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INSTITUTE OF MGT. & TECH.

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NOTES

CLASS:- MBA 3RD SEM

SUBJECT: TOTAL QUALITY MANAGEMENT

Quality of a product includes a peculiar and essential character(feature). Character applies to a peculiar and distinguishing quality of a thing or class.

\Webster’s dictionary explains the term Quality in this way. Quality is an inherent feature and property. Property implies a characteristic that belongs to a thing, essential nature and may be used to describe a type, carry a cert_ain degree of excellence.

Quality of a product is decided by the customer's needs, conforming to specifications, assured performance and safety, proper packaging, and timely delivery, efficient technical service and incorporating customer feedback.

Quality Guru J.M. Juran defines quality as **'fitness for purpose'.** Another quality Guru Philip Crosby defines quality as **'Conformance to specification'.** Forassessing the term 'Fitness for purpose' regarding quality is a highly subjective term, the interpretation of which may vary from individual to individual. The interpretation of quality of product or service from the point of view of customer may be different from that of the producer. The problem of the manufacturer or producer increases manifolds by the fact that the numbers of customers are too large and they have different perception of quality. If a third party such as quality certification agency has to decide about the quality of product or service, its perception may be different from those of customers as well as from producers.

The other criteria of "Fitness for purpose" is perfectly suitable at only one stage of production of a product or service. This is the stage of designing the product or service. The marketing department of the company prepares a product definition document, which includes the expectations and requirements of the customer from the product. This document with expectations and requirements are passed to the design department, where the design of the product are prepared keeping in mind the "Fitness for purpose", that is requirement of the customer. In all the subsequent stages such as development, engineering, production, distribution and after sales service, quality is measured in terms of **'Conformance to specifications.'**

History of Quality

1'h cone pt. of Quality is not now. Quality has been un integral part of human activity over since tho omicrons of human history. Proof of specification nod in action can ho found in the Bible eluting buck 500 BC. Also the given historical dents stand ns testimony how the criteria of quality entered in the wren of production.

1110 :	Craftsman trained upprcmtices to ensure the quality and standard of work-workmanship.
1765 :	During the Industrial Revolution, process of manufacture was broken into small jobs. The craftsman became inspectors and standard emerged.
1876:	Quality Measurement and Inspection techniques in every department.
1890:	F.W. Taylor's Scientific techniques and Operator Inspection.
1920 :	Industries realised the need of use of inspectors to ensure the quality of finished products leaving the factory quality controJ.
1924:	A statistical approach to assist quality control.
1930 :'	Process control, reliability.
1940:	Concept of 100% Inspection introduced.
1951 :	Deming Awards by Japanese Union of Scientists and Engineers.
1952:	Cause and Effect diagram was introduced by K.Ishikawa, Japan.
1960:	Statistical Sampling Inspection.
1962:	Zero defect concept was introduced.
1987:	International Quality Standards was introduced. ISO 9000 Quality management standard.
1992 :	European Quality Award.
1994:	CII (India) Award.

India's Position in Quality Competitive World

Total Quality Management (TQM) is a quality philosophy evolved by quality gurus such as Deming, Juran, Crosby, Feigenbaum, Ishikawa. Using the TQM principles propounded by these gurus, Japanese ,Companies became World leaders in quality products. Six sigma is the quality philosophy to ensure a reduction of number of defective products, ideally to zero. The herculean task can be achieved _ptily when each and every employee in the organization has the ability to measure and control quality in his domain of activity. Thus Six sigma involves rigorous training of all the employees in the various techniques of quality control. Quality certification bodies such as ISO conduct quality audits of the quality system before certifying an organization.

Profo ·or Rob ,rt . Knplon or Hnrva[rd] U • rsity recently made an ive l'ty driven and must sen at.ion that Indian firms need lo move from bemg.qu;hi global competitive P iti n th ms lvos us strategy focussed to compete in e w rld

lndtn 1s on the same Journey to qunhty h1rn apa h' Washio ' has world wnr. Tho renowned 'I'QM exper[t], p ro fe ssor Yasut os k i that of J a·pan pr diet d that tho quality of Indian Manufacturmg willover. e . b in 2013. Mnny Indian companies have got t eh P res tigwu[8] Deming pnzes h ecause t f their quality excellence in manufacturing. The Chinese cor panies a e [: not ntered the Deming circle, though the Chinese products hke _toys,e c ncl eqm·pments, shoes, dai·ly use pr ducts, bi·kes[h] av_e roe[ked th]it e internabona murk.et. They are low and cheap m cost but poor 1n the qual Y·

Indian companies are favourite in the list of Deming Awards ofJ_apan. The prestigious quality award was started in 1951 by the Japanese. Unrnn of Scientists and Engineers (JUSE), when Dr. Deming donated the earnin_gs from the sale of his papers (th : stenographic records of his. speeches compiled by JUSE) to JUSE. Initiall:y it was only for Japanese Companies, but it was thrown open to the world in 985.

There are three categories of this prize-

1. Presented to companies or division of companies that have enhanced performance through total quality management (TQM) in a given yea.r.
2. Deming Prizes for Individuals that is TQM scholars and Practitioners.
3. Quality Control Award for operations. Business Units given out for exceptional implementation of TQM.

Deming Quality Award is also considered as the Noble Prize in the World of Manufacturing. Many Indian Companies have got this award that include Rane Brake Linings, Brake India (Foundry division), Mahindra and Mahindra (Farm equipment and Tractors) Sona Koyo steering System, and Grasim Industries etc. Mahindra Tractors Unit is the first tractor unit in the world to win the Deming Award.

India is now seen as a quality manufacturer: The quality movement among the domestic auto-ancilliaries, actually was initiated by the country's premier car manufacturer, Maruti Udyog, through it cluster approach. Maruti got eleven of its vendors to adhere to quality system and processes. Many of these ancilliaries have won the Deming prize. Brake India's Foundry division is a cluster member of Maruti Udyog:

Infosys, Wipro, Satya_m, I-flex, TCS all leading Indian Software companies are in the forefront of quality band wagon. SEI-CMM level 5 has been considered at the threshold in attaining the peak of quality. In the year 2001, India has 32 companies at SEI-CMM level 5 assessment, while only 58 organizations across the World have acquired such assessment.

'I'hus th Indion companies nrc gaining momentum to achieve excellence in the_field of qunlity nnd cnn become n major force in the year 2013; Jeaving wny b lhinrl the Japanese counterpart.

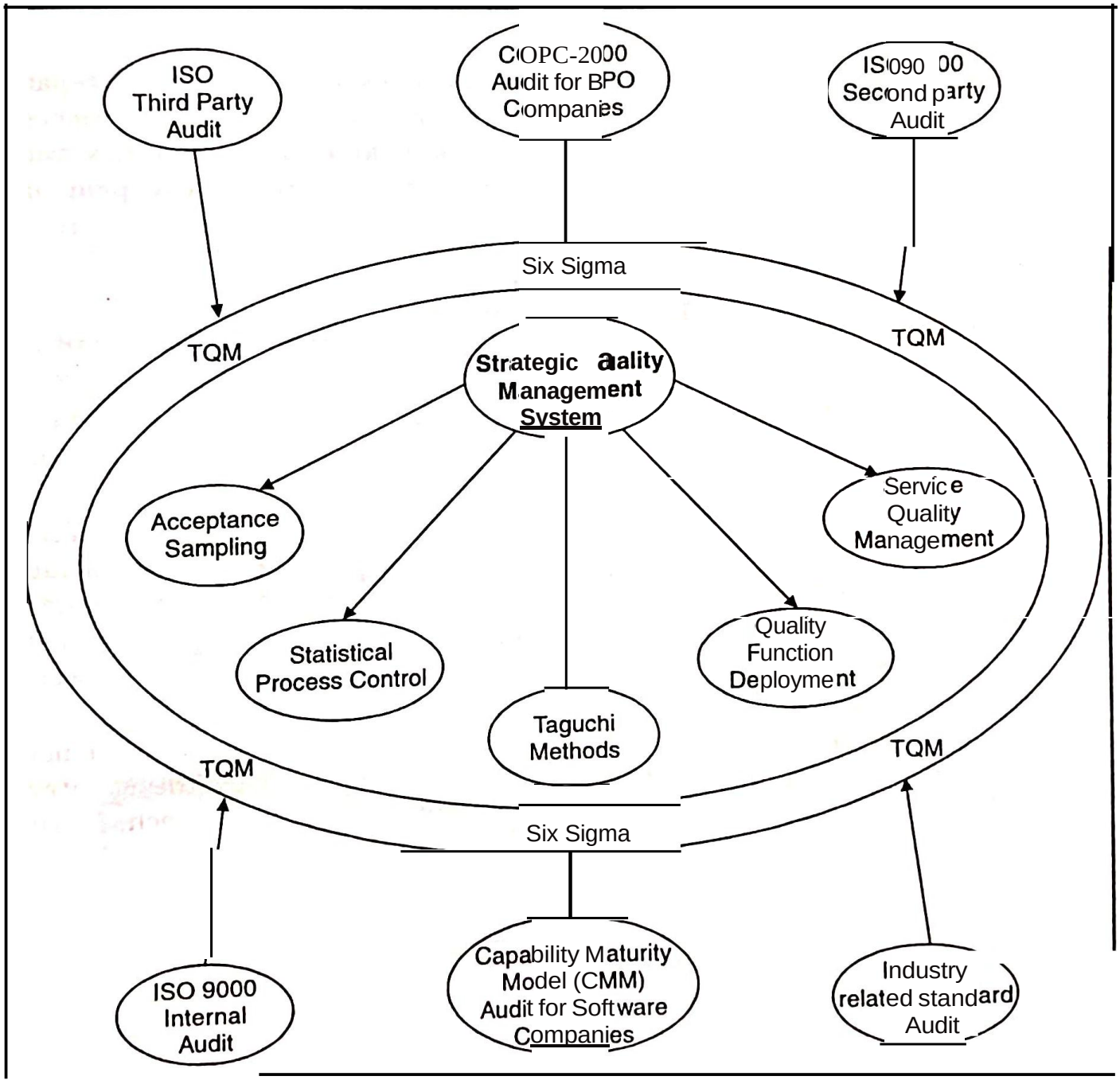
Quality Management

ISO 8402 defines Quality control as :

'The operntional techniqes and activities that are used to fulfill requirements of quality.

ISO 8402 defines Quality Assurance as :

"All those planned and systematic actions necessary to provide adequate confidence that a product or service will satisfy the given requirement for quality.



Quality guru A.V. Foigcnbnum defines 'I'otal Quality Control (TQC) I\S :

"Total quality control is an effective system for integrating the quality d,·. lopmcnt, qunlit.y-maintcnnnce, nnd quality-improve ent _efforts of he 'an us g_1·oups in nn organisation to enable marketing, eng1neenng, productrnn aud services at. the most economical levels which allow for fullcuStomer Sati fnction". Its objective is to achieve zero effect in all areas of activities lik wastage, break downs reiections accidents industrial disputes, producers, rnet_hods, boss-subordinate s r' elations , public relations etc. This can only be achieved by Total human resource involvement in the quality implementation and decision making processes.

Various Dimensions of Quality

Quality should be perceived from the customer's point of view. It is the cust?mer who decides to buy or not to buy a product or service, according to his or her perceptions of quality. **The various dimensions of quality that are considered by a·customer in assessing the quality of the pr$_1$oduct are:**

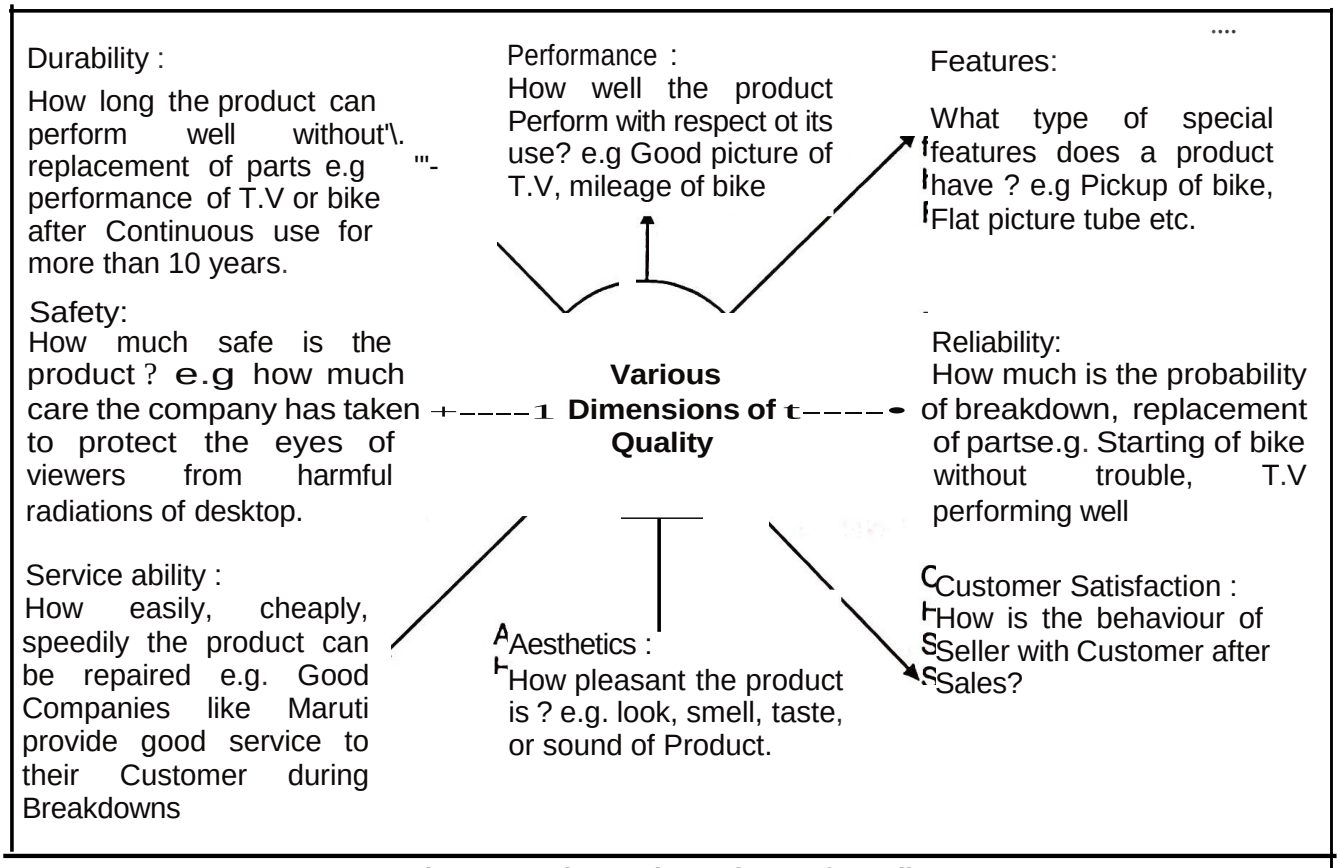


Fig. 1.2 Various Dimensions of Quality

In order to achieve the success in the mark t th the product on these eight points, especially th: us:o:::.pany _have to analyse analysed that the companies which provides good t . se1:1ce. It has been cus omer service have a bigger

shnr of consumer morkot c -d'- Muruti i's the one company which provide good custom'r care service. 'The Nokin mobile customer care centre is the another xnmplc which provides good service to the customer. **That is why the customers are ntttncting towards these products.**

Factors Affecting Quality -5WH

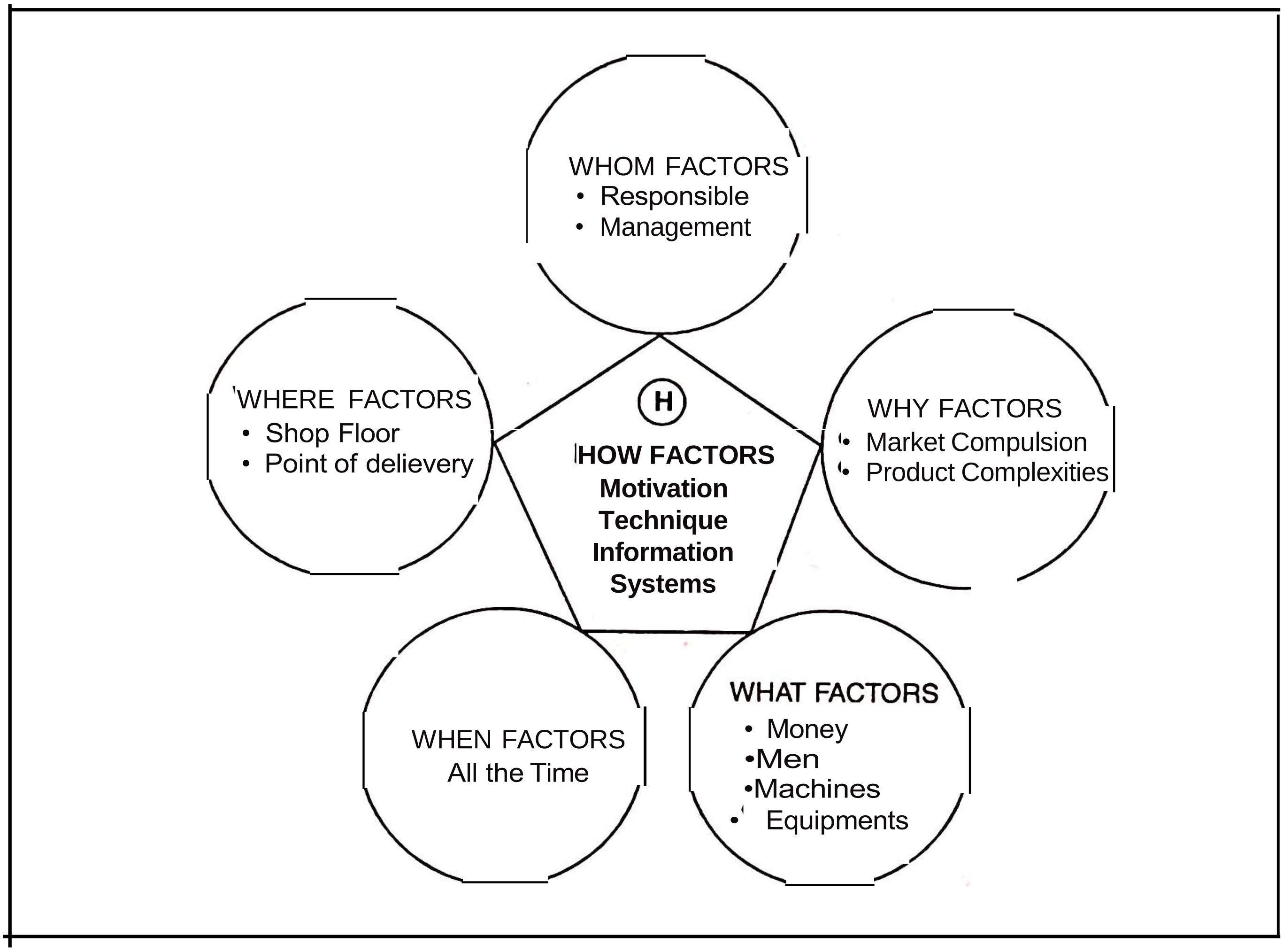


Fig. **1.3 The SWH model affecting products and services.**

Costs of Quality

Cost of quality has become the most important issue in the quality management. This is so because of the increasing investment of the companies pursuing six sigma in the training of all their employees. Quality guru J.M. Jura is known for the concepts propounded by him regarding the costs of quality.

If the money spent on the prevention of defects is increased, usually the cost of detection of defects, cost of scrap and rework, cost of warranty claims

tends to decrease. Compnmes sue[1] [0]s Motoro1n, G E Texas Instruments etc. . 't' By incurring a lot o cost for hm c saved several billions of dollars b m ia for the prevention of defects impl lmcmting qunlity philosophies such ns six s;gmal'ty into following categories in th ir products. We hnd outlined the cost o qua [1]
fig. 1.4):

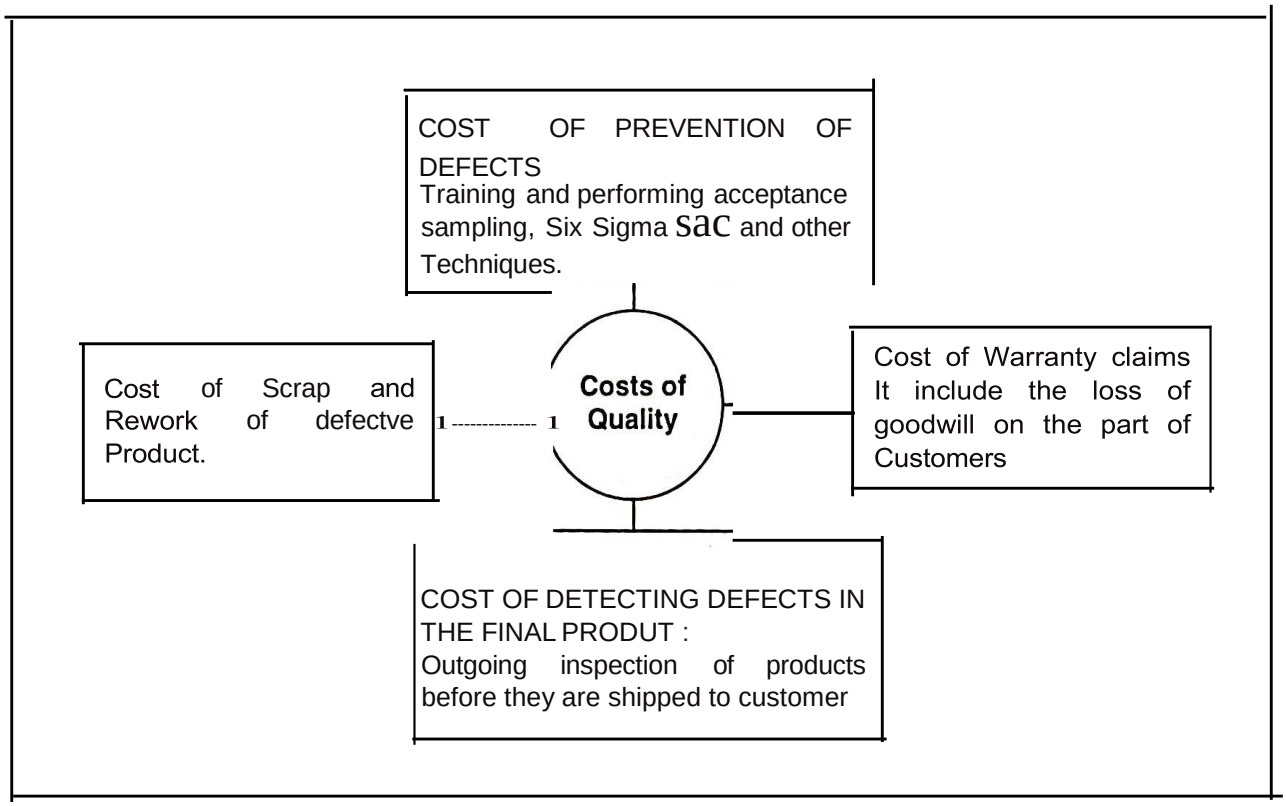


Fig. 1.4 Cost of Quality

- Cost of Prevention of defects, that is costs of training and applying acceptance sampling, Six Sigma and SQC etc. to avoid any occurrence of defects.
- Cost of scrap and rework of defective products, which include the costs of extra paper work, delay, rescheduling, tool and equipments costs.
- Cost of detecting defects in final product, that is cost incurred in the outgoing inspection of products before they are shipped to customer.
- Cost of warranty claims *i.e.* after the product is delivered to customer and it results in a loss of goodwill of the customer.

Quality GuruJ.M Juran is credited with categorizing the costs of quality into four m jor types (fig. 1.5).

