore, some limits or tolerance must be set so that if the finished product falls within these set limits, it can be considered of acceptable quality.
5. **Just-In-Time(JIT) Inventory Management**: This is the inventory system control method. Under it, inventories are received just-in-time to be used up by production.
6. **Right the First Time** : Under this, employees ensure quality while they work. They do the right things first time. The result is zero defects. Do it right the first time approach focuses on designing and building quality into the product. This approach is much less costly than fixing or throwing away substandard parts and finished products.

***Deming Management***

Deming management is the application of the principles of W. Edwards Deming an American scholar, in management. According to **Deming**, management is the creation and continuous improvement of organizational systems. The implementation of such creative and improved management system leads to increase in value in the management system in its products and services. Continuous improvement is essential in the management system in this internationally competitive world characterized by rapidly changing technology and customer demand for higher levels of the values. Deming believes that the manager's job is to seek out and correct the causes of failure, rather than merely identify failures after they occur.

**Principles of Deming Management**

**Robert Kreitner** has suggested the following four principles of Deming's quality management:

1. **Quality improvement drives the entire economy:** quality improvement is essential to reduce waste and inefficiency. It helps to increase higher productivity, greater market shares and new business and employment opportunities.
2. **The customer always comes first:** Satisfied customer is essential for organizational success. As such, an organization must produce goods and services on the basis of customers' needs and expectations.
3. **Do not blame the person, fix the system:** Deming disagreed on blaming a particular person or department for inferior quality. Management, work, rules, technology, organizational structure and culture, all are responsible for inferior quality. Employees will produce superior quality if the system is redesigned to improve it.
4. **Plan- Do- Check- Act:** He suggested a four step process for the application of TQM which is popularly known as **PDCA** cycle. **Plan** is ahead for change which involve analyze and predict result. **Do** involve execution of plan as pilot project. **Check** involves the study of result of pilot project. **Act** is concerned with implementation of plan for improving products or services.

***Deming's Quality Management Techniques***

The following are the fourteen techniques suggested by Deming to maintain total quality management:

1. **Create constancy of purpose:** The management must make all efforts of constant improvements in products and services to remain competitive in the market. Quality and not profit should be the organization's purpose. According to Deming, profit is automatically had when the organization is able to maintain quality.
2. **Adopt the new philosophy:** According to Deming, modern method and advanced technology should be applied to improve product and service quality. All organizational members should support new culture and dedicate themselves to improving quality.
3. **Cease dependence on mass inspection:** Quality can be maintained by improving the process and not by inspecting. Inspection on faulty products is unnecessary if quality is maintained from the very beginning. According to Deming, once errors occur, efficiency and effectiveness are already lost.
4. **End the practice of awarding business on price tag alone:** Purchasing department normally gives orders to the lowest price vendors. But they do not ensure quality materials and supplies. Therefore, it is essential to maintain long term loyal and trusting relationship with a single supplier who deals with quality.
5. **Seek continuous improvement:** Management must continuously improve the production process for better productivity and lower cost. In other words, it is the responsibility of the management to innovate alternatives to reduce waste and to improve quality.
6. **Institute modern methods of training on the job:** Generally, junior workers learn their job from seniors who were never trained formally. It may not develop the new scientific knowledge and skills among them. On the other hand, on-the-job training helps them to increase the required knowledge and skills to complete a given job.
7. **Institute leadership:** The responsibility of managers and supervisors is to help workers to reach their full potentiality. They need to adopt and institute leadership to help workers to do a better job. Management must ensure that immediate action is taken on reports of inherent defects, poor tools, unclear operational definition.
8. **Drive out fear:** The feeling of fear of employees to express their views, opinions, and ideas must be avoided. For this, the management needs to encourage effective two-way communication.
9. **Break down barriers between staff areas:** The management must break down barriers between departments and staff areas. The practice of team work and group efforts must be encouraged. Employees can improve productivity by learning from one another and coordinating efforts regardless of their functional expertise.
10. **Eliminate slogans and targets:** Deming suggested that signs, slogans and targets to motivate and inspire employees must be eliminated. It is necessary to focus on continuous improvement on quality. Effective leadership and continuous improvement of the system helps to meet the target.
11. **Eliminate numerical quotas**: Deming advocates that only focus on numerical quotas may diminish the quality. Manager should focus on quality instead of blindly pursuing numbers.
12. **Remove barriers to pride of workmanship:** The management should support the employees to overcome the obstacles that may arise in course of functioning. It is necessary to improve continuously the management system, inadequate instruction, faulty equipments and defective materials.
13. **Institute a vigorous program of education and training:** According to Deming, both management and workers must be educated and trained in the new methods to improve quality. Introducing a teamwork culture and the philosophy of TQM is helpful to improve quality.
14. **Take action to accomplish the transformation:** According to Deming, all organizational members must understand these 14 points and work together to reach quality goals. The management must develop strategic plans in order to achieve the highest level of quality. Neither the worker nor the management alone can improve the quality.