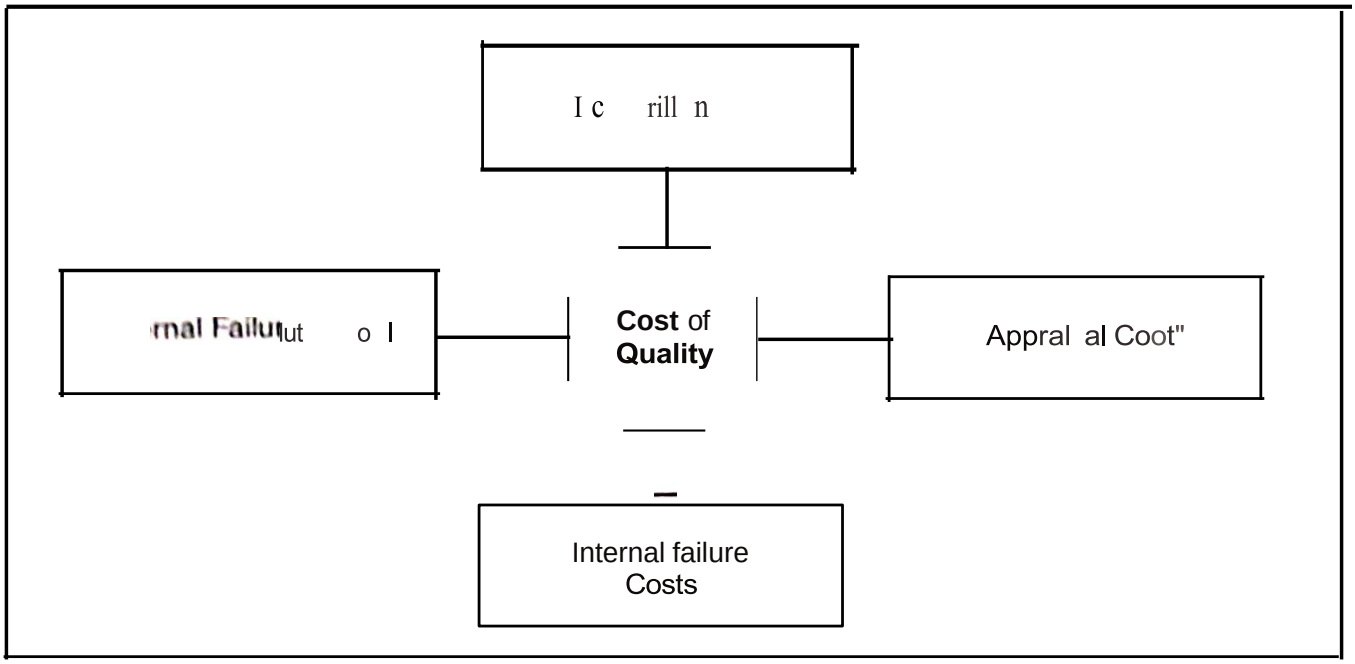


Fig. 1.5 Various Constituents of Cost of Quality

Any organization should first focus upon the prevention of defects by en uring that defects do not occur in the first place. The cost associated with this category is the prevention cost. However if a quality problem can not be prevented, the next best thing is early detection (appraisal cost). If the defect goes undetected even during appraisal, it may be. found in the next stage of activities relating to internal failure, that is the failure in the product that take place before the product is shipped to customers. The cost related to this effort is categorized as internal failure costs. The last and the most undesirable cost of quality is the external failure cost. This is the cost related to failure of product in the hands of customer, that is, after the product has been delivered to customer.

Prevention Cost

Every manager in an organization should always strive for making a good piece of product for the first time. The concept like 'Zero defect' require a considerable effort in ensuring prevention of defects. The costs related to preventing or occuring of any defect constitutes the prevention. The philosophy behind this cost is "Prevention is better than cure"

The various constituents of prevention cost are :

- **Marketing/customer related pcrvention costs**

These costs relate to understanding the customer's expectations and perceptions about the company's product. This includes the feedback from customers about the performance and reliability of the product in comparjson to competitor offering.

Icchn1qucs such ns quu r1t Y functi·on deployment and marketi·ng re""nt·ch nrc used for this purpose.

• **Purchasing rclntcd Prove ntion Costs**

Th e costs relate to con uc ting the supplier capability review by sending t nn1 of cmnpatlY personnel to the supp ier's facilities. The performance of th supplier is reviewed in time and again in order to rate them in terms of quality of supplies.

• **Design relutcd Prevention Cost**

This is the n1ain area to be probed thoroughly, b c us the ef rformance and capability of the product will depend upon the goo esign o e product.

Des·ign progress revi·ews are conducted 1n order to ensure that design i·ncorporate the expectat1·0ns of customers to the maximum possib.le extent. Other activities related to these costs are failure mode effect analysis (FMEA), testing on prototypes.

• **Operations related Prevention Costs**

Operation process validation is performed by assessing the capability of various processes, machines, tools, and equipment in order to ensue that these perform within the specification limit. This cost include the various operations support activities such as creating specification limits, data processing/clerical support, designing or procurement of new production equipment for better quality etc. Planning and conducting training of operators (e.g. quality circle, Kaizen programme etc.) constitute the prevention cost.

• **Administrative System related to Prevention Cost**

Salaries of quality personnel whose duties are purely administrative constitute a major component of these costs. Miscellaneous expenses of the quality department, such as telephone, postage and stationery fall under this head. Costs involved in developing and designing company specific quality philosophies such as TQ , ix _si_gma, 5S et_c.. w ich help in building quality awareness and promoting 1nd1v1dual part1c1pation in quality improvement efforts form these c_osts. C st involved in the.au iting of the quality system by trained profess10nals 1n order to ascertain its effectiveness are under this head.

Appraisal Costs

In the . preventi n effort of t?e organization in warding off defects, the nex t be t thingtdo't o 1s the appraisal of the products/services by measuring, eva1 uating or au 1 1ng.

The various types of costs are :

• **Testing activities**

The value of time and material spent on testinga pro d uc t or con formance to various characteristics.

The tests can be destructive or non-destruct I·Ve.

• **lns1wctlon uct.ivitioH**

Inspection in·ludcs th vuluo of time spent by employees inspecting in ming mntorinl, work in progress, completed product and data entry. The in p ti n carries out nt some checkpoints is nn Inspection activity. It is to he noted lhnt cost of re-inspection is a failure cost and it will not be included in In p ction activity.

• **Quality audits**

It is generally taken by officers in plants providing suggestion to improve the quality of the product.

• **Research and Experimentation**

It is the cost which generally include quality improvement or appraisal tools to find new design or process plan that are more economical and suitable for a particular environment under fixed conditions.

• **Efficiency losses**

This is the loss which generally occurs due to the idle time of the employee caused as a result of in-process checks, inspection and testing.

• **Chemical and Metallurgical laboratory analysis** :

Thevalue of time spent by laboratory personnel analyzing special chemical and physical properties of materials in order to determine conformance • to specifications.

• **Cost of calibration and maintenance of test equipment**

The value of time spent in maintaining and calibrating shop and inspection g u es and equipment.

• **Customers Appraisal**

Time spent by the employees on the customer's satisfaction services.

Internal Failure Costs

Internal failure costs relate to the failure of the product to meet customer specifications prior to the dispatch to the customer.

The various components of internal failure costs are :

• **Design related internal failure**

This head includes costs related to correction in product design, after the design has been released to the enginering department. It also includes costs related to unplanned production support efforts.

• **Rework and Repair Cost**

. The cost of time and material spent during reworking and repair activities.

• **Scrap**

This cost is ?ighly und sirable as all the efforts nd money spent on the roduct go to dram. Scrap item can not be used again. It increases the cost

crlv Such scroP can be controlled by Pat-t

lrt'\\H: nd \\ lv if n t ntrolll'd p1op . J •

lra kin he·,t or cnu e ,fTe:rt nnnlysis.. . failure cost

• \nt ,rinl Purchns1ng ren tcd ntc1nn handling and transportation

Thi t include the cost of di sp os1ng , sor ing the rework of the purchased

fin ming rejected pnrts. This cost also me1ue . lso constitute the 1n erna failure

m terial. The theft, damage of the mutena a

...::t.

E1'ternal failure cost

This is the highly undesirable part of the cost. Good organ1zat10ns do not wnnt external failure cost. The external e will result in lack of customer's s tisfaction. It incurred by the _company urthe product has been delivered to customer a d the P:oduct fai s at the :u::Omer's end. The repercussions of this type of failure will result in the poor img . a e of the organization.

The various constituents of external failure cost are

• **Complaint**

The first and foremost is the cost related to responding to he customer's complaints regarding the product, investigating the problems 1n the product and resolving these complaints at the customers end. The va ue o time and money spent on attending the customer's complaint is major reason for external failure cost.

> Cost of recalling and reworking would constitute a external failure cost.

> Costs related to warranty claims during the warranty period.

> There are certain instances where in a company may be sued by the customer due to quality problems in products resulting in serious health injuries to the health of the user. In case the company loses such lawsuits, heavy compensat_ion (liability) may have to be paid by the company to the consumer. This liability also constitute external failure costs. The most intangible reprecussion.of external failure is the loss of goodwill on part of customer, which is most difficult to quantify. There are numerous examples specially in soft drinks and beverages which re sometimes conta inated thus causing health problems to the consumers. As a result the companies have to pay heavy penalities to the customers.

Profit Through quality

Earlier rganiz tion use to think that it costs more to produce quality goods, b t with the 1ntroduet10n of concepts like Total Quality Management the environ en, has changed. Now companies recognize concepts like "Profit through Quahty • Manu ctures have now realized that quality and cost ot only complement, but also su .plement each other. Quality is concerned with

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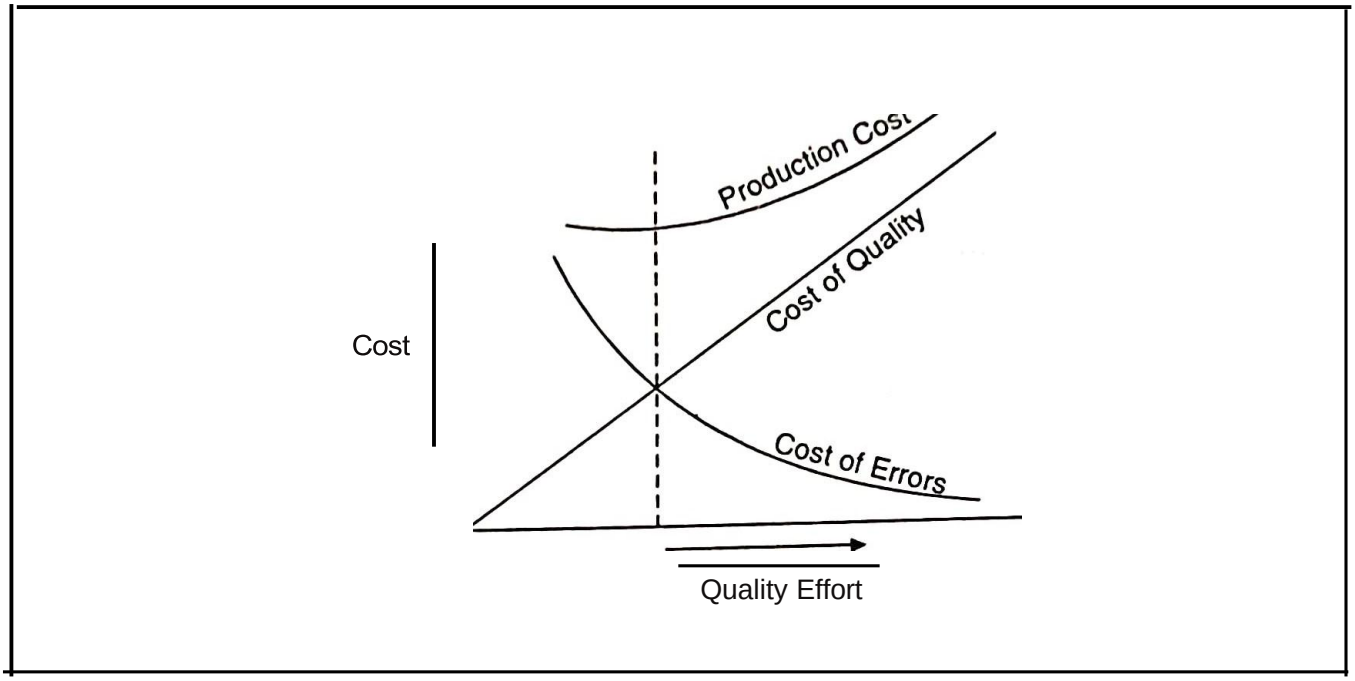

Fig. 1.6 Quality Effort vs. Cost

The above fig. shows that as the quality effort is increased, the cost of providing the effort through extra-manpower, inspection effort etc. also increases. But at the same time the cost of errors, faulty product etc. decreases thereby reducing the rejection of materials. Thus extra-quality effort result eventually in savings. Quality can never be improved by providing extra-manpower and resources. Good quality can only be achieved by in1proved processes and better training and education of employees.

TOTAL QUALITY MANAGEMENT (TQM)

Leaming Objective

Thi"'chapter, will nnswor the following questions.

, ning of Total Qunlity Manngoment **(TQM)**

- D1 r nc b tween the traditional and TQM management tyles.

Prineipl nnd elements of TQM

V riou Fncts nbout **TQl\1**

I'- nou model of TQM

F cto which affi ct TQM

Advant g of TQM.

Total Quality Management (TQM)

Tot.al quality manngem nt (TQM) is n system approach of management that ai1n to incr as vnluo to customors by designing and improving orunizational proce es and system continuously. Total quality manuge1nent ,nolv all mploy s and oxtonds backward nnd forward to include the supply hain and th customer chuin. The word total implies, tho total quality muno , m nt i cone rn d with mnnnging tho entire sytcn1, and not only ub• y tern or departmont.

TQr-1 itt a management style bused upon producing quality service as defined bycu Lomer. TQM is o quality centred, customer focussed, fact based, team

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t t 'll = Everyone nn . ments
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Qu. lity = lectmg_u. . ust be managed.
I n em nt= Quality/uctiv1tiesm

Dcfinitlor. of TQM

. . d th l

l. TQl\l 1s management an d d control activities base on e eadership the involvement of all employees and of top management and bas ond d elopment to sales and servj_ ce. a 11 d epar t men ts from planmng an l ey t1vities focus on quality assuranc e. These management and contro ac b •i • h t: fy the customers are u1 t into products Those quah·ti·es w111c sa is h f'C: d t and services d unng th e above processes and t en o 1ere o customers.

-Japanese Society for Quahty. Control (JSQC)

2. TQM isa way of managing to improve the effectiveness, flexibility and competitiveness o f a business. **-Prof. John Oakland**

3. Management philosophy and company prac.tice t at bairn to harn ss the human and material resources of an organization 1n t e most effective way to achieve its objective. **-(BS** 5750)

4. Schmidt (1993) discussed some of the basic concepts of TQM

   > Organization are of complex system of customer and suppliers.

   > Teams and groups are primary vehicles for planning and problem solving.

   > Kaizen or continuous improvement is key element of TQM.

   > Quality-meeting as per customer's requirement is the priority goals.

TQM incorporates the concepts of product quality, process control, quality assurance and quality improvement. TQM is based on internal or self-control. TQM is not a program, it is systematic, integrated and organizational way of life directed at continuous improvement of an organization. It is management style and should merely be the means to achieve organizational goals.

TQM and different Management Style

The different management style are

I. Management by objective (MBO) emphasis the specific objectives under the control of individual managers and interfer with concepts like team work and quality which are backbone of **TQM.**

2. Management by exception is a management style that identifies immediate problems and produ es short-term results but on the other hand TQM identifies problems and aims at eliminating the cause of that *problem.*

:l. tannt!t'ment By Hc:rnlls is n munngomont style thut views part result to d<'J ıIHI on fut urc results. It is compurccJ to driving u cur in forward in" lion hy looking in tho rcur view mirror, whereas TQM is concerned with urrcnl r suits nnd wnys to improve them.

Tl;us 1'QM is quite different from these ma agement system described :1bov . TQl\I is new and different way of thinking and behaving. It is the overall cultural transformation and is not very easy to implement immediately. TQM b lie,· s in satisfying both the internal and external customers. Combining all these management and comparing with TQM.

Traditional managed	TQM managed
Traditional. managed are mostly hierarchical and rigid structure organizations.	TQM managed companies are more flexible and less hierarchical.
No respect for workers.	Workers are part of team. They are treated with request and given special importance in the organization.
Supervisor-worker relationship dependency, fear.	Interdependency, trust and mutual commitment.
No focus on collective efforts.	Employee involvement, practices through team building and quality circles.
Not much importance to quality.	Quality is foremost item.
Traditional management looks for quick fix	TQM seeks long-term solution.
It operates -in same old way.	TQM emphasizses creative thinking.
It emphasis to control people.	TQM empowers people.

Principles of TQM

TQM is based broadly on three principles which are described in TQM wheel.

1. Continuous Improvement.
2. Total Employee Involvement.
3. Customer Satisfaction.

>- **Continuous improvement** refers to both incremental (small and gradual) and break through (large and rapid) improvement to

n hiov world cluss goo s. Continuous improvement is must" tory costs, waste of h urnan reduction m scrnp, ·mvork inven unnecessa Y processes bottlene c ks a nd over production, queueing, xc workers movement.

Totnl Employee Involvement i ananot erprinciple o TQ11. Th\ best woy to involve employees is eam buildi gau d moti ation. Total employee involvement can be introduce in an organization by implementing appraisal system, customer impact, competence reward system and empowering the employees to act and evaluate theiraction. Communication with staff at all levels regularly both formally and informally to promote two way communication at all levels is an another way for total employee involvement.

> **Customer Satisfaction**

The philosophy that TQM is customer oriented and its goals is to satisfy the customer seems straight forward.. Customer satisfaction can be achieved only when the company defines customer needs from the customer point of view, and not from its own point of view.

For this, the customer must be the centre of all the activities carried out in **the organization.**

Measurement domains

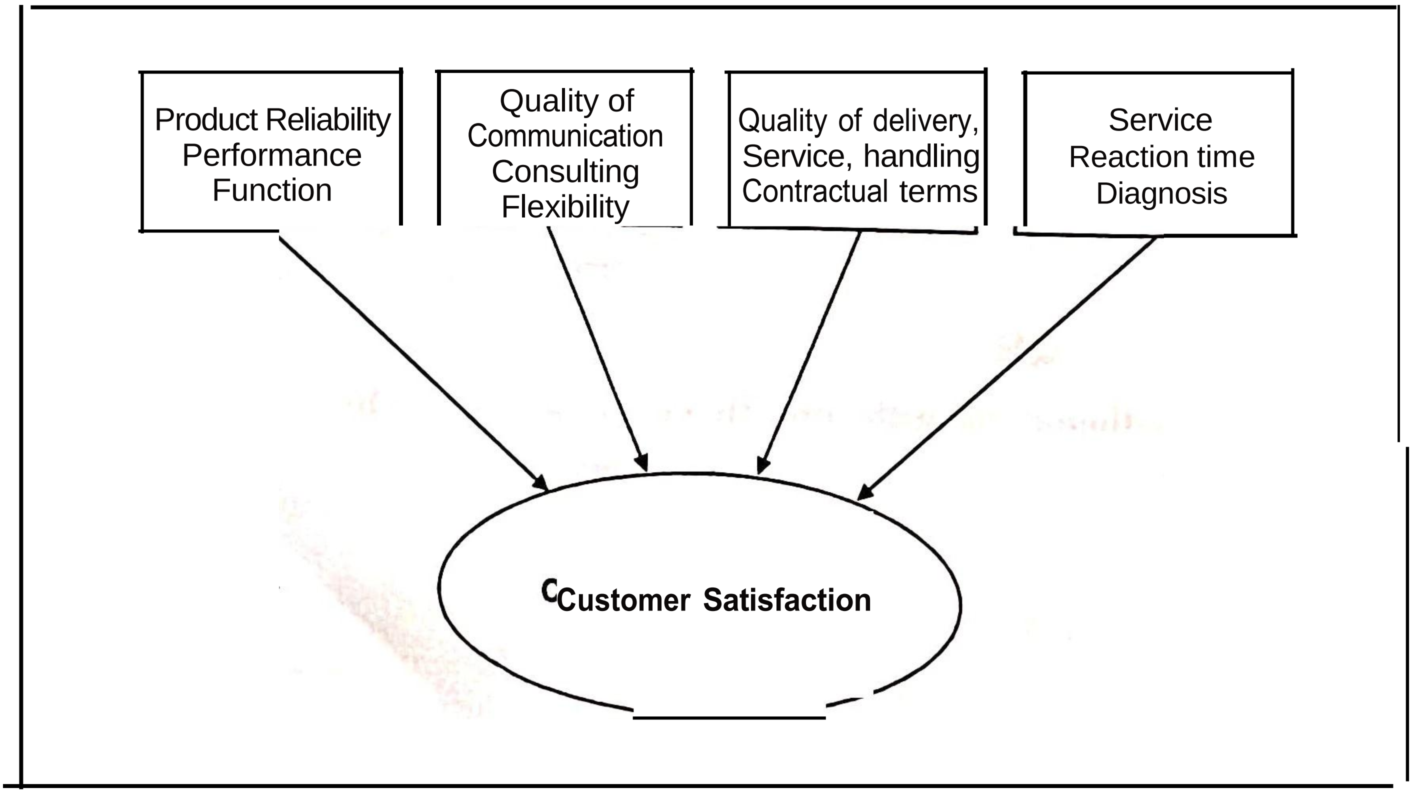

Fig. 2.1 Activities affecting Customer Sat1· sfaction.

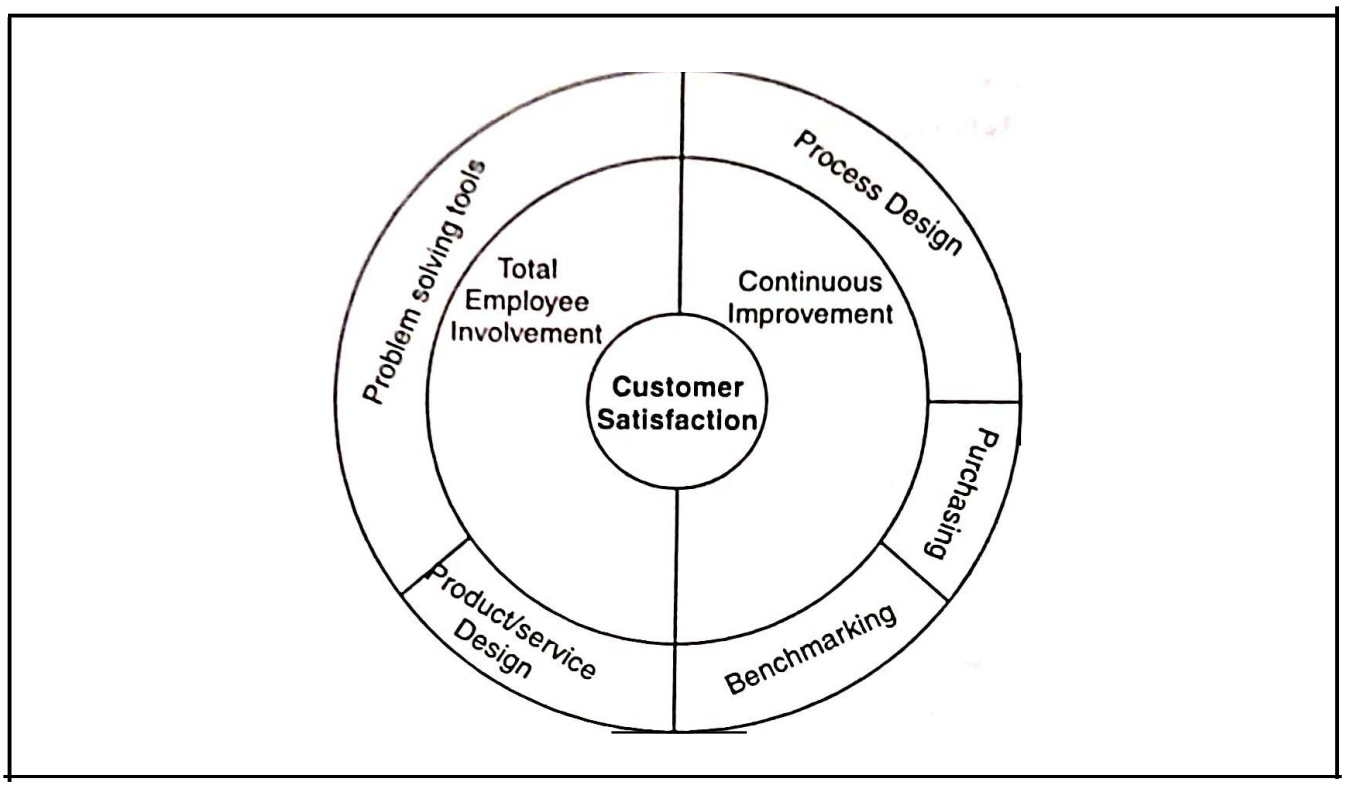

Fig. 2.2 TOM Wheel

TQM wheel contains benchmarking,. purchasing, product/Process design, Problem solving tools which will discussed at later stage in the book.

filstory of TQM

Most of the TQM .concepts originated with the work of Dr. W. Edwards Deming, the American statistician who guided Japanese industry after world war II. He formed his ideas during world war II by teaching statistical methods to American industries to improve quality of military products. **TQl\1** was developed in the mid 1940's by Dr. Deming who at the time was advisor in sampling at Bureau of Census and later become professor of statistics at New York University Graduate School of Business Administration. He had little success convincing the American industries to adopt **TQM,** but his methods were readily adopted by Japanese.

After World War II, General MacAuthor alongwith 200 scientists and specialists including Dr. Deming helped Japan to rebuild the country. Dr. Deming was invited by Japanese Union of Scientists and Engineers (JUSE) to give lectures on his statistical quality techniques. With these techniques the Japanese company started turning towards Quality. The Japanese were concentrating on producing quality products. Business in United states was concerned with producing large quantities of products. Soon Japanese surpassed them with their remarkable quality products.

In 1970"'t 19 O's mnny A • on compo nies including Ford, IBM and mcnc • • pninc1plc o f TQM. This gra ua Y led t o xQ1 x bcgnn ndopt.img Dr. Dcnung ly lost to Japanese. t1ı ,r rcgm m ng some o t rn mn rkets previ ous rty concept is show below

The **brief historicnl dcve opment of qua l**

S. No.	Evolving Quality Activities	Time Period
1.	Inspection of operator	1870 90
2.	Inspection of Foreman	1890 1920
3.	lOOC," Inspection	1920 1940
4.	Quality Control (QC) department and statistical Quality control (SQC)	1940 1960
5.	Quality Assurance (QA) department and statistical process control (SPC)	1960-1980
6.	TQI\f, QA department, Statistical process control (SPC)	1990 onwards

Elements of TQM

According to Kehoe (1996), the main components of TQM are as follo,vs :

> Customer Focus.
> Continuous Improvement.
> Senior Management Commitment.
:::?>- Leadership and Teamwork.

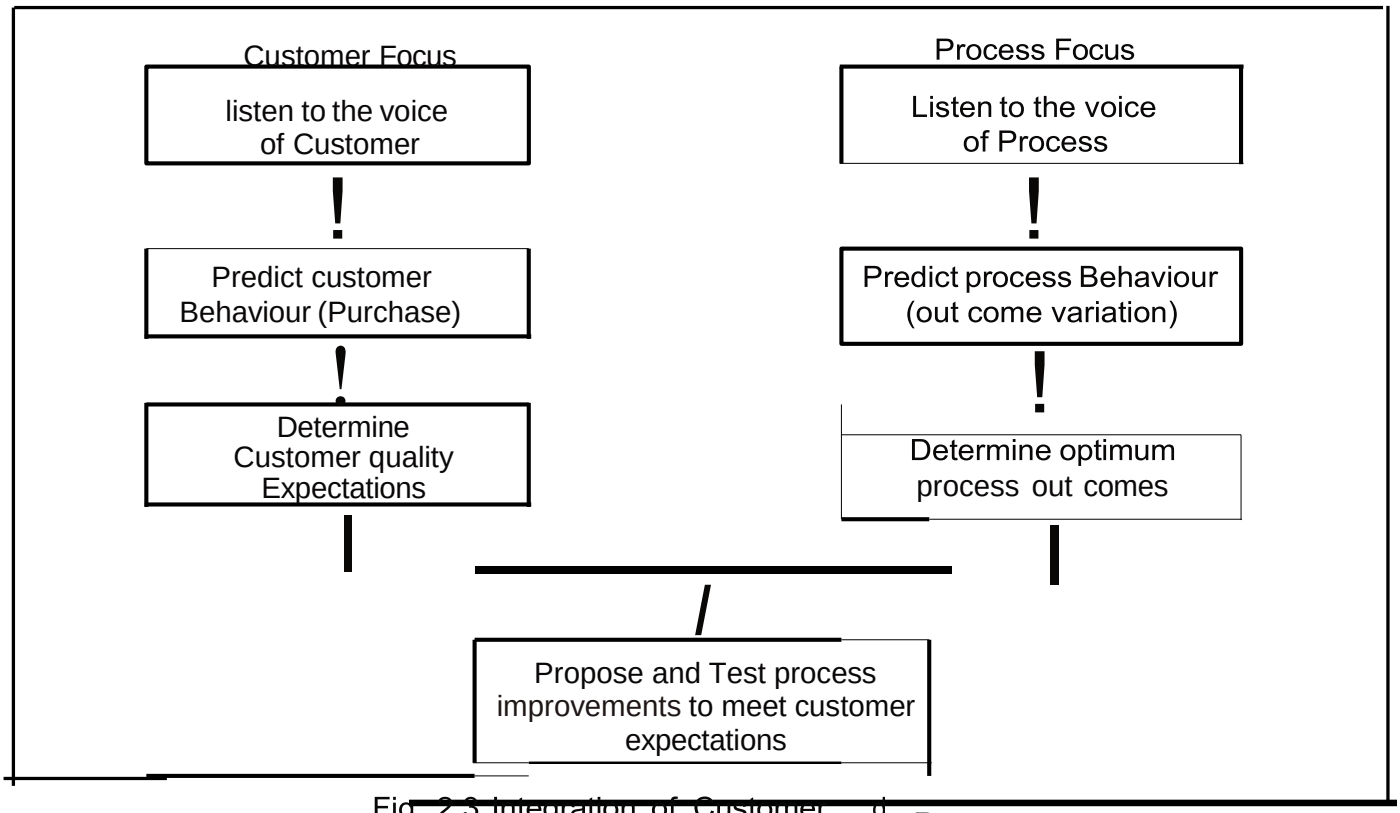

Fig. 2.3 Integration of Customer and Process

-;- Emphn is on m n ur mont nnd r v10w.

::-- ommitt,mnt to trninin(J ond ociucotion of Employees.

Own rship of tho process.

::-- Ongoing preventive nction.

ustomcr nre not only the people whom you ore selling product or offer scn·ice!S. According to TQM the customer are of two types internal customer nnd externnl customer. Internnl customers are those which are within the compnny. **The n1nnufacturing department is the customer of design and quality control is the customer of manufacturing.**

Continuous Improvement is an another important element of TQM which refers both incremental and break through improvement to achieve world class goals. **Knizen is the Japanese concept which means continuous Improvement.** The concept of Kaizen is applied on design, process methods and work force to improve continuously.

Broadly speaking quality development is a three dimensional process involving people, technique and system as shown below :

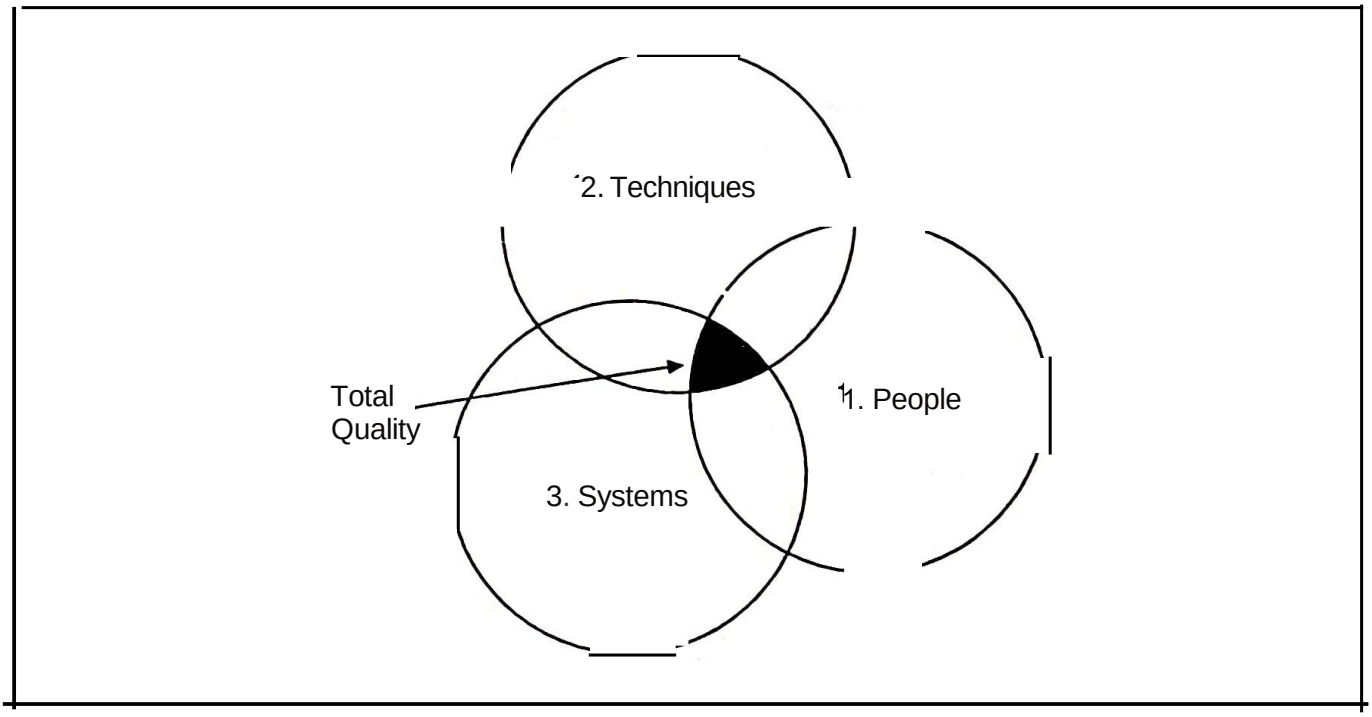

Fig. 2.4 Quality Development-a Three Dimensional process

All the three components *i.e.* people, systems and techniques carry equal weightage. Total quality is the outcome. The management challenge is with total quality and is the simultaneously development of people, systems and techniques. If the organization is concentrating on the behaviour of people the other two areas will lag behind. Conversely if the development only concern the system and techniques then the development will be brittle and when the business becomes under pressure, then the attitude may not support the organizational changes. The skills requir d to simultaneously progress in each

t be present in a single individual. nro unlikely o t am based approach is essential thl' th,·c. dimCln wn_s l ornonL nn<l n_e r:rnous in terms of operar • , nd thus omp:my wi cussed enr 181· IS e nO s inotivation. lllg 1'ht 1 ng-t rm bon >fits t st·on and employee ffi ien i custom sHt1s1nc

Pillars of TQM

rccch (1994) 1·t d five pillars of TQM that provide a strong foundntion for TQM munage d organizations.

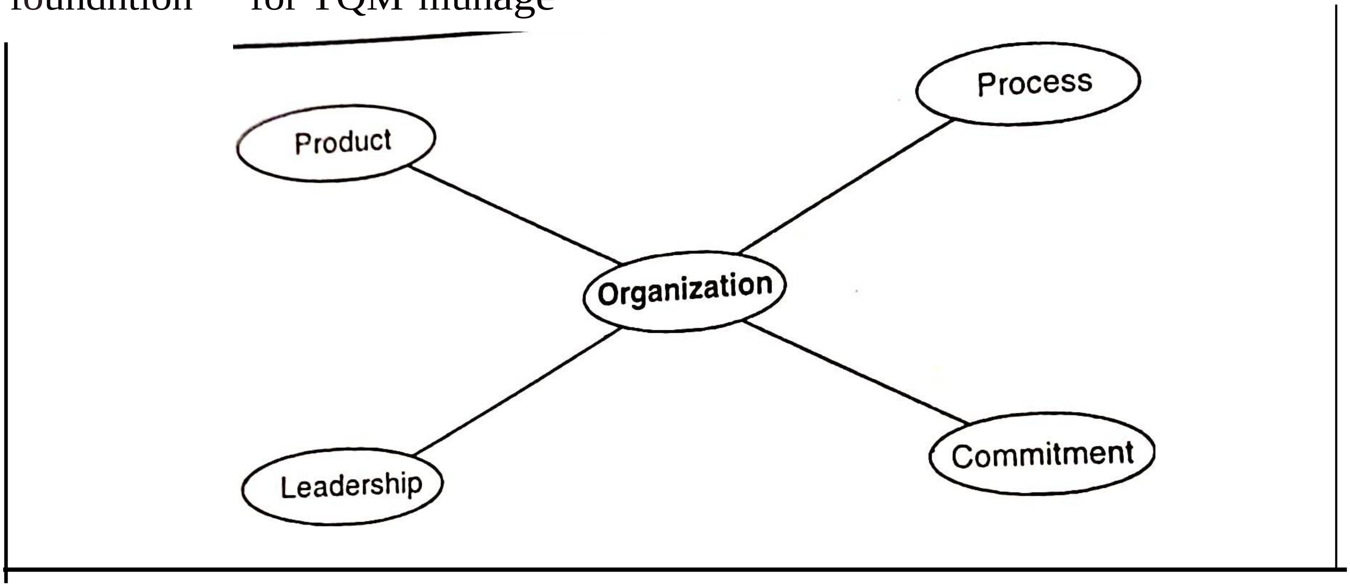

Fig. 2.5 Pillars of TQM

Product, leadership, organization, commitment and process are the five pillars of TQM. The TQM organization starts with formation of t am. The composite of team depends on top management support and the most likely approach toimplementationofTQM. It targets TQM to focus on the organizational strategy. This team provides identity, structure and legitmacy to TQM effort.

The product or service is the focal point for organization purpose and achievement. Quality in the product is impossible without quality in the process. Quality in the process is impossible without right structured organization. An organizati?n without prop_er leadership has no meaning. So, in this way l the ve pillars are essential for producing the quality product. Asa result it provides strong found tion to the company/organization. For the success of TQM, the whole organization has to act asa w e 11 o1 l e d mac hi ne. Only then the resuIts w111 improve.

Fact About TQM

***TQM* has some I va uea dd ed facts which are as follows :**

1. It *is* owned by all. No one • is superior. Everybody in the orgaJUza . tioll has a *role* to play.
2. Do not exclude of soft S's-staff kill 's , style, shared value.

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1 ,itwc nn I , v, r hnnHillf, nt·f n11iznlion c11llur h1 n •ti cl (Kuizon).

M n. 'ııı nt, h ulcl en ournH people lo Luk• initiutiv s (Totol Em1 1 y In" h' •mC'nt).

\. lu' . dditi n, gr wth ori •nt d and hnznrd free orgnnizntion (Value A dit i n .

7. r r ,t nd community responsibility should be taken.

Imp in f d ci ions nrc not the culture ofTQM (Democratic Leadership).

E,· r ·b d ho tho responsibility to chnnge.

l nrning by doing is needed (Training and Education).

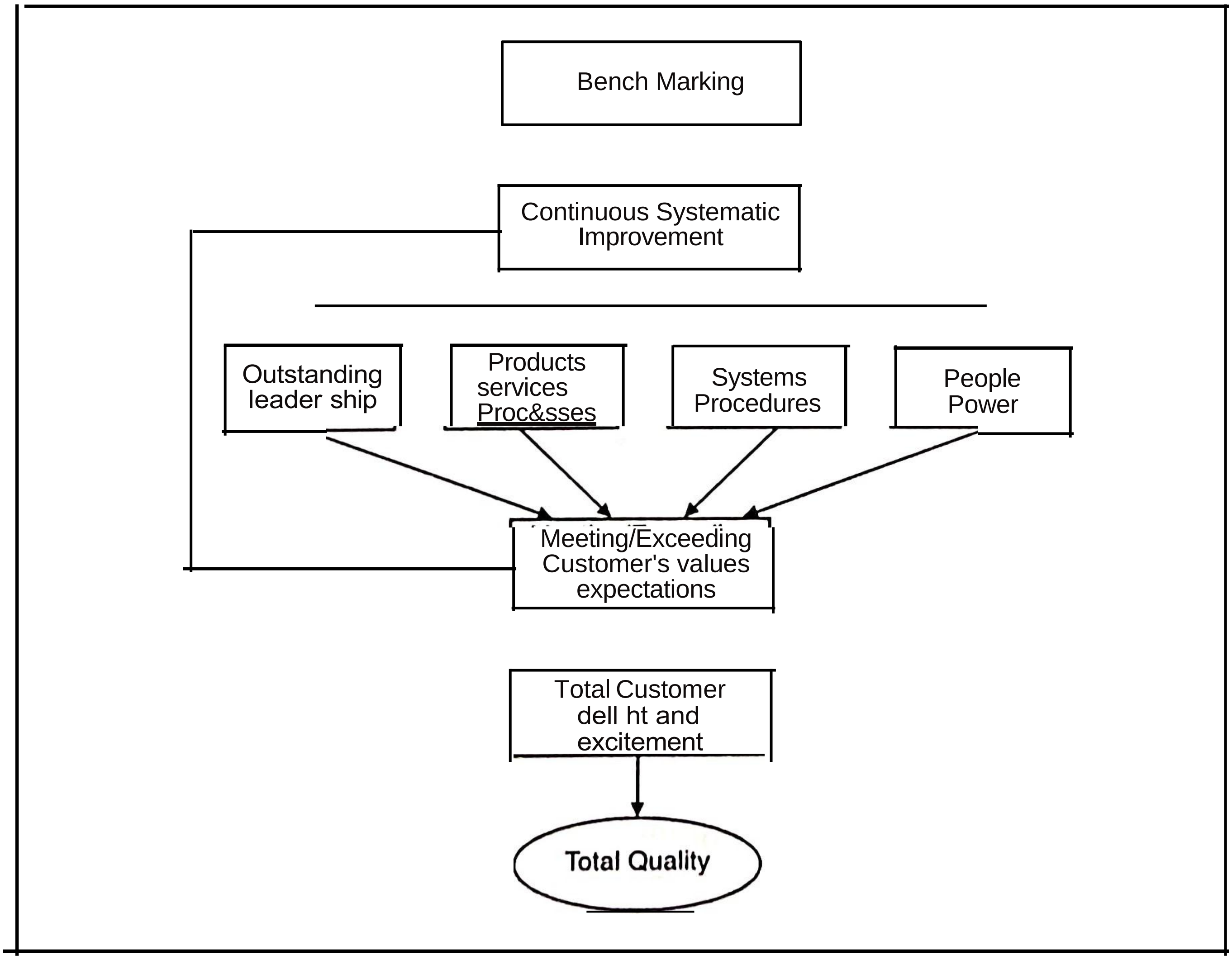

Fig. 2.6 Model for Total Quality.

'fQM Models

There are models which the experts have devei ·ped on TQM. Different experts and organization keeping in view their thinking and prevalent situation

'ffi entapproaches suitable to them

11\ th('ir 11\ ironm nt hnvo doveloped dt er] n for a 1scuss10n. The TQM• Ill d Oll)f: f th' simpl, TQM models huvo been t8 rn Ob. t'1ve 1s the same. Th e various 1'Q els u1scussci below nro different, but their O ec th d t tr models hav utilized the same p r m c1p1es fi or 1mprov1ng 1n eir pro uc s qua1lty and th ir s) stem.

Norman Rickard Model

This model is developed by Norman Rickard, vice president of qualit in Xerox corporation. His framework showing six k e y en blers that constitute the 1\ model *i_.e.* Quality Network, ommumcation, Role mo elling, Recogimtion and reward, Training and standards and measures put 1n form of a fishbone. These six key enables to give lead to two priorities *i.e.* custome satisfactio n and employee satisfaction and as a result in market share of th e company increases as well as revenue and profit earned will be more.

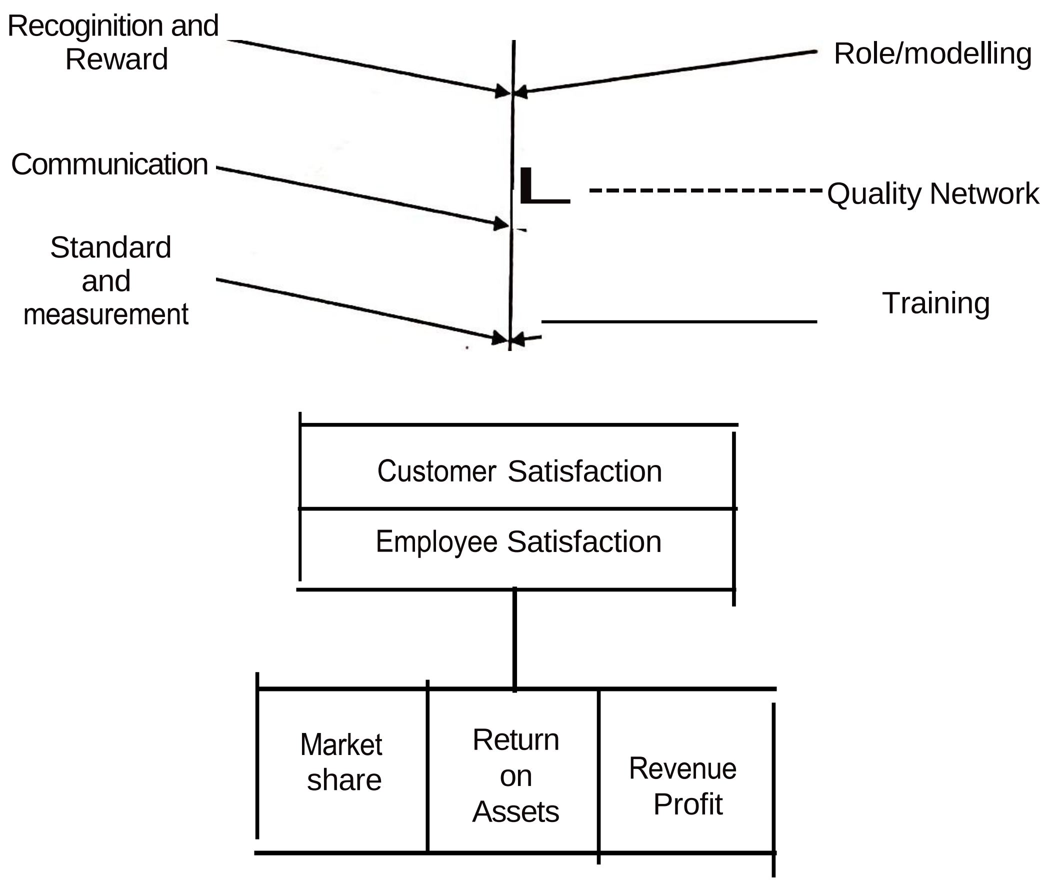

Fig. 2.7 Norman **Rickard Modelf** **or TOM** Implementation

Basic Framework Model

In the basic framework modele t place of SPC. Other elements of TQM xaperJs p t total quality control (TQC) in re ust 1n Ti _me (JIT), Statistical Process

, nt1 l SP mrl Totnl Employ "lnvolv •m nt (TEI). 'l'h world clom1production nn l c 1 hi "'-' l tlu \ll h'ontinuo11s improv mont n11d impl menling the olcmcntH f T< 1.