***Quality Improvement Process***

Edward Deming, who developed total quality management, has recommended four steps for improving quality of products and services. **These four steps involve Plan, Do, Check, and Action (PDCA). Sometimes it is also known as by Plan, Do, Study and Action (PDSA).**

1. **Plan:** At the beginning stage, managers need to identify and understand their problems or the opportunity that they can take advantages. For this purpose, they need to explore information for generating and screening ideas which is essential for developing rational plan. Plan should be formulated by focusing objectives. Customers' needs and expectations are the primary consideration for formulation of planning for quality improvement.
2. **Do:** Once managers have identified a potential solution of problem it is essential to test it with scale as pilot project. The pilot project test program can be organized in a geographical area or with a particular demographic. This will support the managers to assess whether their proposed changes achieve the desired outcome. If any problem is identified in pilot project phase, necessary steps must be taken to solve the problem in the do phase.
3. **Check (Study):** In this step, managers analyze result of their pilot project against the expectations that ids defined in plan. It facilitates to assess whether the idea has become effective or not. If the pilot project idea is become success, the managers can think for implementation. If it becomes failure, managers need to work again from plan and do. It is helpful in finding out the cause of deviations and evaluating their impact on the final product and market share.
4. **Act:** This is implementation part of quality improving. This is where managers implement their solution as far possible in effectively. It focuses on taking proper action to maintain standard and to improve process. This step deals with market research and aims to prevent problems rather than correct them.

Managers need to focus on continuous improvement pf quality of product and service to meet the changing expectation of customers. Therefore, PDCA/PDSA is taken as continuous task as moving circle. It is not only a process with a beginning and an end. Deming's PDCA cycle aims at developing teamwork with respect to product development, manufacturing, sales and market research for betterment of organization and customers.

**The following are the steps of the quality improvement process**:

1. **Choose an area of improvement:** At this first step, an area of improvement is chosen, which often is called the improvement "theme". Either management or an improvement team may choose following area or theme for quality improvement:

* Reduction of production cycle time.
* Increase in the percentage of non- defective units produced.
* Increase in on-time delivers.
* Reduction in employee absenteeism.

1. **Organize a quality improvement team:** At this step, quality improvement team is organized. This team may include following types of members.

* One or more associates directly responsible for the work being done.
* One or more customers receiving the benefits of the work.
* One or more suppliers providing input into the work.
* A member of management.
* Perhaps one or more experts in areas particularly relevant to solving the problem and making the improvement.

1. **Identify "Benchmarks":** At this step, quality improvement team identifies benchmarks (i.e. the best performance). The team compares with best performers and identifies how much improvement is required to match the best performance, for example, a pizza company may discover in this step that the benchmark (i.e., the fastest average time between the moment an order is taken until the moment of front-door delivery) established by a competitor is 20 minutes. Suppose the company's current average delivery performance is 35 minutes. That leaves a minimum possible improvement pf 15 minutes on the average.
2. **Perform analysis of current performance:** At this step, the team performs an analysis to find out how current performance can be improved to meet, or beat, the benchmark. It can current performance can be improved to meet, or beat, the benchmark. It can analyze the factors such as potential problems related to equipment, materials, work methods or people etc.
3. **Perform pilot study:** The team performs a pilot study to test the selected remedies to the problem. It tries to find out the area for further improvement such as customer service, company's overall sales capacity, new delivery, system standard, etc.
4. **Management implements the improvements:** Finally, the management implements the improvements. Such incremental improvements can greatly enhance a company's competitiveness. The key, therefore, is to continually improve both product and process.