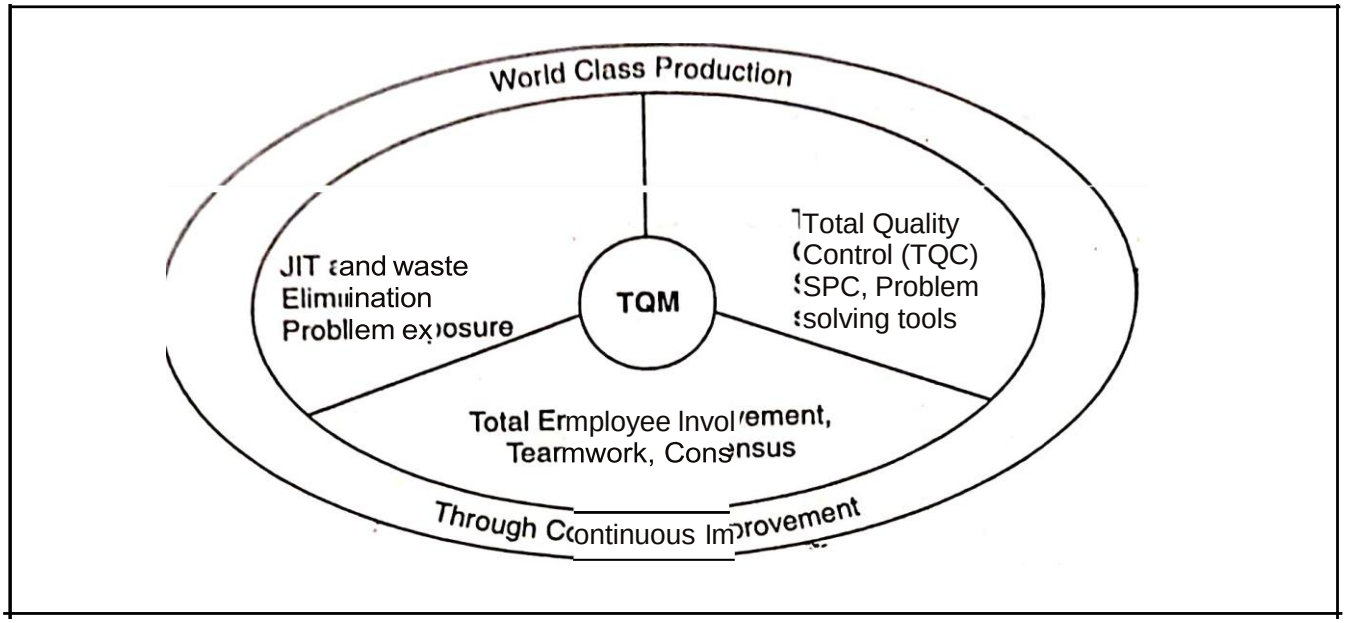

Fig. 2.8 Basic Framework-Total Quality Management

Eicher Group Model

Eicher Group has implemented a three legged stool model of TQM as shown below in fig. 2.9. This model was devised by Subodh Bhargva, CEO of Eicher group.

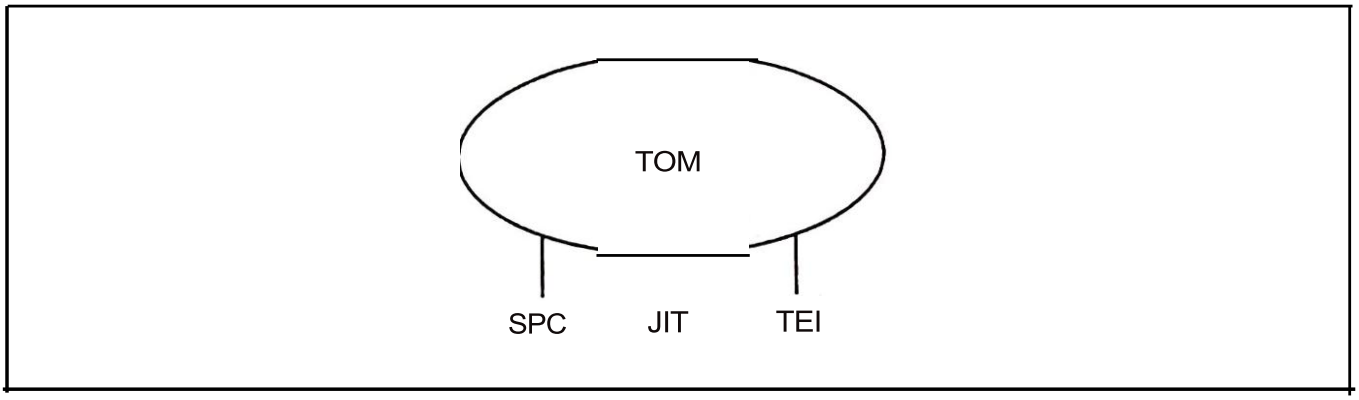

Fig. 2.9 Three legged stool model of Eicher Group.

The three elements of TQM are statistical process Control (SPC), Just in Time (JIT) and Total Employee Involvement (TEI).

Operational Model

The operational model has three elements *i.e.* total participation, problem solving tools and management support and commitment at the three edges of a triangle.

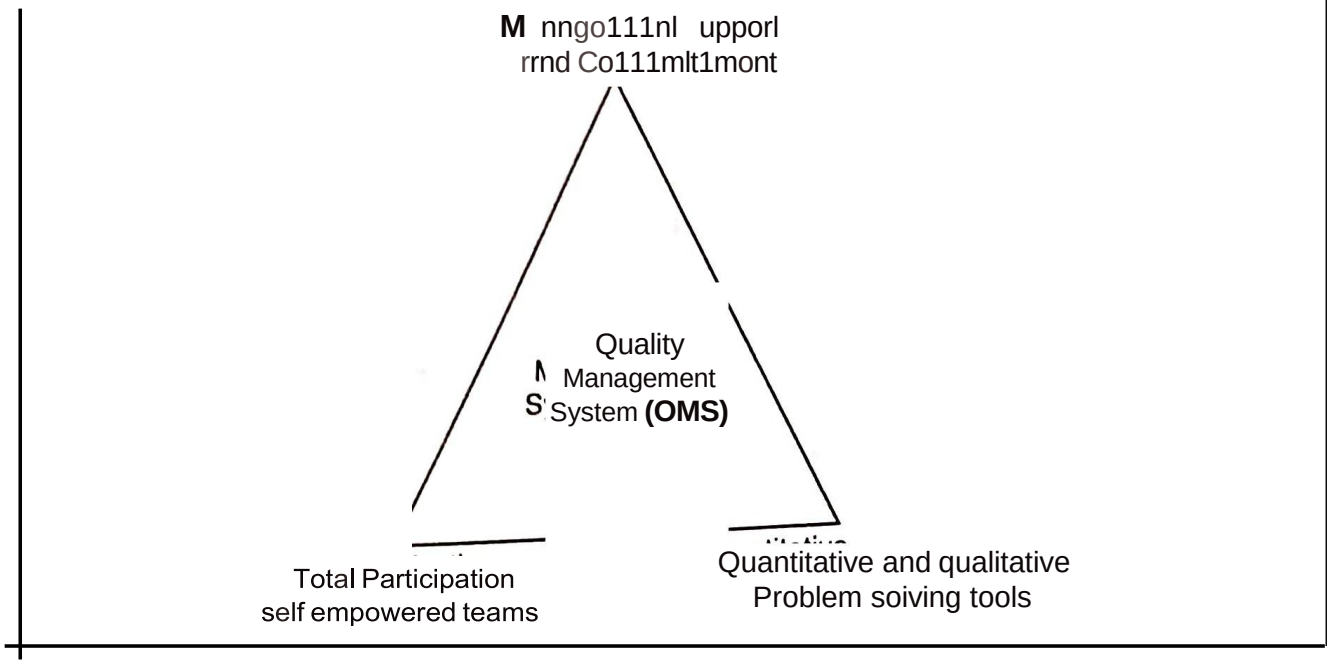

Fig. 2.10 Operational model of TOM.

Diamond Model

Diamond model lays emphasis on four characteristics of total quality management *i.e.* totality, documentation, foundation and improvements depicted in the form of a diamond. It emphasis on continuous improvement, strong foundation and complete documentation of procedures and processes of whole organization.

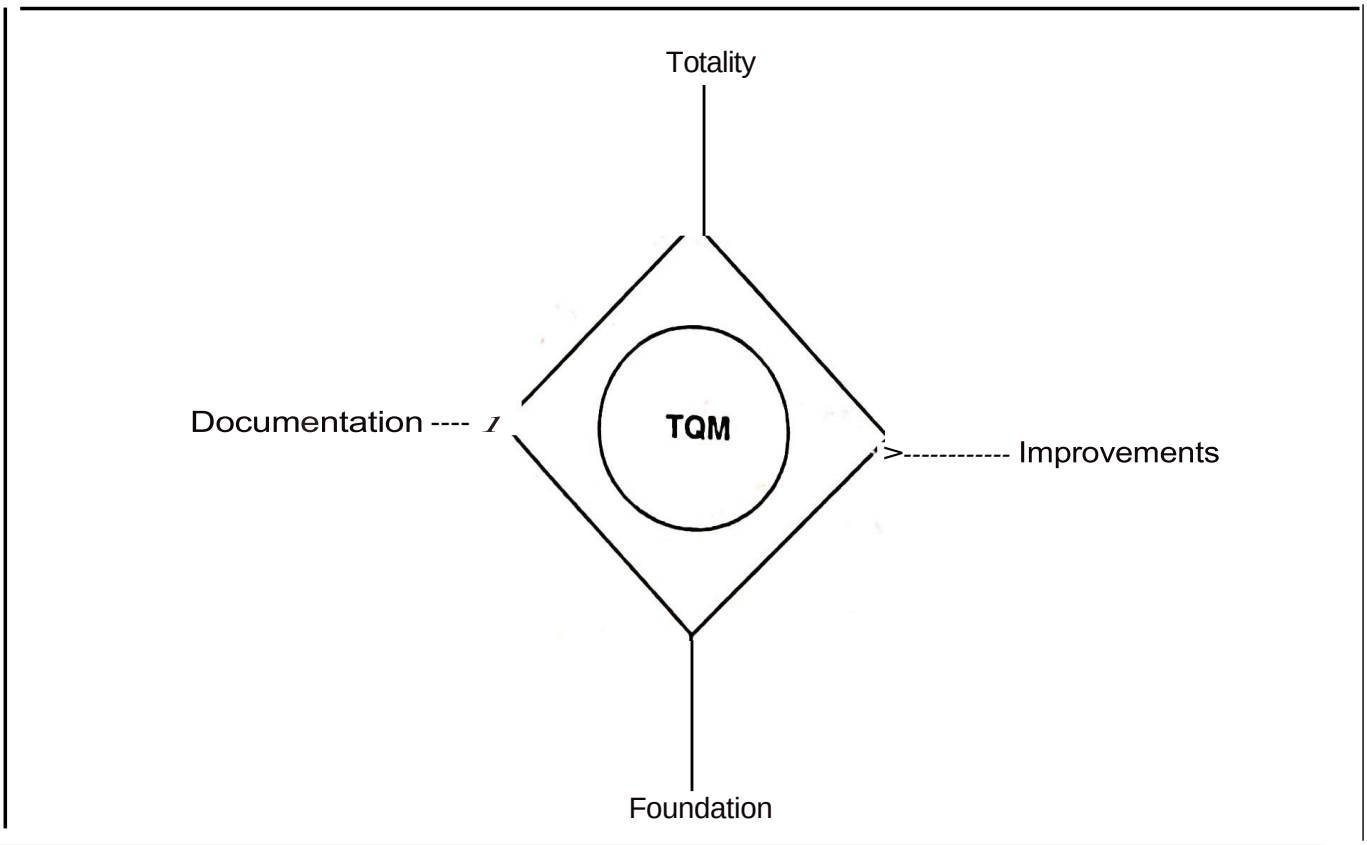

Fig.2.11 Diamond Model of TOM.

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tKin. on < 1 !1) put TQM mod I in lh Corm of nu umhr •Ila. Untl •r th{j umbf'('lt . th w,d u, 1'l\t,-ll'tnCIIIR ;,(·. Jl'r, TEl, SP ' J<uiz •n, cw tomcr "nti. lt n. qunlity A. urnnr ', Tllfi\trhi 111 •thocJs, quulity circlos le. ore included u1 th um t "lln m I,). Th, umbr lln mocJol of TQM is Rhown in fig 2.12.

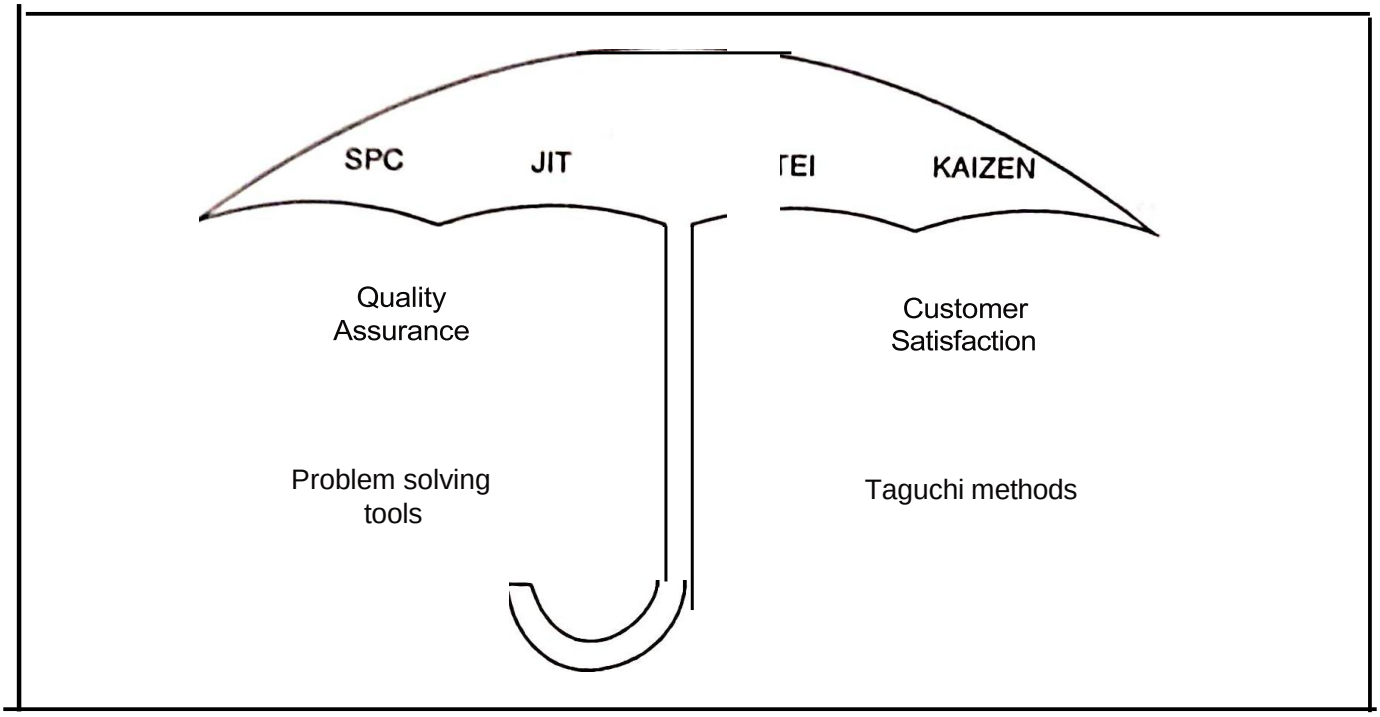


Fig. 2..12 Umbrella Model of TOM.

Kano's Basics of TQM Model

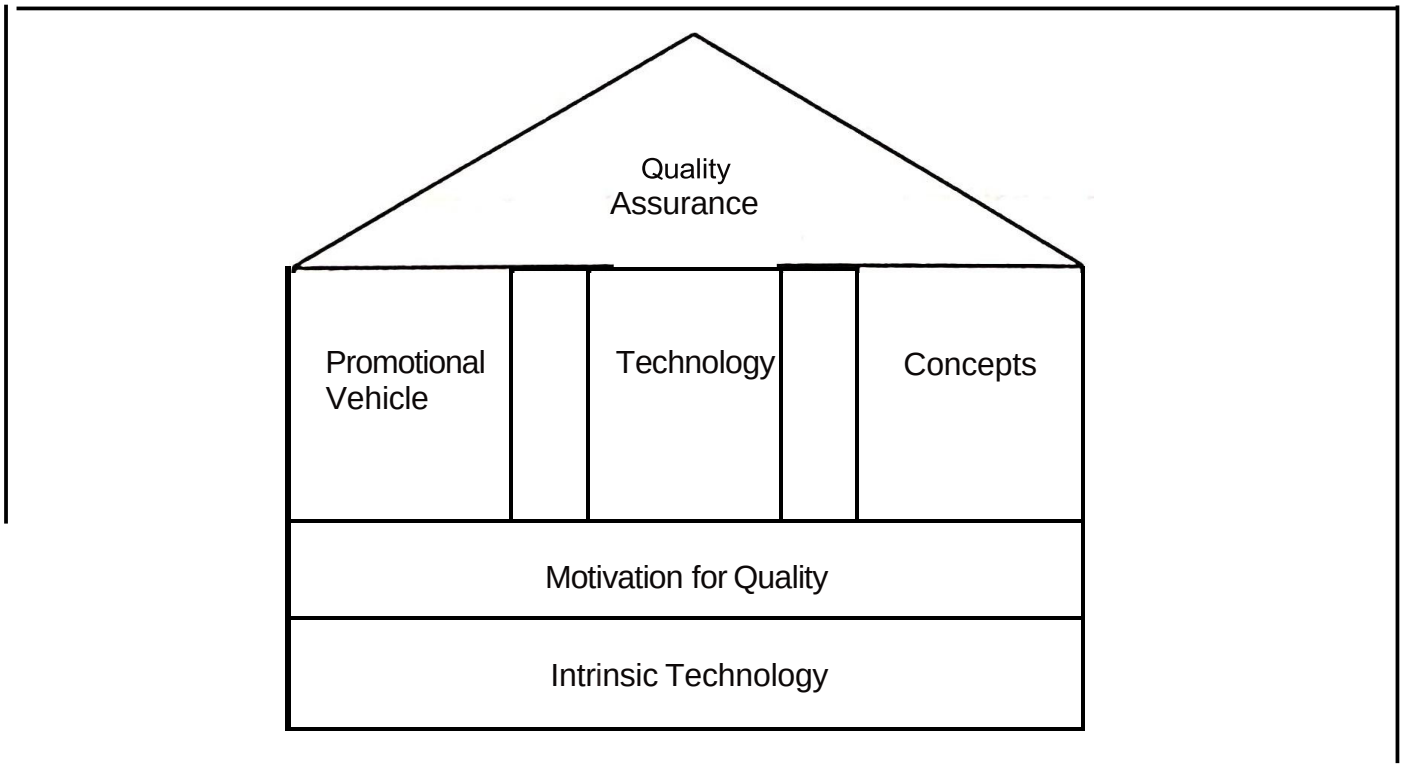


Fig. 2.13 Kano's Basics of TOM Model.

D. Noriaki Kano, Professor of 1, 'hi.. n, ,\ ha. h ,n cl v ,\oped bAy i ding to Dr. Kano's model, thkvij \I\' 'rs.it '· lt i n ",ry s11n p cm odcl ccor 11 to have strong company Proce ert h ul .. und inlrin 1 td l cry and s u s ob of TQM. The basic concept *i.e.* Put\ing Dr. l n x lain t.hr c P1llms PDCA Principle, Employee 1nvoivern ust 1ncr fir t, n,mu\0. ment by facts, ent Dr. Kano's promotionalVeh:n t hru hr p ct and cross f unc t 10 al managem n . management, team activ1 y an vendo t r TQ i r policy n1anngement, dailyh' d pillar of this model. r qunlity. Ba ic technology forms the t ir

PDCA Cycle

Plan-do-check-act (POCA) consists of the following steps

1. Plan-What is needed.
2. Do-It.
3. Check-that it works.
4. Act-to correct any problem or improve performance.

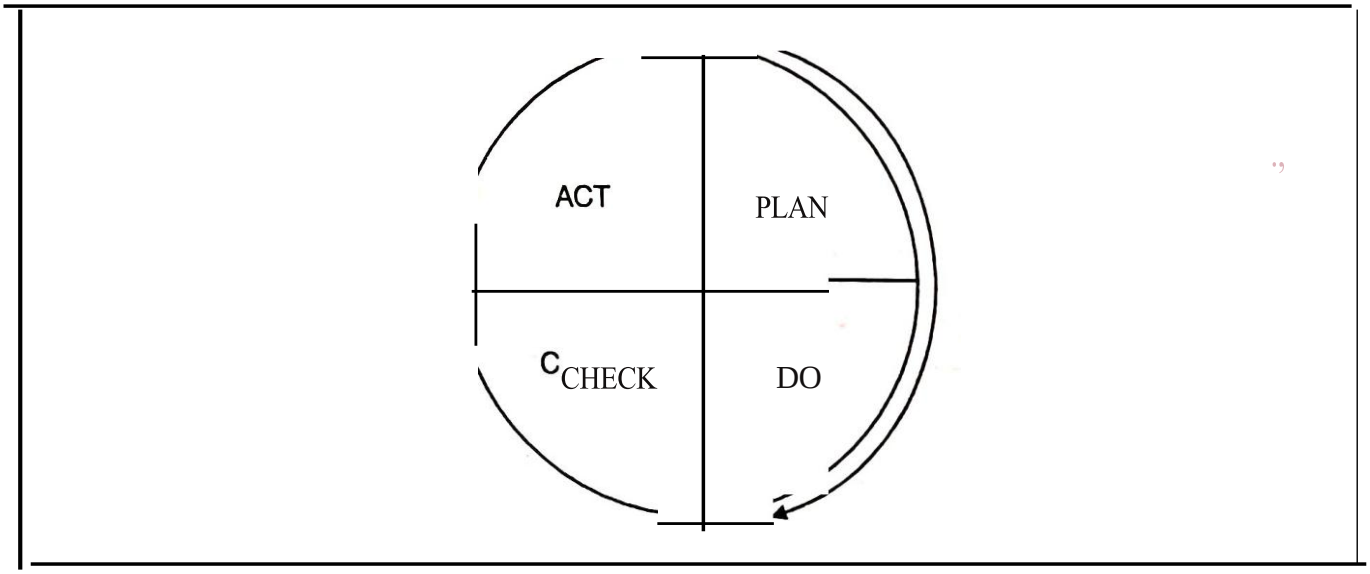


Fig. 2.14 POCA cycle

It is a universal improvement methodology, the idea being to constantly improve, and thereby reduce the difference between the requirements ofhe customers and performance of the process. The cycle is above learning and ongoJ.Ilg improvement, learning what works and what does not in a systematic V!8Y·

Westing House Model of TQM

Westing house electric corporation held a seminar in New Delhiin Collaboration with confederation of Indian Industries (CII) on "Total QualitY throug P_ë"norrna?ce 1eadersh'ip i•n 1988. The_ propo ed model h s three ents dimensions *z..e.* requirements, measurements and imperatives. Th requ1reITl re arecustomer satisfaction, employee satisfaction, stakeholder value and pubi approval.

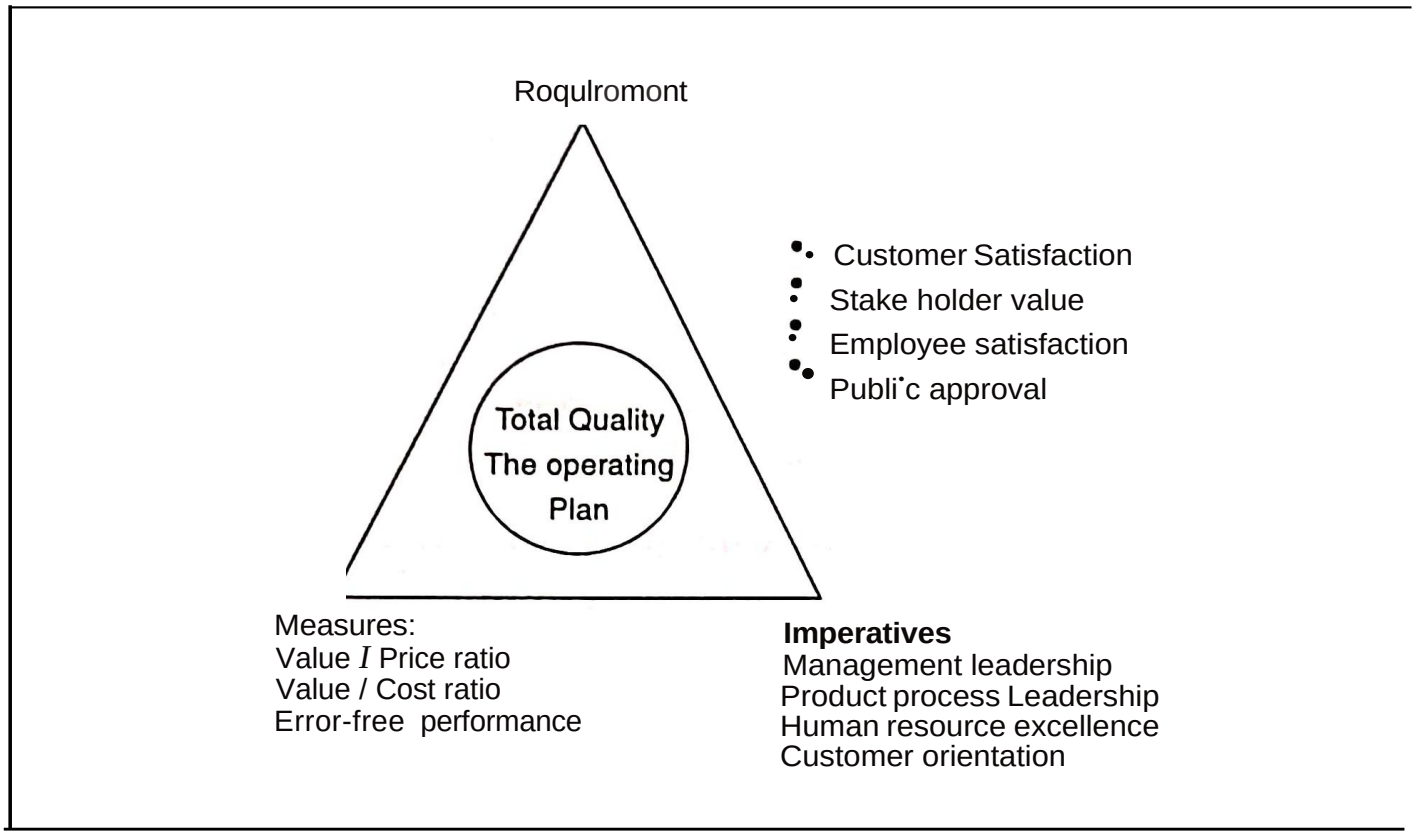
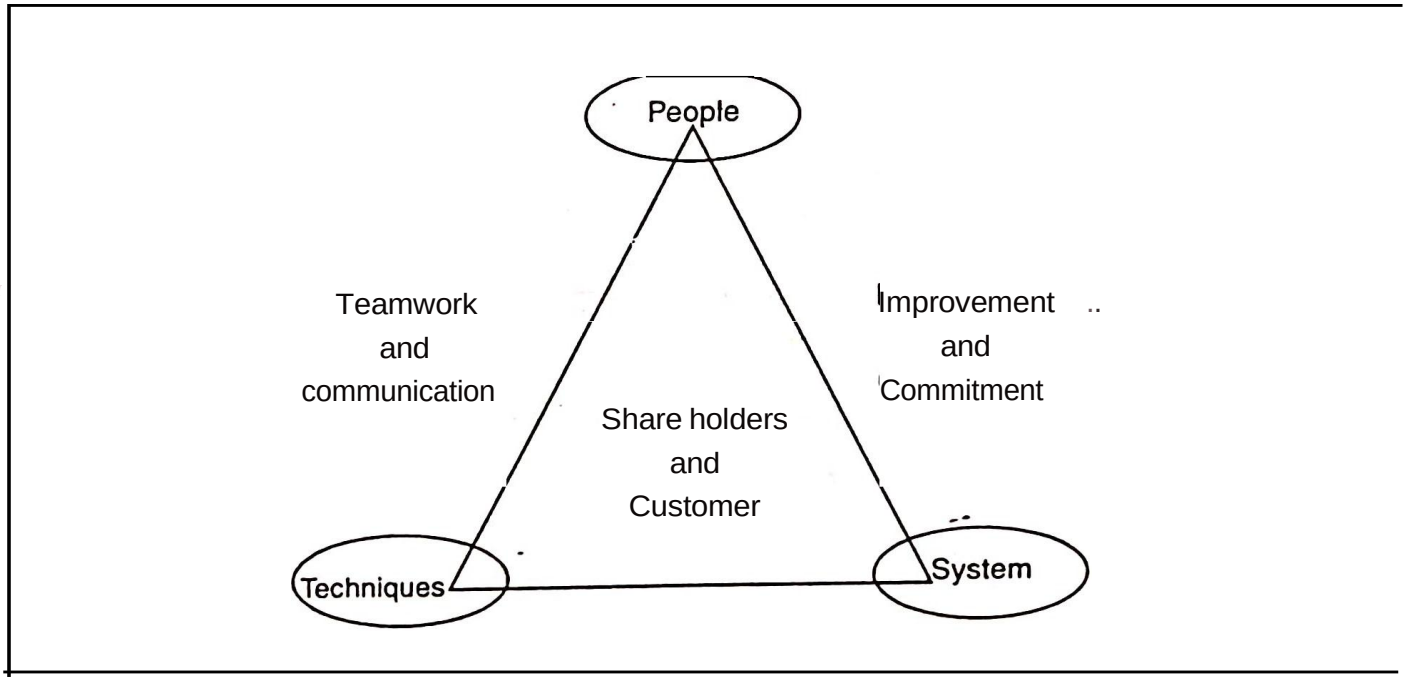


Fig. 2.15 Westing house Electric Corporation Model.

Kehoe's TQM Model

Dennis F. Kehoe (1996) explains dimensions ofquality management sud as people, techniques, and systems. These three aspects should be supporte< by training and understanding, team work, communi,#,'1tions, improvement an< commi ttment



S:ln ? 1,:; KP.hne (1996\ TOM model.

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r at1iatiot1.E, ryemployee of the organization must know tl\i,1
mm obj ctive,strategies and management framework. he1

TQ?\i-The Building Blocks

Th building block model divides TQM in three levels, the founda. tli p11lnrsand the top. These three levels together determine the st lion, ndsafet. /security of sound organization. It argues thata weakness ength re w 1l 1avea d·isastrous effect on TQM as well as on organization ino n,

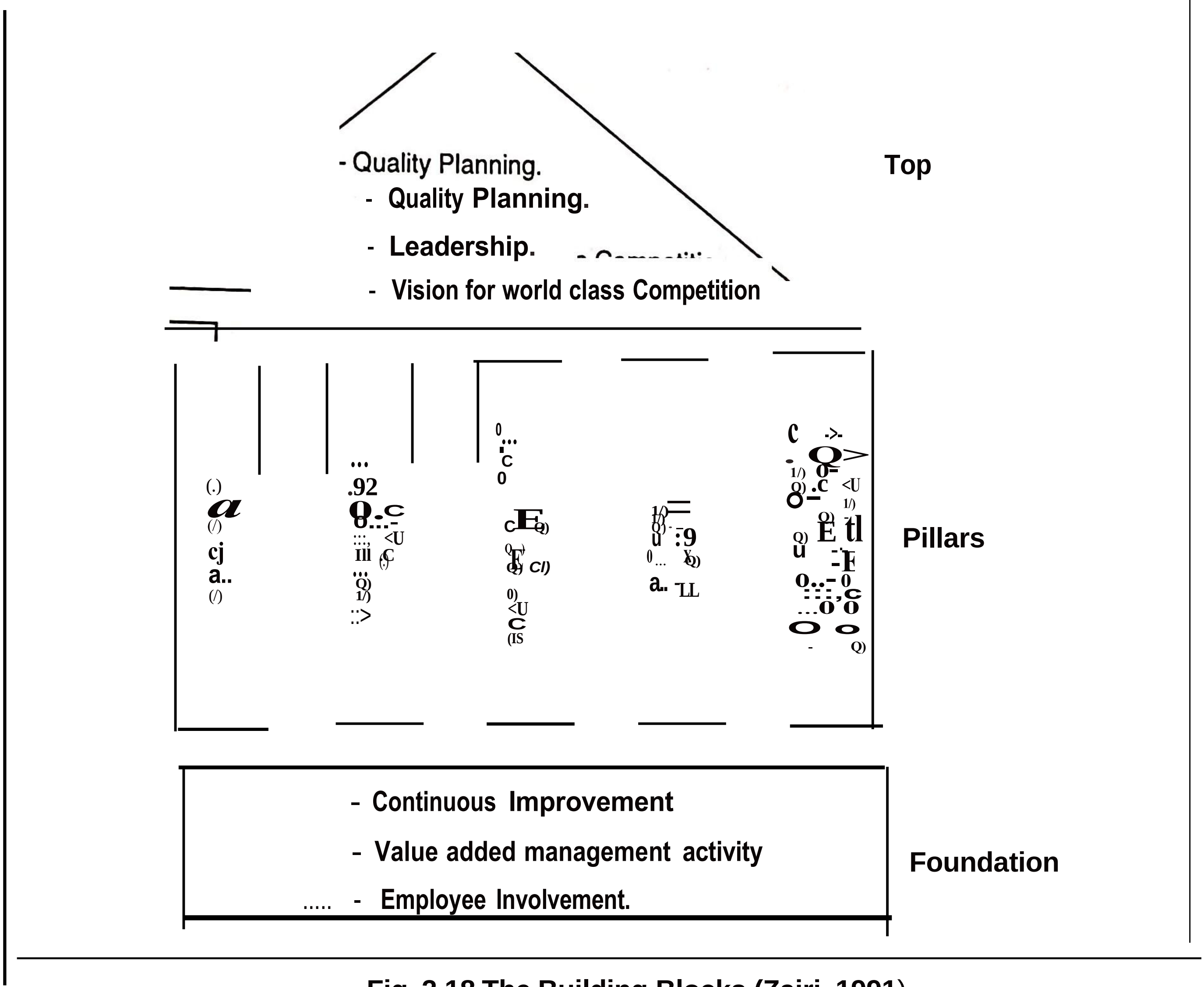


Fig. 2.18 The Building Blocks (Zairi, 1991).

1. Foundation. At the heart of any s ccessful TQM programme areth• people of the organization. The provided with flexibility to c ontrib m p r es if nurtured/cared properly and u e a n right environment to work, can tireJessl

add \ nlu to their own tnsks und orgunizution's objectives. They can solve many problm by continuous Improvement upprouch.

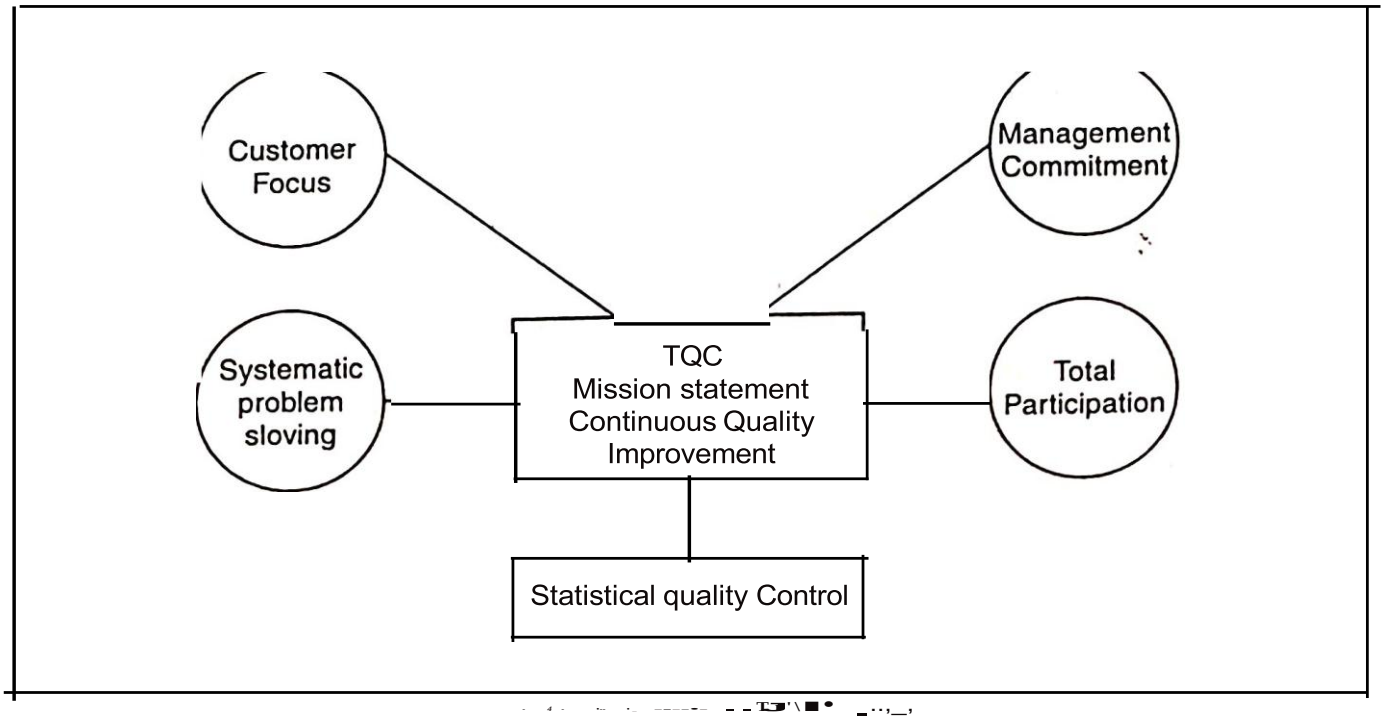
2. Pillnrs. The pillars of uny TQM programme are the means by which the humnn creativity inputs can be channelled through and converted into output which benefit the end customer. The pillars represent various quality system which represent procedures, documentation, recording and analysis mechanism, the use of statistical techniques, workplace design, ergonomics, technological innovation. The pillars provide strength to the organization. Management_should be interested in strengthening and adding extra pillars.

3. Top. This part is also very important similar to the foundation and pillars. It shields the organization from adverse external factors and protects it all the time. The top part should be weather proof in the senses it should not be affected by the adverse changes in market place and should not deteriorate. The activities of the top management or senior managers therefore in planning for quality, having a vision for the future of their organization and aspiring for world class competitiveness are crucial in this respect.

Integrated TQM Model

There are five important elements in the model

1. Customer focus.
2. Management co mittment.
3. Total Participation.
4. Statistical quality control.
5. Systematic problem solving process.



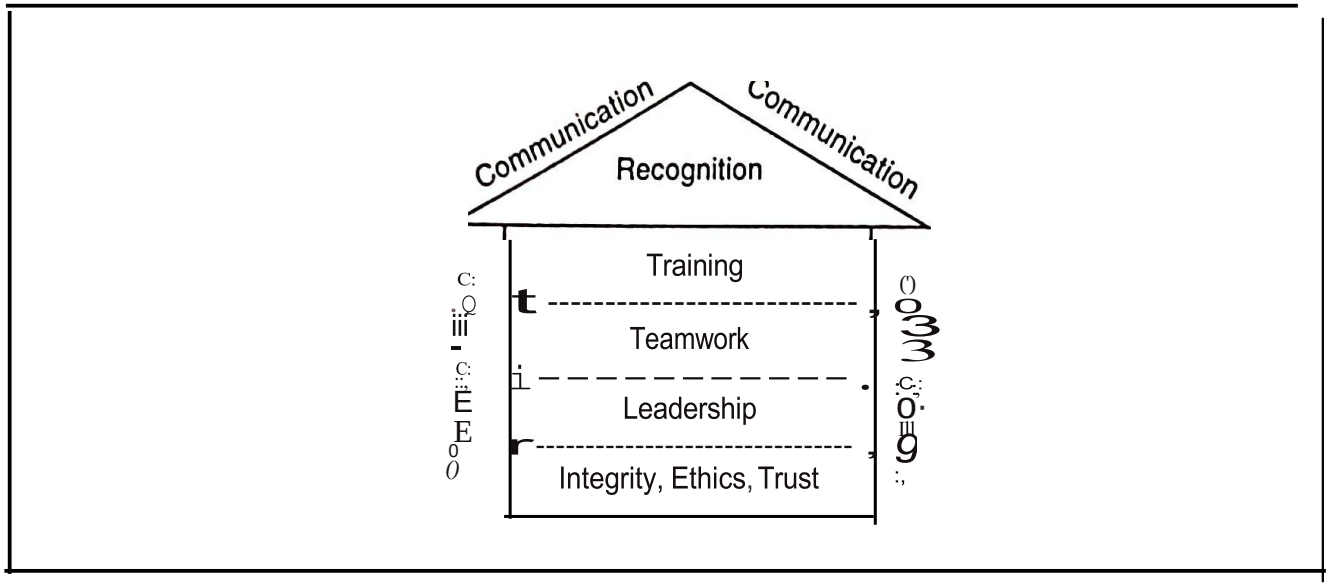


Fig. 2.20 Building **Block of Successful TOM Implementation**

The organization must concentrate on the following elements for **its successful implementation and working**

1. Ethics
2. Integrity
3. .Trust
4. Training
5. Teamwork
6. Leadership
7. Recognition
8. Communication

These clements are divided into four groups. The groups are :

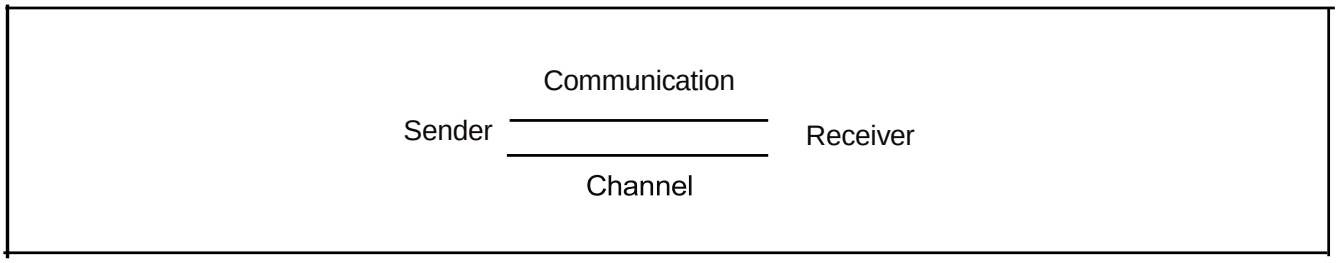
1. **Foundation**
2. **Building Bricks**
3. **Binding Motor**
4. **Roof**

1. Foundation. A strongfoundation of ethics, integrity and trust is required. Everything builds on the foundation The ultimate success or failure depends

n th' ti undntion. It hould be remembered thnt for strong organization, a tron foundntion is required.

2. Building Bricks. It includes Training, Teamwork and Leadership.

3. Binding Motor. For successful implementation ofTQM the communication is very es ent.inl in the organization. Communication means understanding of ideas between sender and reciever.



Communication can be horizontal vertical or diagonal. The success of TQM depends on communication with and among all organization's members, supplier and customer.

4. Roof. The last part of building block is the roof. After the strong foundation of ethics, trust and integrity is laid down, the teamworker training and leadership with good communication in the organisation helps to identify the product and organization in the markets. The organization got recognition.

Environmental factors Affecting TQM Implementation

Implementation of TQM principles is not an easy task. It requires lot of goodwill, faith and sincerity in the organization. There should be harmonious relationship between employee and employer.

These are numerous factors which affect the TQM implementation, Broadly it was categorized into two parts :

1. External
2. Internal

The External factor is generally affected by the following factors

1. Social Environment.
2. Technological.
3. Legal Political.
4. Economic Environment.

External factors. The various external factors which effect the implementation of TQM are as follows :

I. **Social Environment.** It includes community influence ethical consideration, social constraints, values and tastes and behaviour system.

2. Technological Environment. It involves technical skills, managerial

-1-!11- -- M""" nrn,fort :mrl material equipment innovation.

consideration

4. Econ

considerations, supplier tha

The various Interna TQM are listed below :

(a) Customer (Inter.....
(b) Employee.
(c) Strategies and policies.
(d) Business processes.
(e) Leadership quali liti .
(f) Shared values.
(g) Organizati i n tructure.

For the proper chievement of busine e well structured roduction, ma f them have an ruin the rganization interdepartme

r implementation of TQM in an organization and u in s goals and mission, the organisation strcutu_re sh uld u d and planned. There are different department viz. Design, m nuf cturing, finance, marketing etc. in the organization. Each h ir own policies and mission. Lack of consent, communication organization. So, for the successful implementation of TQM in there should be good communication, harmony, synergy and good ntal relationship.

Adv an tagcs of TQM

T I i a management style that has never ending improvement results. few short-term advantages and most of its benefits are long-term.

There are numerous advantages of TQM. Few of them are listed below :

1. The most important benefit of TQM is elimination of errors and doing things right the first time. It inforces the zero defect. It saves time, re ources and rework.
2. It improves the productivity of the organization.
3. It emphasis on the quality. Quality goods increases profit and thus the market share.
4. It produces the products at low costs, thus greater customer satisfaction.
5. Employees begin to develop a committment towards organization rather than just looking as nn employee of organization. They feel attached to the organization.
6. TQM uses various types of tools like, check sheets. Pareto Analysis, Tauguchi methods, brains troming, control charts, acceptance sampling charts which are v ry effective for organization.

TQM GURUS

Learning Objective

This chapter will cover the following sub-topics.

> Meaning of Quality Gurus.
> Key contributors to Quality Management.
> Dr. Edward Deming Philosophy.
> Juran's Contribution.
> Contribution of Philip B. Crosby.
> Contribution of other Quality Guru' like Masaaki, Feigenbaum, Ishikawa, Shingo, Pareto, Shewhart and Taguchi.

TQM Gurus

Many Individuals have contributed a lot to the theory and practice of quality management. TQM Gurus are the expert thinkers and philosophers who contributed substantially to the quality management. The three individuals who contributed and regarded as the "Management gurus in the quality revolution are-Dr. W.Edwards Deming, Dr. Joseph Juran and Philips B. Crosby. Most of the TQM gurus belong to America and very few of them have their origin in Japan.

Key Contributors to Quality Management

Deming : Fourteen points, special versus common causes of variance.
Juran : Quality is fitness for use, quality triology.

F 'i **'nbaunt** : Qualit , is n total field, customer defines quality.

rosb.• : Quality i fr , zero defects.

l hiktt\\·n : au " and ₎ff eel dingrnms quality circles.

Tng"U hi : Ta ru hi lo s function.

Th oth r individunls who have shaped quality management include iu aaki Imui Shigeo shingo, Walter A Shewhart, Bill Conway, W.G. Ouchi, Vilfu do pareto -S.R. UdPa, J.S Oakland.

Totnl quality management was developed in mid 1940's by Dr. W. Edward Den1ing who at the time was an advisor in sampling at Bureau of Census and lat.er became a professor of statistics at New York University. After World '\\ ar II, General :rvlacarthur took Dr. Deming to Japan with a view to reconstruct it. After following the quality policies of Dr. Deming, Japan started concentrating on producing quality goods.

\V. Ed\\rard Deming (1900-1993) Deming was statistics professor at New York University during 40's. Deming is responsible for quality improvement in Japan and United States. Deming defines quality .as a predictable degree of uniformity and dependability at low costs and suited to the market.

Deming developed Deming chain reaction which states :

"As quality improves, Costs will decrease and productivity will increase, resulting in more jobs, greater market share and long-term survival."

Dr. W. Edwards Deming was born in 14th Oct. 1900. He was awarded his doctorate in Mathematical Physics in 1928. He then worked in the US Government censu:, for many years, particularly in statistical sampling techniques. In 1943 he published a technical book-Statistical Adjustment of Data.

Deming placed great importance and re ponsibility on management, at both the individual and company level, believing management to be responsible for 94% of quality problems. Deming made the initial insight that a firm could never inspect quality into a product. A quality product combines a good design with effective production methods. Only by meeting both these conditions could a firm assure quality. He advocated never ending cycle of product design, manufacture, test and sales followed by market surveys and then redesign and so forth. He claimed that higher quality leads to higher productivity which in turn leads to long-term competitive strength.

The Deming chain reaction as described earlier is summarized follow :

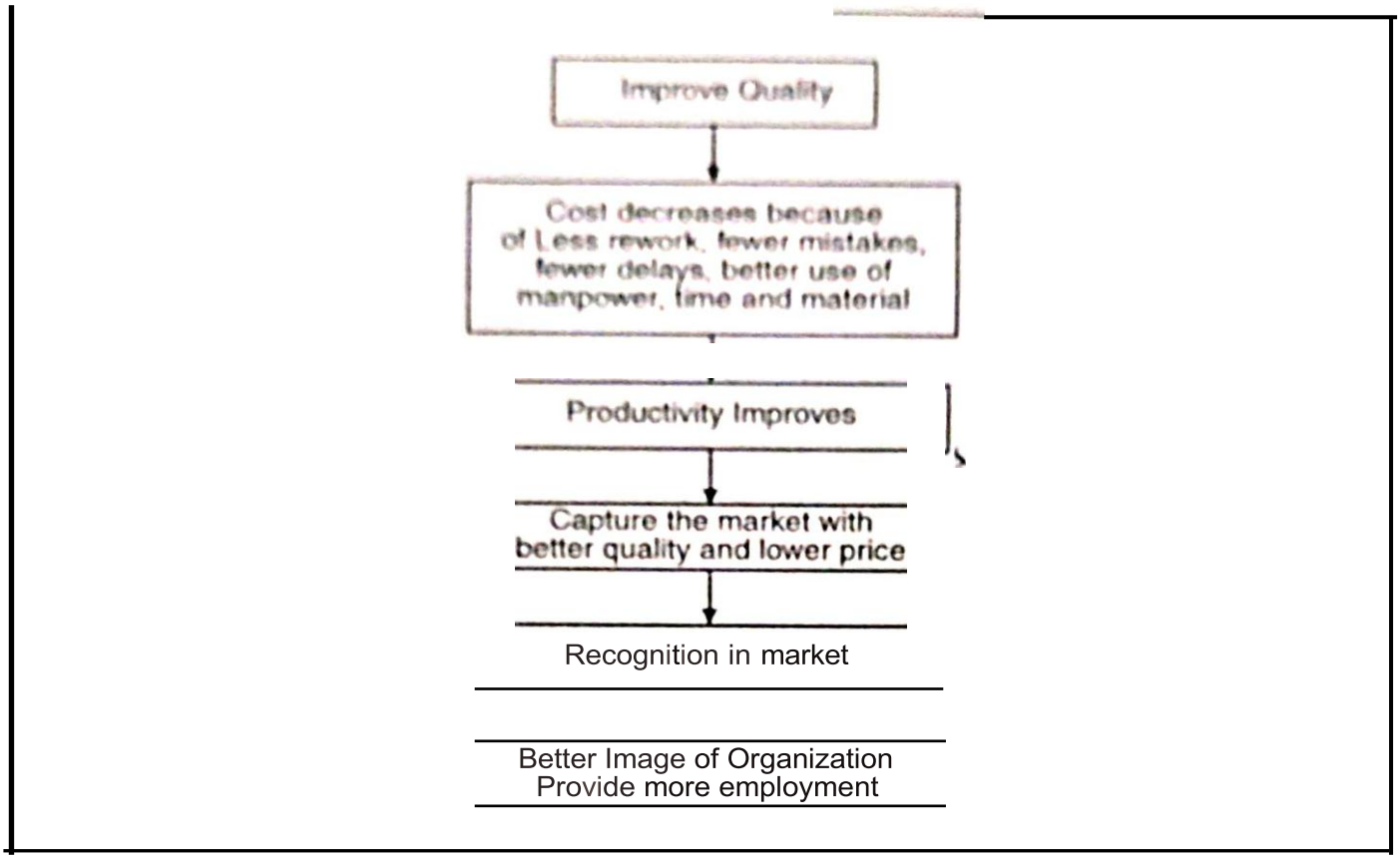


Fig. 3.1 Deming Chain Reaction.

Deming's 14 Points

ming' fourteen points plan is a complete philosophy of management that can be applied to small or large organizations in **the public, pr1 ate or service sectors :**

Create o tanc of purpose towards improvement of product or service.

Adopt the n w philosophy. \Ve cnn no longer live with commonly accepted leveI of d lay, mistakes and defective worlunanship.

Create d p nd nc on mass in poction. Instead requires statistical evidenc that quality is built in.

End the practice of awarding business on the basis of pric .

> Find problems. It is management's job to work continually on the syste1n.

> ln ti uie modern methods of training and educating the worker on th job.

>- In titut l adership and modorn methods of supervi ion of production workers. Th responsibility of foremen must b changed from numbers to quality.

> Drive out fear, so that everyon mny work effectively for the company.

> Break down barriers botwoen departments.

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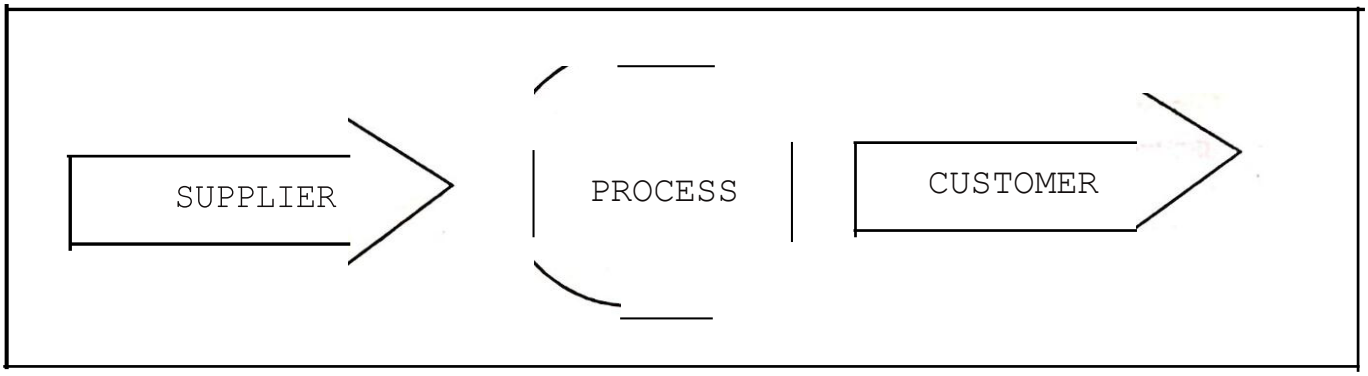

Fig. 3.7 System

He concentrated not just on the end customer but on other external and- .- internal customers. Each person along the chain, from product designer to final user is a supplier and a customer. In addition, the person will be a process . carrying out some transformation of activity.

Quality Defined

Juran defined quality as *(i)* Product performance that results in customer satisfaction. *(ii)* Freedom from produ t deficiencies, which avoids customer dissatisfaction, simply summarised as "fitness for use."

Fitness for use results from five major product traits :

(i) Quality of design *(ii)* **Quality of conformance**

***(iii)* Availability** *(iv)* **safety**

(v) field use

Quality of design. It reflects the suitability of a products design concept and specification for the intended use. It concentrates on market research, the product concept and design specifications. Juran emphasized the importance of quality of design because a poor quality of design results in poor quality product. The end quality and performance of product depends on th_e quality of design.

JUST IN TIME (JIT)

LearningObjecti

This chapter, ,vill explnin the concept of JI'I' under tho given bonds

- l\lenning of Just In Time (Jl'f)
- Definition, Objectives of JIT
- Relevance of JIT
- Concept of JIT
- Ele1nents of JIT
- Benefits of JIT
- In1plementation of JIT
- Problems encountered in JIT
- Difference between MRP and JIT.

JIT System

JIT is defined as "A philosophy of manufacturing, based on planned elimination of all wastes and continuous improvement of productivity. ,Japanese Companies became the leader of the world as they set the standards for product, quality and cost compared with the other companies of the world. Japan became an international economic power. The manufacturing companies especially in the automotive and electronic industries have ruled the world market. The success attributes to the Japanese development and use of Just-In-Time (JIT) production

After World **War-II** manufacturing sectors had faced the challe increasing the quality of their products while lowering product cost and deliv!e. the product to the customer at the right time. In order to meet the challennnt firms had to examine new approaches to mana e th e ir opera t 10ns, to impro gtt their quality of goods und services. In order to achieve these goods, the compani adopted the widely used philosophy of Just In Time production system.

..HT is an approach that seeks to eliminate all sources of waste in product i. activities by producing the right part to the right place at the right time.

Pnrts are therefore produced Jus In Time to meet m nufactun°i requirements rather than by the convent10nal approach of producing themi lot sizes and sharing and consuming them when required in the productio: stuges. Tho JIT Philosophy results in much lower size in inventory, lower cos and much better quality of the product. JIT is a manufacturing approach designec to gain maximum benefit.

"Sell one, make one {SOMO)" is the- philosophy of the Nissan and **Toyota ,vhich stress on lean production.**

IBM uses the term	-	Continuous flow manufacture
Hewlett-Packard Call it	-	Stock less Production
GE Calls its	-	Management by sight
Boeing Call it	-	Lean manufacturing
:Motorola Calls its	-	Cycle manufacturing

A JIT system works only in cases where the process is in control, thE managers know exactly when to order and the orders arrives as scheduled with no variance.

Historical Background of JIT. JIT system was development by Toyota Motor Company in Japan. In the beginning the Just-in-Time came into wide use in the Japanese ship building industry. According to a story steel maker! had over expaned. The ship builders got their steel deliveries very fast on their orders. The ship builders were getting their steel "Just-in- time". The modern application of JIT was popularized in mid 1970's by Toyota. Since then many companies in the world have implemented this philosophy to improve upon their quality and to reduce the waste. Japanese view scrap and rework as waste and thus strive for perfect quality.

JIT defined. JIT is an approach to minimize waste in manufacturing in the form of time, material energy and errors. It is a broad philosophy of pursuing zero inventories, zero transactions and zero disturbances *i.e.* execution of the schedule day-in-day out. Time is an important factor in today's competitive world. The ustomer not only need good quality product at cheaper rates but also the delivery should be very fast. That is the elapsed time between the moment that a customer places an order until the customer receives the order must be drastically reduced. The flow of the material in the factory depends

upon cycle time, setup time, queue time, handling, layout, machine maintenance and other such factors. The worker's attitude is verv vital as thev can remove these bottlenecks to increase the speed and can red ce the cycle time. \Yorkers in the JIT system are responsible of producing quality parts Just in Time to support the next production process. If some variations or discrepancies occur from the set objective the workers can modify the process or system. Through quality teams and other forms of participation, workers offer improvement to the production processes. Thus workers are involved in the system in JlT than in traditional production approaches.

OBJECTIVES OF JIT MANUFACTURING

The main objective or goal of JIT system is to produce the right quality level at the right place. Customer's demand is always given priority.

The main objectives of JIT are :

1. to achieve zero defect goal in manufacturing.
2. to provide the products when the customer wants.
3. to produce product with high level of quality.
4. to reduce the set up time and lot sizes.
5. to produce products with no waste of labour, material or equipment.
6. to produce products with minimum elapsed time.
7. to involve total employee participation which is essential for improving the product and the process.
8. to eliminate waste (such as zig-zag material flow, scrnp, mnchino breakdown, rework, Inspection).
9. to remove all the non-value adding activities by systcmnticnlly identifying them.
10. to increase co-ordination between departments and cross functional teams to work for a common objective.

RELEVANCE OF JIT

The Japanese Companies employ Total Quality Management **(TQM).** The objective of which is to form an organization where each employee at nlJ levels and in all functions can work together and make their company the best in its field of operation. Just in Time (JIT) is one of the goals of company wide quality improvement.

JIT can not be achieved without the Total Quality Management.

JIT is a philosophy or an approach to management. Its objective is not merely to reduce the inventory level, but to remove the failure resulting in scrap and rework of the material.

JIT manufacturing includes many activities :

I. **Inventory Reduction.** JIT is a system or technique to reduce inventories

and thereby econmnize on inventory carrying costs. It reduces inventory levels at all stages of production *i.e.* raw material, work in progress_and finished goods.

2. Lend Tin1e Reduction. The lead time of the product_ is considerably reduced by the introduction of JIT system. The movement tin1e and set up time is considerably reduced.

3. Quality In1provcmcnt. JIT provides a procedure for improving quality both within the firin nnd outside the organization.

4. Vendor Development. JIT can not be implemented unless the supplier or the vendor development is carried out.

JIT CONCEPT

It is actually a production and materials planning system where the production and procurement closely follow the actual demand. There are no lot size productions anywhere. As and when the item is produced it is conveyed to the next process so that there is no waiting involved at any place. In short, in JIT (i) there is no delay either due to lot size production or due to unequal production times of different work places and *(ii)* Conveyance times are also balanced. JIT is a cmnbination of single unit production and conveyor system and is called 'IKKO Nagare' in Japanese which means Single Unit production and Conveyance.

JIT is more easily used for continuous mass production of a variety of finished product. It may not be that easy to apply it to the totally customized intermittent production.

The pace or speed of the line is very important, a Ready-Set-Go (Yo-i-don, in Japanese) type of production is used on the line.

If anything gets delayed anywhere, the whole line comes to a halt. It is like every work place going through exactly the same cycle.

ELEMENTS OF JIT

. any el ments are charac_teris ic of JIT environment. They may not all exist 1n a particular anufacturmg situation, but in general they provide some principles to help in the development of JIT system.

The various elements are listed below :

1. Flow manufacturing.
2. Process flexibility.
3. Total quality management.
4. Total productive maintenance.
5. Uninterrupted flow.
6. Continuous process improvement.
7. Vendor development.
8. Total Employee Involvement.

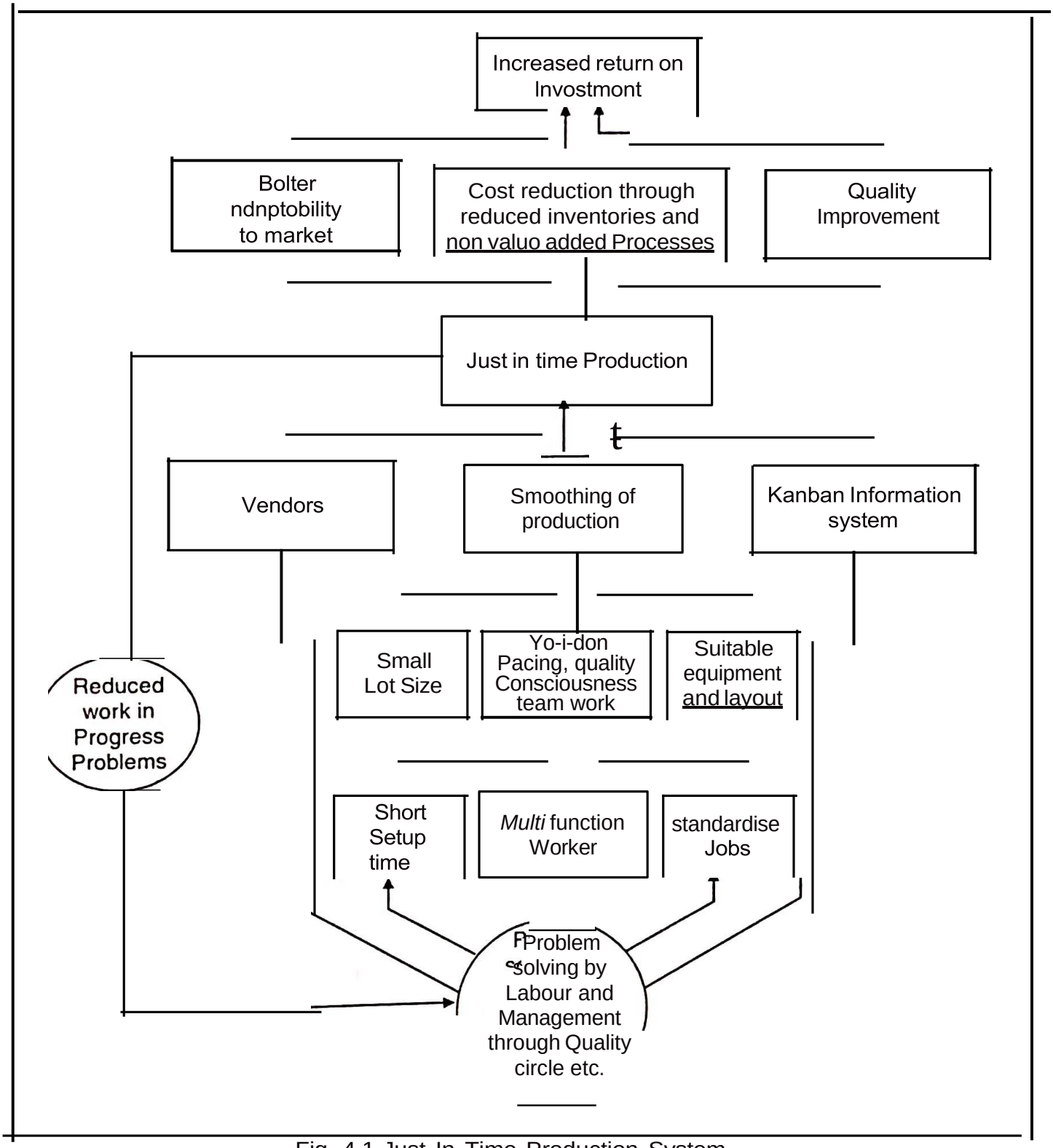

Fig. 4.1 Just In Time Production System

Flow Manufacturing

In flow manufacturing the work flow from one work-station to the next at a relatively constant rate and often with some materials handling system to move the product. The Just In Time Concept was developed by Companies such as Toyota. These Companies manufacture goods 1n a repetitive manufacturing environment.

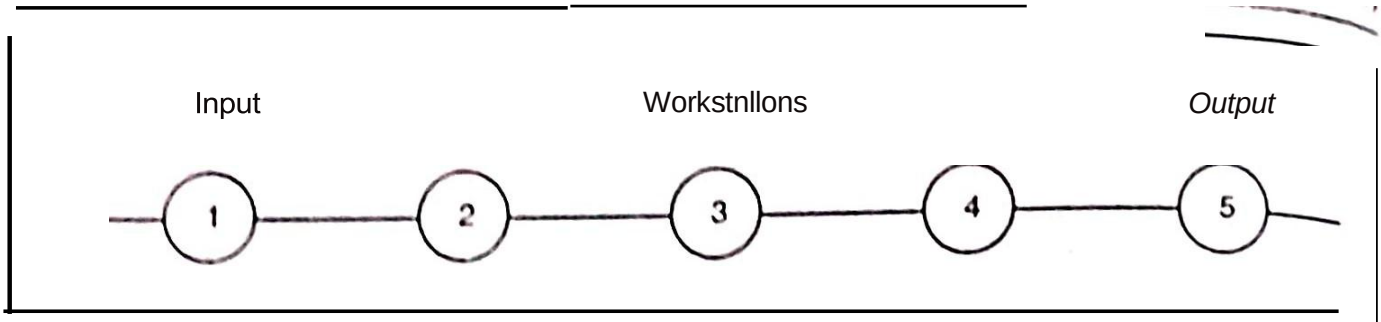

Fig. 4.2 Flow monufacturlng.

Th<" product cntC'rs from ono workstn ion, 1novcs through the different work tationR to ncid upon their vnln<'S nnd tinnily the finished product in the form nf output i rec inxl at tho othrr ond.

As thL' work tntion nrC' nrrnngcd in tho sequence, the systcn1 is not suitable for tlw variety of diffcn,nt products. This type of system is generally useful for limited rnn o of similnr products like nutomobilc, television or micrmvaye o\'cI\ I"'tC.

Some companies do not hnvo sufficient volume of specific parts to justify etting up of n line. Compnnics with this kind of product line usually organize their production on n functional bnsis by grouping together similar or identical operations (Fig. 4.3)

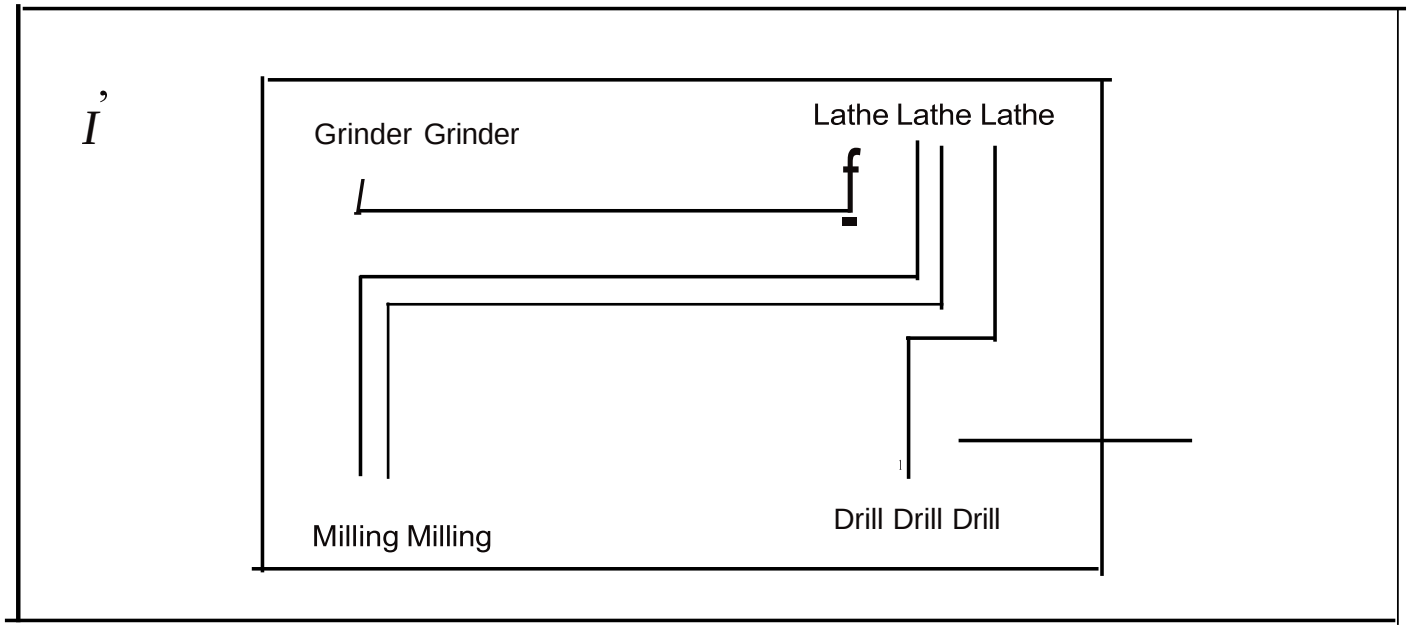

Fig. 4.3 Functional Layout

Product moves fron1 one workstation to tho other in lots or batches. In functional lnyout tho machines nre grouped together like lathe machine ns well Drilling and milling machines are grouped together. This type of Lnyout hus generally long quouos, high work-in-progress inventory, long lead time nnd considerable mntcriol handling.

This kind of l?yout can be imp vod. It can be effectively done by grouping products together mto product fomthos. Products will be in the some fomily.

if_t!iey use common workflow or routing, materials, tooling, set up procedures and cycle time. Work-station••cu then be set up in miniature flow lines or work cells. This type of layout is culled work cell layout.

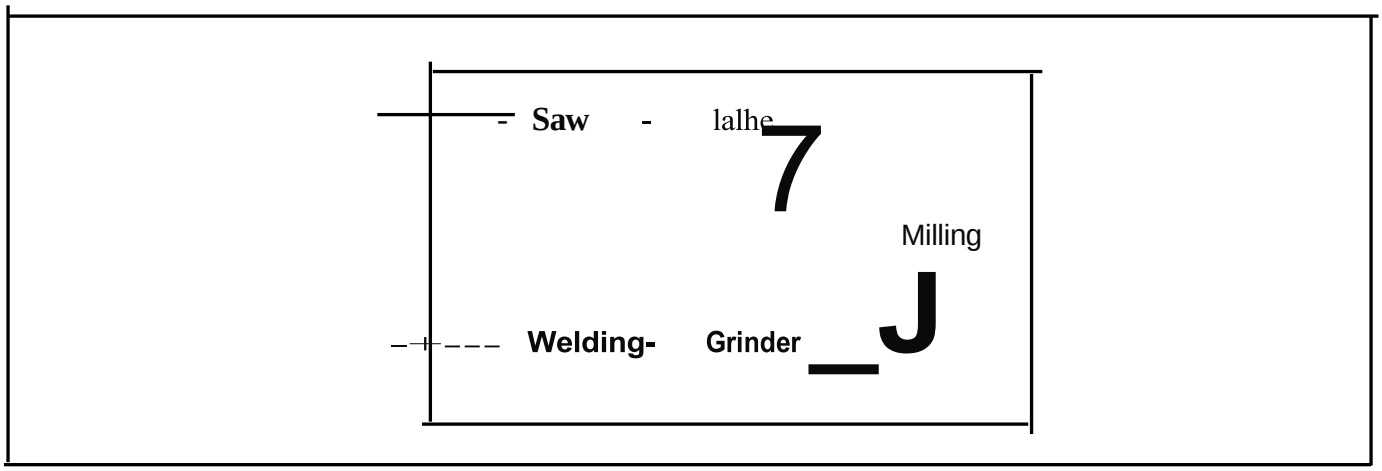

Fig. 4.4 Work Cell Layout.

Work Cell Layout has several benefits.

1. Queue and lead times going through cells are reduced drastically.
2. Floor space needed is reduced.
3. Feedback to preceding operations is immediate. Quality problems can be sorted out immediately.

Work cell layout permits high variety and low volume manufacturing. For work·cells to be really effective, product design and process design must work tog tber. That is why parts are designed for manufacture in work cells.

This type of manufacturing is also called cellular manufacturing.

Process Flexibility

For the effective implementation of JITthe flexibilities are required in the following categories :

(i) **Process Flexibility.** It is required so that company can react swiftly to changes in the volume and mix of their products.

(ii) **Machine Flexibility.** Machine flexibility should be there so that the product can be manufactured on different machines. Rather than having big special purpose machine smaller generalized machines can be used for manufacturing.

(iii) **Quick changeover. Quick changeover requires short set up times.** It **results in the following advantages** :

(a) Reduced econom_ic and quality. Economic lot size depends upon the set up cost. If set up time can be reduced, the lot size can be reduced. The general opinion is that the set up can be cut 50% by organizing the work and having the right tools and fixtures available when needed. In the Toyota·-

Th' hen fiL-; of the good quulity pronrnm nro Jos1:,1;crop, lc!is rework, less itwcnto , better on limo production, limoly dolivorioH und more sotisfiod cust mt'r .

TOTAL PRODUCTIVE MAINTENANCE

Trndit ionnll ' tho mninlonnnco is gcncrnlly 'breakdown mointennnco' which implies tlw mnintcnunco is dono only if tho mochino hos brokon down.

Th brcnkdown of n mnchino results in wenr and poor performance. *e.g.* if you nr going by n cnr on n journey, and your cnr breaks down. The breakdown of cur results in trouble inconvenience and delay in the programme.

For n process to continue to produce the required quality, machinery should be mnintnined in excellent condition. This can be achieved through a program of preYentive maintenance. Low work in process inventories means there is little buffer available as required in the system of JIT. If a machine breaks down it will quickly affect other work centres. **According to APICS Dictionary, total productive maintenance is "preventive maintenance plus continuing efforts to adapt, modify and refine equipment to increase flexibility, reduce material handling and promote continuous flow.** JIT emphasizes the principle of eliminating waste.

UNINTERRUPTED FLOW

Ideally the material should flow smoothly from one operation to the next ·with no delays. This holds good in the product line where variety is limited. Several conditions are needed to achieve uninterrupted flow of materials :

Uniform plant loading, a pull system, valid schedules and linearity.

(a) Uniform Plant Loading. It means that the work done at each workstation should take about the same time. This is called balancing the line which means, that the time taken to perform various operations and tasks at each workstations on the line in the same or approximately same.

(b) **Pull system.** Demand on a workstation should come from the next workstation. The pull system starts at the end of the line and pulls product from the preceding operations as needed. The preceding operations does not produce anything unless a signal is sent from the following operations to do so.'

The most well known system is the Kanban system. It is basically a two bin system. Fixed order quantity and order point system. A sn1all inventory of parts is held at the user operation - *e.g.* two containers (bins) of parts. When one bin ia used up, it is sent bpck to the supplier operation and is the signal for the supplier operation to make a contniner of parts. The container is u standard size and ho]d a fixed number of parts (order quantity). This system also make the counting and control of WIP quite easy. It is n physical control

system and is visual in nature which is an advantage over the conventional production control paper work which is quite confusing sometimes. As clear from the figure the Withdrawl Kanban (WK) Card and production ordering Kanban (POK) card keep shuffiing back and forth. Whenever withdrawals takes place from a work centre, the POKs from the full containers are removed and replaced from \VKs.

The POKs indicate that much of production output from the process (Work Centre). They are picked up from their collection posts, the designed production quantity is manufacturing and POKs are returned tagged to the respective (Full Containers) once again. The WK, which accompanies the withdraw} container proceeding to the next production process, is again returned to the WK post when containers get empty. When the material is to be drawn from proceeding process, the WKs are collected along with empty containers and cycle starts a fresh.

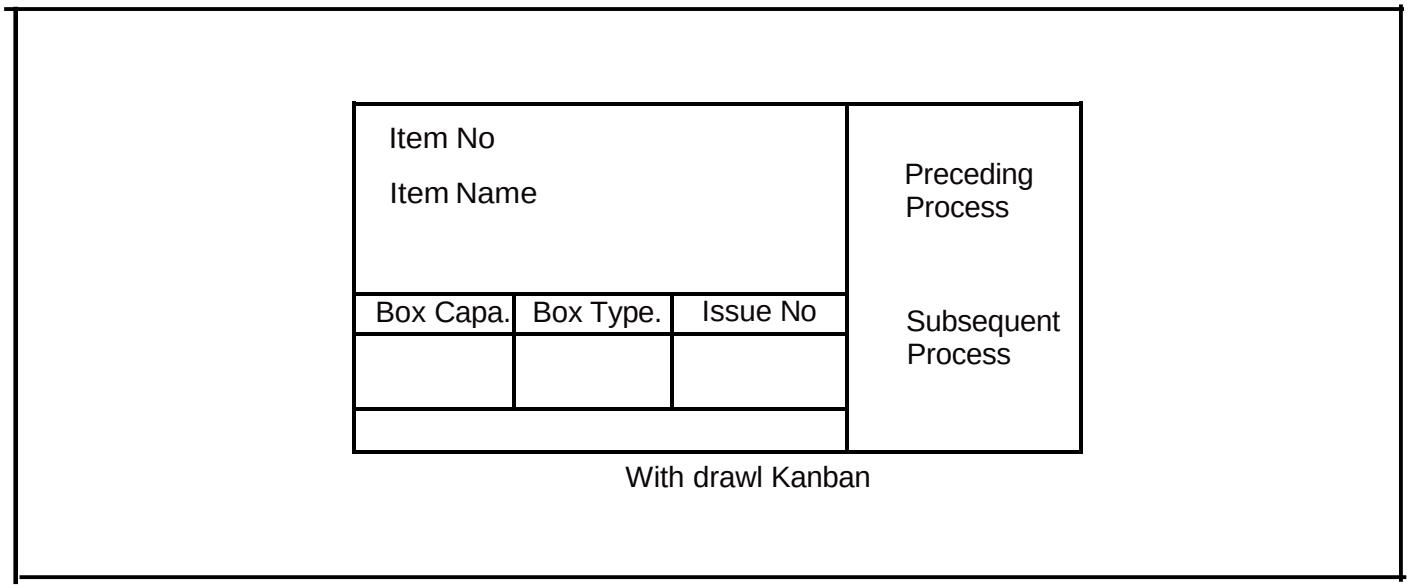

Fig. 4.6. Withdrwal Kanban

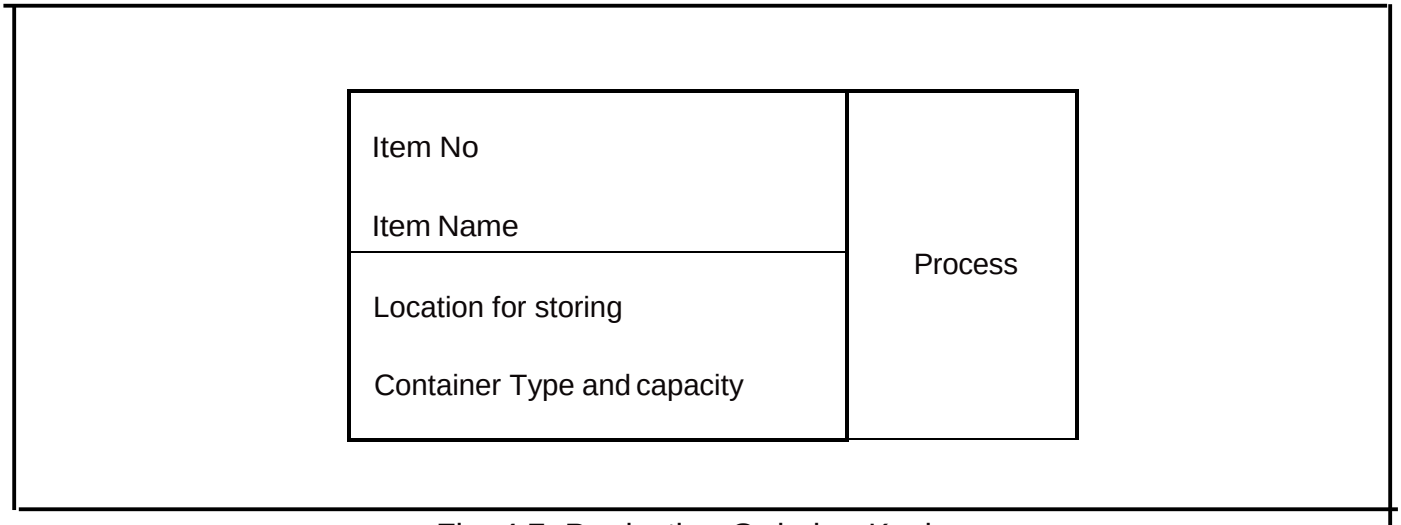

Fig. 4.7. Production Ordering Kanban

Everyone inthe work force muAi be given opportunity to improve the process they work with.

'fcnins. Continuous Process Improvement needs team work. A team is a group of people working together to achieve common goods and objectives. The members of the temn should bo all those who nre involved in the process.

VENDOR DEVELOPMENT

If n organization is to develop a Jl1' and to maintain the schedule, it is very important to have good, reliable suppliers. They are responsible for the supply of raw material, semi-finished and finished material to the factory.

JIT philosophy put much emphasis not only on supplier performance but also on supplier relations. Suppliers are looked on as co-producers. The relationship with them should be one of mutual trust and co-operation.

Tho key factors in partnering

1. Long-term Commitment.
2. Mutual Trust.
3. Shared Vision.

As already discussed the Maruti has 11 vendors or suppliers. They are the duster of Maruti which supplies quality materials and products to Maruti. As a result of quality policies implemented, they have won even the Deming quality prize.

TOTAL EMPLOYEE INVOLVEMENT

A successful JIT environment can be achieved only with the co-operation and involvement of everyone in the organization. The idea of elimination of waste and continuous improvement that are central to the JIT philosophy can only be accomplished th ough people co-operation and involvement in the system.

Instead of being receivers of orders, operators must take responsibility for improving process, controlling equipments, correcting deviations and becoming vehicles for continuous improvement. In a JIT environment, more emphasis is placed on the leadership role. Managers and supervisors must become coaches and trainers, develop the capability of employees, and provide co-ordination and leadership for improvements.

BENEFITS OF JIT SYSTEM

Some of the important benefits of JIT are as follows :

1. Reduced inventory. The implementation of JIT results in drastic reduction of raw material, work in progress inventory, finished goods inventories.

2. Reduced time. The implementation of JIT system results in reduced time for products to get through the factory.

The use of JIT involves some problems that are worth noting. They are given below :

1. **Expensive.** JIT implementation is quite expensive. The complete layout of the organization has to be changed accordingly. The employees have to be fully educated and trained.
2. **T,rust and Cooperation.** JIT is based on the pillars of co-operation di_scipline and trust between workers, management and supplier.
3. **Discipline.** JIT implementation needs a high degree of commitment discipline from the management, workforce and supplier. If product don't arrive in time or if some defects occur, production will stop. This results in the failure of JIT system.
4. **Repetitive Production.** JIT is applicable to repetitive production involving relatively standard products. It requires frequent set ups, shipment and receipts.
5. **Excessive Pressure.** The tight schedules, low inventory, very high quality leads to excessive pressure on workforce, supervisors and suppliers.
6. **Unclear Vision.** Many Companies thinks JIT concept as cutting inventory. By this concept they cut inventory to the point that it causes more harm than good.
7. **Poor Planning.** The poor planning and strategy of the implementut on of JIT results in mismanagement in the organization. This results in poor quality, wastage of time and customer dissatisfaction.

DIFFERENCE BETWEEN JIT AND MRP

JIT is many times compared to Material Requirement Planning (MRP), perhaps because both lay emphasis on the question 'When is a material required'? Both these system are used for different types of demands. The MRP can be used for dynamic situation; that is, when the demand level changes abruptly in future. JIT is in capable of taking large and sudden variation. JIT is basically a repetitive manufacturing system. JIT is a single unit production whereas MRP involves lot sizes at all levels of the product. JIT eliminates inventories in no way comparable to rather limited MRP intentions. MRP keep some safety stocks to insure against demand and supply variation.

MRP does not require human orientation as a pre-requisite in JIT. In MRP there is not much stress on the supplier, but in JIT there is lot of strez[5] on the supplier. MRP can work with all the conventional beliefs about a[nd] approaches to people, whereas JIT system require radical re-orientation in th[e]

approa ch to p e l wit • hin and outs ide the company. JIT tries to make the ideal of no mventones whereas :AIRP is interested in low levels of in\"en ories. JIT bothered a lot on quality butIRP haE nothing t-0 do with quality.

in **Services.** The J1Tphilosophy also can be applied to the production of services. The speed is an important factor in service. The focus of JIT in service is on the time needed to provide a service. **JIT is beneficial in** services **if _ope:ations are repetitive and have reasonable high volume and deal ,nth items such as pizza deliveries, mails etc.**

The focus is on improving the process. Some of the concepts of JIT are as follows :

1. **High Quality Service.** Theemployees of the organiz tion can be taught the value of providing defect free service. Some of the example are providing pizza delivery in a city within stipulated time.
2. **Automation.** Automation can play a vital role in providing Just-in-time service *e.g.* AThl of any bank that provide facility of trnn action anywhere, anytime.
3. **Flexible Workforce.** Flexible workforce can improve the JIT rv1c a lot. It requires multi-skilled workforce.
4. Standardized Work l\lethods. Highly r petitive source op ration, high efficiencies can be acrueved by analyzing work method and standardising improvement for all employees to u .
5. Preventive Maintenance. A thorough maintenance i r quir d for the machines so that they can provide JIT ervice to customer.
6. **Eliminating Waste Time.**.Managers of service operation can r cogniz their employee and equipment to provide uniform flow through th system and eliminate the waste time.
7. **Reducing Paper Work.** The JIT service can be achieved by minimizing the paper work in the system and by making it user friendly.

The JIT plays a major role in service sector. The JIT approach can be realized in our daily life. You can very easily enquire and book your railway tickets on line at your personal computer instead of waiting in queue at railway stations.

You can order your Pizz.a through Telephone and withln few minutes the pizza is available at your home.

The courier service is an another example of JIT service.

Thus JIT is not only applicable and important in manufacturing sector but it is also very much applicable in service sector.

CUSTOMER FOCUS

Learning Objec ive

After reading this chapter, The readers will be able to answer the following question

- > Customer
- > Customer and quality
- > Customer Satisfaction
- > Expectations of customer
- > Data Gathering techniques
- > Customer complaints and redressal mechanism.

Introduction

'The rore of a total quality organization can be described in just one, simple phrase "Evezyo is vehemently committed to serving their · respective customers". Being customer oriented implies that an organization is clear about who are its customers at every level and stage of the process and armed with this information, energeti. al strives to rovide more an more value to them.

To demonstrate the 1mpoita e of bemg customer onented, and to indicate what needs to be in place for an organization to operationalize this basic requirement of total quality. World_class o ganizations are obsessed with meeting and exceeding customer expectat10ns. It t's....necessary that the firms have to learn to be customer focussed, often in respoi't to competitive crisis.

Seeking customer satisfaction is one of the grea't<:t>ncepts ofTQM. According to Jeol Ross "Quality Begins and Ends with customer". ln **today competitive**

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1' t ,I quolity L n lm inl' strntogy in thnt it Rhow tomnnogcn:i how t I nt within bu. iness by fo •ussintt on customurs. AH n1usi_noss strutcgy, frot:,l 1t1, tity fr u o fir. t nnd fon,rnoHt on consistently sut1sfying customer" . nd t hctr n<' d.. 11,, primnry focus is tho customer and not the competitor, n. ,n th(' n. I' f mp tiliv, strutcgy. This is n mnjor mind-set difference t" <'ll ust ml'r \'nlu strnt gy nnd competitive strategy. By delivering u n r ,·nlue to custom rs, tho competitors arc loft in the dust.

R b rt Gnh-in wns tho chnirmnn of Motorola when it won a prestigious {al ln1 Dnldrigc Nntionnl Quality Award. He seemed to understand the t.'"ntr. lity f customers to tho success of Motorola. Inn description of Motorola's . tr t ·, Gnh·in described Motorola's foremost goal of total customer satisfaction.

Customer

A u tomcr can be defined as "One who purchases a product or service."

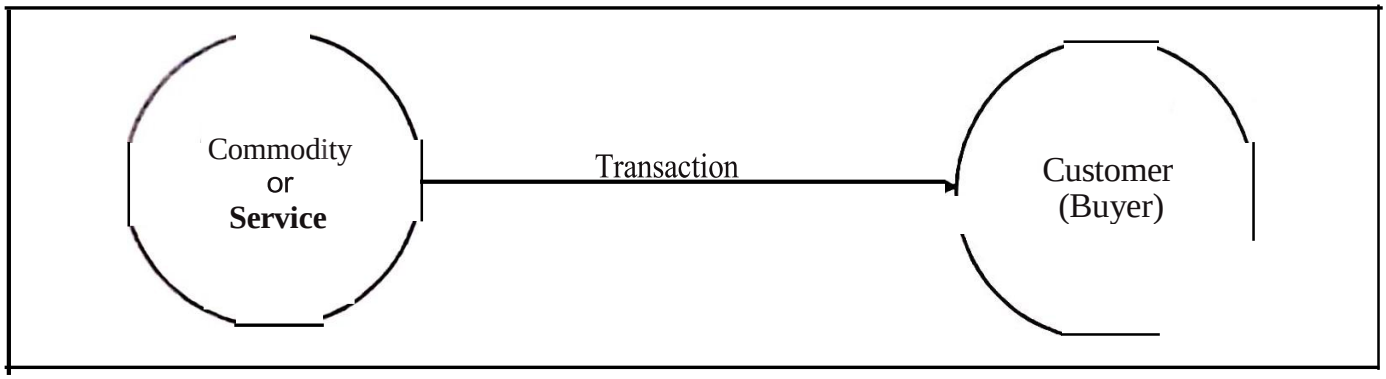


Fig. 5.1. Traditional supplier-customer concept.

The above model of the customer is not complete from a approach of TQM. This approach is related to only the external customer who exists outside the organization and buys the organization's products or services.

Customer is nnyonc who is impiusted by the product or process. The three categories of customers arc :

I. **External customer.** These are the customers who exists outside the organization and buys the orgt1nization's products or services.

2. Internal customer. An another important category of the stomcr is t he. int.emol cus tomer. Every function in the organizat1·0n w e thcu r 1·t is mar ct1ng, engmcenng, production.or purchasing has an internal customer. Each

d pnrt 1cnt recicvcs som product or services and in exchange provides a product or serv_ico. Every person. in n process is considered us*a* customer of the preceding opcr:ntwn. E lch preceding department worker's goul is to ensure the quality of lus opornt on so ns to meet the stnndurd of his customer *e.g.* manufacturing department. [18]n customer of design development section. The design section hns to design n product in such a way that the customer (manufacturing department) feel satisfied by the design. The method required is easy to bring thut design into reality.

These include all functions impacted by the product at both the managerial und work force levels.

3. Suppliers as customers. Supplier should be viewed as extensions of internal customer department such as manufacturing.

Customer/Supplier chain

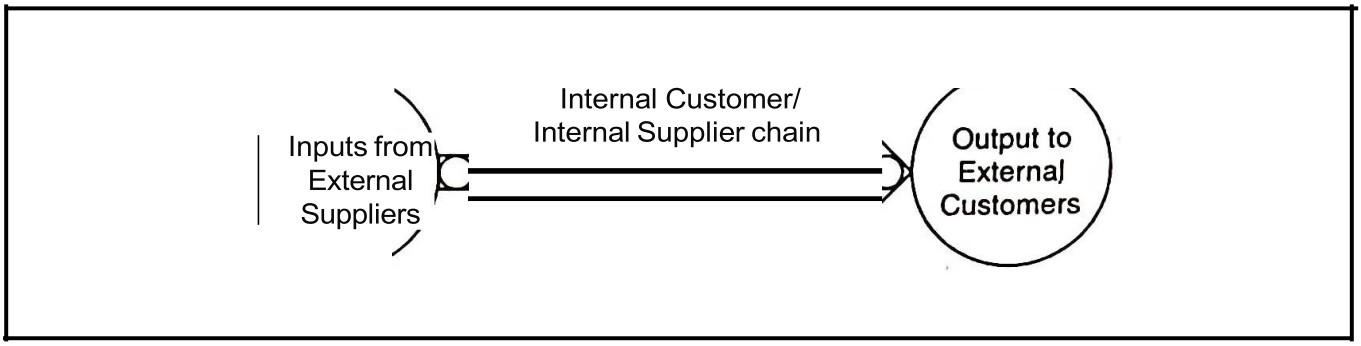


Fig. 5.2. Customer/Supller Chain.

Requirement of Customers (Internal and External)

The requirement of customers are as follows :

1. High quality. Customer needs a process, product or services which is of highest quality.

2. Low cost. Customer wants to minimize amount of cost for a product or service with a high quality.

3. Quick Response. Customer needs a product or service with a quick response (speed). Customer needs a product or service without delay. The supplier has to provide the service or product with minimum of lead time, so that it can make available number of wide range of products in a shortest possible time to its customer.

4. Low variation. The customer needs zero deviation or variation from the targetted or expected results.

5. Low maintenance. Customer needs a product which needs minimum maintenance and that too easy and cheap availability.

6. Good Service. Customer needs hi!rh level of service from the supplier of the product.

fl .· '!: **Flcxibll_lty.** Customer admires n product nnd organization whic oxibihty to snt1sfy tho custmner ns per chan!,ring needs. . ,ave

Tho nbovo 1nontioned requirements are some of the basic requirern of the cuRton1cr which the supplier or manufacture has to fulfil to satisfy :hrit custmnor. e

Customer Satisfaction

Custmncr do not buy product or services solely on the basis of price. Custorn satisfaction cnn be achieved only when the product and services meet or exce: tho custmncr expectations.

Tho objectives of any business organization are :

1. to satisfy the customers.
2. to offer high quality product at minimum cost.
3. to retain the customer in long run.
4. to gain a market share.
5. to in1prove the image of organization in the competitive world.

Measuring Customer Satisfaction

Custon1er is vital to any organization. The long-t rm association with a cust01ner is in1portant for the organization. Feedbacks or surveys are generally conducted by the organization to learn how satisfied its customers are ·with • the products or sometimes, suggestions come f the customer and the feasible ·suggestions are generally implemented to redesign the product to satisfy the customer.

The measure of customer satisfaction is very important which helps **the business in the following ways** :

1. Rediscovering how well the organisation is fulfilling the customer's need.
2. Compare the competitor's performance.
3. Helps in improvement of the design of products.
4. It extracts new ideas which can be useful for the business in the coming furture.
5. It improves the image of the business enterprise that it is customer caring. Occasionaly we find number of surveys going on depending upon the product's performance. The Yamaha Motor India Launched its 4 stroke motorcycle Libero with a capacity of 106cc and witha mileage of 90 km/litre. After launching the product, the company did not get response from the customer. They conducted surveys about that bike. The Survey concluded that the people didn't like the multireflector head-light. The Yamaha company redesigned the product. 'The bike is now available in the market with the traditional round shaped headlight. Thus the surveys and feedbacks generally helps in improvement of product so that its customers should feel satisfied.

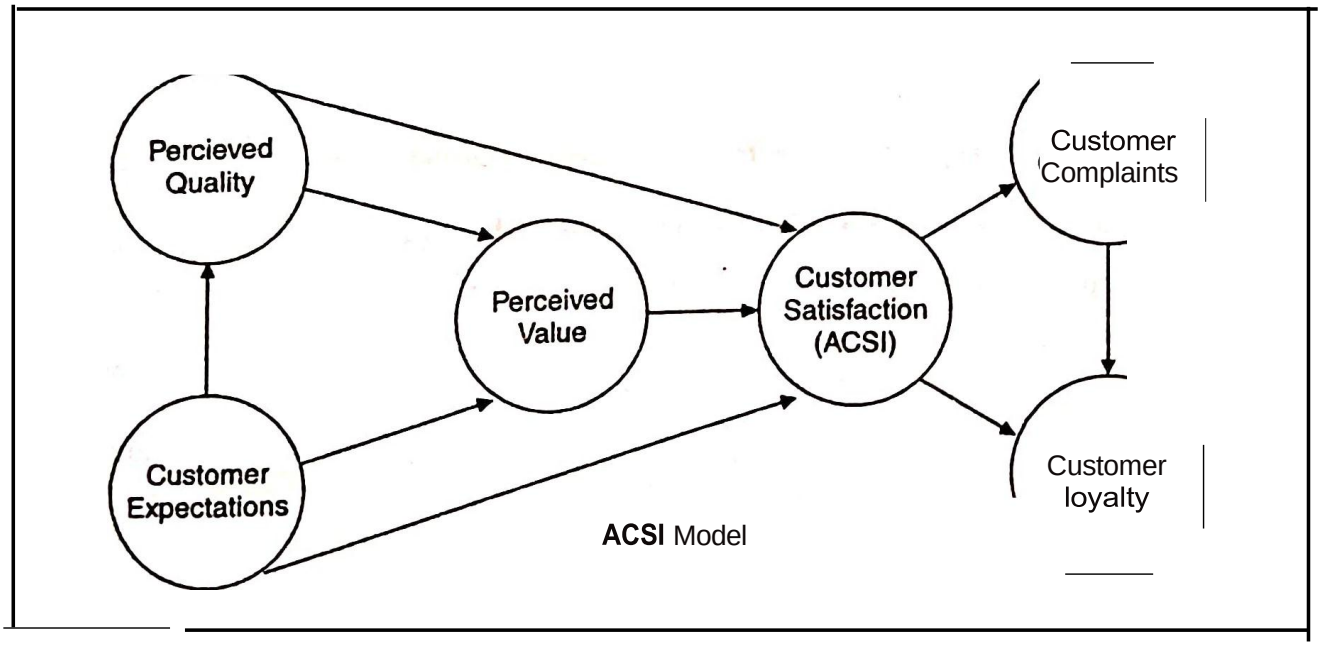
Importance of Customer Satisfaction

AsdC'scribcd earlier, the customer plays a very important role in the success of nny bu iness enterprise. Customer sntisfaction can only be achieved when t.he products ond services meet or exceed customer expectations. Customer satisfaction results in increased profit. The satisfied customer will improve tht:3nwge of the business enterprise and thus the business will grow. Consumers do not. buy products or service solely on the basis of price. The consumer wants return on the price which he has paid. Consumer needs a good quality product. They oflen compare the total package of products and services that a business offers with competitive offerings. Consumer wants a good quality product at a lower price. A satisfied customer purchase more and are willing to pay higher prices. A study have revealed that it costs more than five times to attract new customers than to keep old one. So it is very clear that instead of going for new customers, the business enterprise should try to satisfy the old customers. **The old satisfied customers are an asset to the organization.**

Sir Richard Green Bury, Chairman M·arks and Spencer stressed on the customer satisfaction and importance and said that **"We do not need financed pundits to tell us how to run our business, we have customer who tell us."**

Customer Satisfaction Index

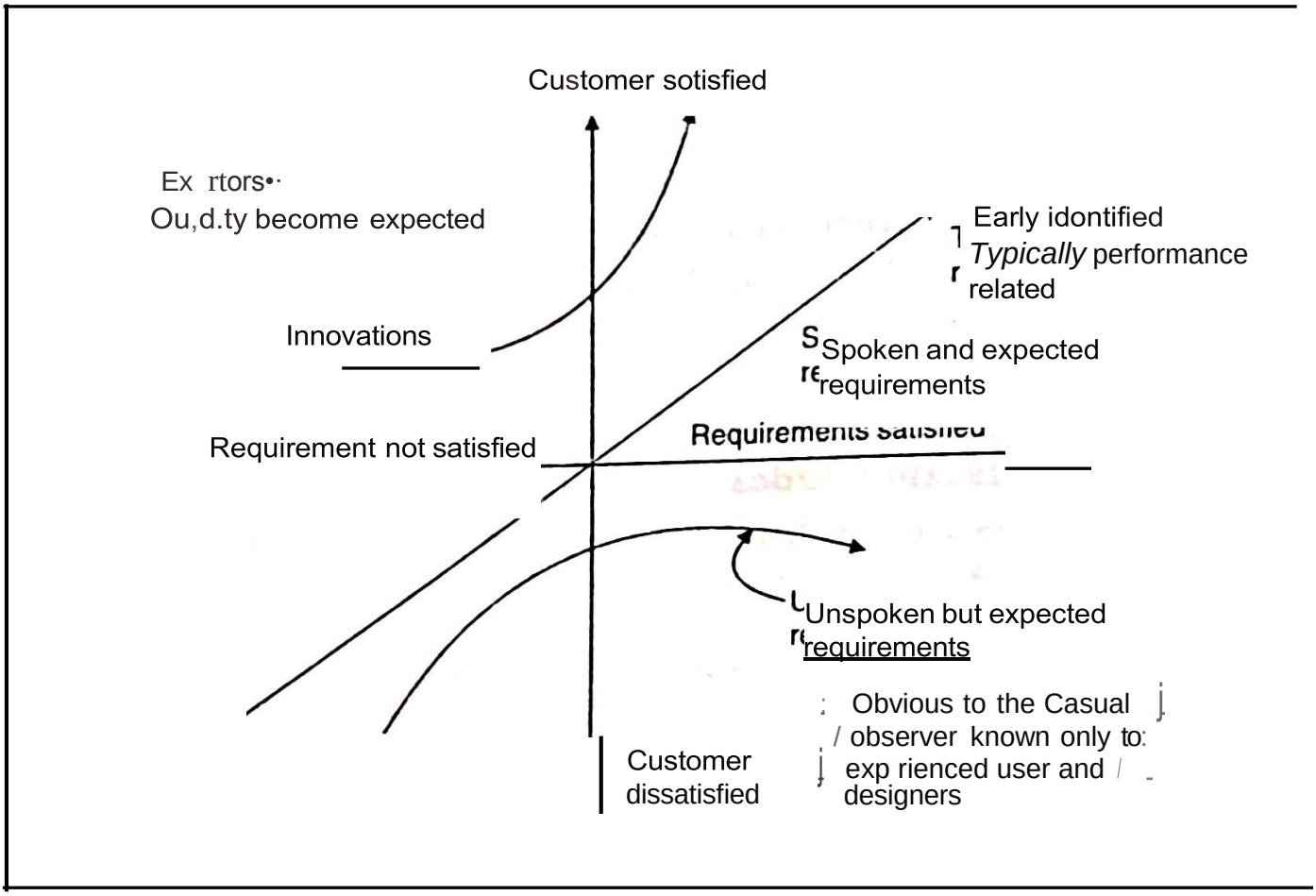
American society for quality control released the first American customer satisfaction Index (ACSI), a new economic indicator that measures customer satisfaction at National level. The ACSI is based on customer evaluation of quality of goods and services purchased in US and produced in domestic and foreign firms.



ACSI Model

It is clear frotn the mo<IC'l that llw cuslomcr cxpnc ation Mets t e quu1i stnndnrd. Th rustomcr • are v r.,• importnnt to on bu Jncss entcrpnB . *lr* l}l --u t0111er 1.·pcct ,lions trC' ntiQfit>cl in term of qunlity of product UndPri nd th i ropl'r , u tomer omplnint arP rvdressed, the customer loyaJt,y U(' nchic,·L' l. Th rlnlionship lJl'twccn the supp]icr and cu[st]omer wj]] beef) 1 ngt nn.

Kano·s Model of Customer Satisfaction



Ag. 5.4. Kano's Model of Customer Satisfaction.

Product features can be classified into

1. Basic features.
2. Performance features.
3. Excitment features.

Bac;ic features which customer expect to have in a product or service will not result in customer satisfaction. Performance features are typically spok n by customers. Satisfaction level is enhanced when product performance l: better than expected. Excitement features are those features that customer do not normally expect such as extra function.3 and convenience features. Excitement features m:ikes the product pleasantly unique to the customers. This represent= added value to the customers with little or no extra preceived cost.

1;he model. represent three areas of customer satisfaction. The first are is epicted by diagonal_ line, representing explicit requirements. These include wntten or verbal reqmremEnts and are easily identified, expected to be me and typically performance related.

Th second area of customEr satisfaction :-epresents innovation, hown by cu ed l n .A cu to er's written in. tructions are often purposefully vngue to avoid Hhfling new 1dPas during C">nceptualis tion nnd product definition. As these are unexpected, the:::e crealiYe ideas often excite and delight th customer.

The third and most t1ignificant area of cu tomer satisfaction rcprc ent unstated or unPpoken requirements a hO\ n by lower curve. The cu tamer are generally unaware of them or may assume that uch requircmen ,,;11be automatically provided.

Customer Satisfaction Performance Measures

Many compnnie such a TEL 0, TV. . Moruti Udyo tc. r u. mg the sequence of cu tomcr cmti fact ion p rformnnc m o ur .

The customer sntisfaction model cun be designed combining th following pcrforn1ancc mcasurcR :

1. Product reliability. Cu1=tomc_r's urv y c n collrct comp titiv data on pcrccm L defectives on urriva) and ·r nl. nnnunl fo.ilurc rate.

2. Ensc of use. Cu ·tom r 111-v ·y cnn coll d ta on confusion roting and competitive data.

3. Environment friendly products. Now-o-d y the consumer i much more awnrc on the products which nr nvironmcnt.al fri ndly. R cyclnbl porls nnd consumer agency approval data cnn Ix- collected and pcrformanc i m osur d.

4. Euso of avnilnbilty to dealers nnd rctaHcrs. Cu tom r urv y can lead to the important information *re* arding c of availability to d ol r and retailers.

6. **Documentation.** Customer surv y , competitive data, cu tom r h lplin , and manual re. ponse cords etc. hos to be documented.

6. Price und cost of o\,·nership. Repair cost, competititve dala cost and customer survey cost moy be men urP<l.

7. After soles sen·ice. The cxt nt to which after sales, is made avail11bl on hot site , and·repair time are mea ured.

8. Functionality and performance. Cu tomer survey VI.ill help to involv competitive dnta, focus groups, product te ting and cu tomer defect tracking Which can be mea ured.

9. Customer complaints and feedback. Customer survey wilJ h Ip to colJect data regarding complamt type, num r, comparison to similar produc and pride of owner hip.

Victory-C TQM Model

Leadership is required to crcl1te n TQM frnmowork focus d 011 totnl cuRt snlisfnct.ion t.hnt fo!-:lcr ntJninmcn!. of victory. ThiR it:1cnllod Viclorv-C ¡t\t 111 <:t All thelemont.c.of this modol ar cs ontiul with tho nim of uchi vin.g c ui-i 00 t:1. focus. Cu tomcr focus is the centrnl clomcnt of this model. Custom rti Hr snt1•sfied if t.hcsc requ•irements are consrntont[y m e t . 'l,Ql\1 p1·ov1'd o orgnr iz11 u focus and mind set to ensure meoling customer reqmrcmcnts.

The first step in ochiovinr, cm,tomer focus is to ublo to go well boyo nd asking the customer to anticipntc future-needs and desire of tho custorncr.

Secondly continually monitoring of customer satisfaction, customer foedbnck nnd pnrticipation in the procesi:- is es cntinl.

Thirdly, mnnngcmcnt must ensure that everybody should know their customer.

The above mentioned three principles will greatly help to uchieve customer focus.

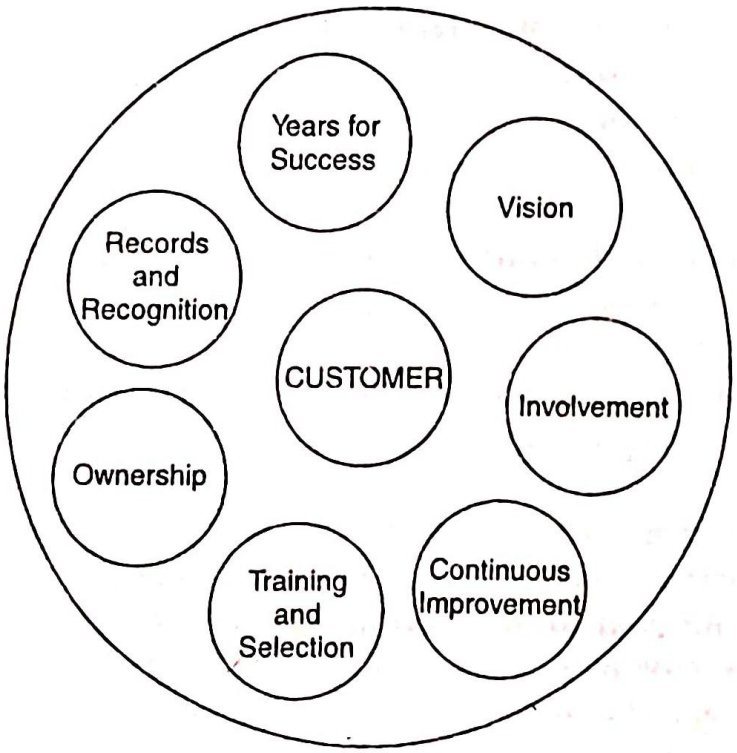


Fig. 5.5. Victory-model

Expectations of Cu tomers

AB **essential part of customer satisfaction occurs after sales,** The **various characteristics and expectations include** :

Characteristics.	Expectations
t. Delivery	Product should be delivered *in* time and in undamaged condition.
2. \Varranty	Clearly stated with prompt service when required.
3. Field repair	Trained staff for quality repair.
4. Use	Clear instrudions and user manual to operate and handle he product.
5. Installation	'l'raincd staff should come at installation point to give instructions.

Customer and Quality

One of the basic concepts of TQM is continuous improvement and zez:o defect approach. This concept in1p]ies that there is no acceptable quality 1eve1. For customer, quality is the top priority. An American Society for quality control surveyed custon1ers and find the important factors influencing the purchasing.

These factors are listed as per their i:rtiportance :

1. Performance. It indicates that product or services is ready for customer's use as and when required performance involves "Fitness for use".

2. Features. Features of products or services are psychological time-oriented, contractual, ethical and technoTogicaL -Customers carefully view these features to buy the product.

3. Service. Good service has become the landmark of organizations. These give customer extra-satisfaction. Providing excellent customer service is different from and more difficult to achieve than excellent product quality.

4. Warranty. It is a guarenteed level of service or quality that organizations promise to its customers for a particular time period. Warranty helps in building markets. Warranty forces the organization to foc_us on customer.

5. Price. Price is an another important factor. Customers are willing to spend rnore for a good quality product.

6. Reputation. Total customer satisfaction is achieved from the past history of organization not just from product. Customer often go for brand name and become life Jong buyers. For example Adidas, NikE!, Reebok are Int rnational brand name in clothing and shoes. People generally prefer these brands because of the reputation of company.

Effective Data Gathering

Gathering data about customer satisfaction is very important for organization for further improvement of product and services.

Step 1. 'l'he first step in obtaining data for organization is to identify "Who are customers". Customers can be current, prospective or lost customers.

It is_ sent on qunrtorly bnsis. The other methods include, first report, utilizing services of nrnrkct resenrch organization, contact *review* etc.

Customer complaints

A dissatisfied cnstonrnr can easily become a lost customer. Many organizations use customer dissatisfaction as primary measures to assess process i1nprove1nent efforts. Research studies indicate that more than half of dissatisfied cust01ner goods if they believe that their complaints has been heard and resolved. Only one-fifth ,vill buy agnin if their c·omplaints being heard but not resolved. Fewer than one-tenth "ivill be repeater buyer when complaints not reach the organisation's management.

Small organizations are at added advantage as they are in personal contact ,vit.h every cust01ners. An organization can save customer by training front-line employees. Customer focus and listening skills are not easily learned. Front-line people must be trained to deal with custome·r. Front-line people know better than management regarding the need of their customer. Management should motivate their employees to resolve customer problem.

Few key points which an organization should take into consideration regarding customer complaints.

1. Complaints should be collecteq from all sources *i.e.* letters, meetingc_;, survey, phone etc.
2. Data should be collected via a customer complaint and feedback form and a formal corrective action request form must be used.
3. Complaints should be resolved at customers site mUBt be resolved as quickly as possible.
4. Complaints should preferably be resolved at customer's site.
5. If it is not feasible to solve the complaint locally then it should be immediately referred to the central co-ordinator or analyst level who will further analyze the issue and propose a solution.
6. The data must be analyzed on regular basis and systematic issues must be identified, resolved and eliminated. Otherwise the customer's will not feel satisfied and may result in lost business-and market share.
7. Performance measure must be identified and monitored.
8. There should be regular promotion and facilitation system for constant nurtuirng of complaints.
9. Managers must develop a fool proof c?mplaint management system in their organizations.

Companies like l\faruti Udyog, Hero Honda, 1VS, Eicher, Telco etc. have grown because they care for their customers. Marriot corporation and American Express have installed hot lines to collect customer complaints in US. In Britain, British AirwL!,ys have installed video booths at London's Headthrow Airport

to c_ollect customer compluint.s. The result,can he quantum jump in the cust,>rnr::r sat.tsfaction. One way i$_8$ by doing this i.s to empower Pmployees to make decisions of R1na1l payment on the 8pot to handle dissatisfied customers. The irnpnct of such n decision would be electrifying to cl!stomer and emplnyees.

Consumer Protection

The tonsumer movement is a socio-economic movement that seeks to protect the rights of t.he consumers in relation to the goods purchased and senr1ces aYailed. Government. has uccorded high priority to the programme of consumer protection. The Department of con umer affairs being a nodal department in the field of consume!- protection has initiated a number of steps to promote a respcnsible nnd rerjponsive consumer movement in the country. Such measures include die use of mass-media for promoting consumer awareness und enconrogu g consumers' involvement through governmental and non-governmental org,rniznt iuns etc.

The mah1 objectives of the consumer protection JJrogrnmmc nrc :

(i) To create sujtable administrative and legal mechanisms which would be within the easy reach of consumers.

(ii) Tu involv and motivate various sections of society such as consumer organizations, women and youth to participate in the programme.

(iii) To assist, E:ncourage and provide finnnciol assistance to Government and non-government organizations to take up various consumer protection activities, and

(iv) To generate awareness among consumers about their rights nnd responsibilities, motivate them to dssert their rights and not to compromise on quality and standards of goods and services and seek redressal in consumer courts, wherever required.

The Consumer Protection Act, 1986

The consumer protection Act, 1986 (68 of 1986) is a milestone in the history of socio-economic legislation in the India. It is one of the most progressive and comprehensive pieces of 1egi 1ntion enacted for the protection of consumers. All the provisions of the Consumer Protection Act. 1986 came into force with effect from l.?.1987 throughout the country except in the State of Jammu & Kashmir. The State of Jammu & Kashmir has enacted its own legislation 1n this field.

T1$_1$e Consumer Protectio Act, 1986 is a unique piece of legislation as it provides a separnt_e three-tier quati-judicial consumer dispute redressal machinery at. the nut1onal, stat(: and district level. The Act is intended to

pr<wid ' -in plo, BJ>Cl'dy nnd iuoxporn,ivo rodrmrnnl of tho co111rnmors' griovnnccs. In terms of the Act. the C<mtntl Govnrnmont first cow,tituted the Cnntra] l:cm um• r Prof ••ctiun Co1111cil (CCPC) on 1.(;.1987 und *it* hoA been reconstituted from time to timP. Tho St.nto Govts./UT AdminiRtrotions arc required to cRtnhliPh tJic Consum0r Prot0ctio11 Councils ut the State Jovel as well m; at Di8trict lrvcl. to . trengthcn consumer movomcnt n tho grm,s root JovoJ.

Amendment of Consumer Protection Act, 1986

'l'hc Act. wus nmendod in the yenr 1991 and 1903 to make it more LJffective nnd puqJ11scful. Still, tho ddny in disposal of cuses by the redressal *agencies* ot the district, stnte and national level has been the cause of major concern. Thl.!refor . the Govt. hos amended the Act comprehensively in 2002 through the Consumer Protection (Amendment) Act, 2002 (62 of 2002) which was brought into force from J 5.3.2003. The provisions of the Act mainly aimed at facilitating quicker disposal of complaints, enhancing the capability of redressnl agencies, str ngthcning·them with more powers, streamlining the procedures and widening the srope of the Act to make it more effective and purposeful.

Sect.ion 2(d) of the Consumer Protction Act, 1986, defines 'consumer' as nny person· who :

(i) buy.::i any goods for a consideration which has been paid or promised ()).' partly paid and partly promised, or under any system of deferred pnyment and includes any user of such goods other than the person who buys such goods for .consideration paid or promised or partly paid or portly promised, or under any system of deferred payment when such use is made with the approval of such person, but does not include a person who obtains such goods for resale or for any com_mercial purpose; or

(ii) hires or avails of any services for a consideration which has been paid or promised or partly paid and partly promised, or under any system of deten·ecl payment and includes any beneficiary of such services other than the person who hires or avails of the services for consideration paid or promised, or partly paid and partly promised, or under any system of deferred payments, when such services ,are availed of with the approval the first-mentioned person.

Legal terminoJOl:,1}' apnrt, every human being at some point or other has donnt!d the *role* of consumer in his/her lifespan. When we buy an eJectri appliance for the home, get the monthly ration or buy a brand new car-we become consumers. \\Then we pay some fees to doctor for the medical services provided by him/her, when we pay the telephone bill or when we post a registered I tto.r-we become consumers of the doctor, telephone department and the postal services respectively.

Thus it won]d not be an exaggeration to point out that the n um Prot ction Act, 1986, is one of the most im rtan legislatio?5 that go\·e the hfe of every human being in his transactions with the society for ava_i]i goods and serviceE provided by others. It not only come.s intu daily *us* b prevents the exploitation of common man, the consumer, at the h nds of h affiuent and moneyed business man or service pro\;der. Hence any ch : or amE:ndment whatsoever, in the Act directly affects the common people the e Y needing a close scrutiny of the amendments thereto.

Important Measures taken to Strengthen the Consumer Forums

Being the nodal Department in the field of consumer protection. the Department of Consumer Affairs gives a very high priority for 01 nitoring he functioning of the consumer forums popularly known as consumer cour .

Following are some of the important steps taken by the Central Government (India).

1. Department of Consumer Affairs is periodically *tnk.in* up with the State Govts. and UT Administrations, al the fovcl of hi f!tnr Minister in-charge of Consumer Affi irs/Cbief S«rctnr ,.ere the d!?aling with Consumer Affairs The quc tion o• r n ,th *n n c functioning of the consumer court.a by provid1ng od u to 1nfrw,tructu ond to fiJ) up the vacancies of P idcn f,mbcrs on time. R ·1 meetings with States/UTs ulong with tho **Rcgi.stran** of the N tional and State Commissions are held **periodically**.
2. Functioning of the consumer courts aro rovi '00 from tim t tam under the chninnonehip of o mini.sttt.
3. Consequent upon the Notional Development Council (D) m • **n1**, PJannini: CommiB ion has identified and indudcd • Murru:r A" n·n nnd l{edrcssal and Enforcement of Coruum r Protection Ac-t, 19 r °the one of the items of priority agenda for o.ctjon. amon oth r1, for ion yenr 2003-2004 and osked the Dcpa nt toprepare a N tional t\dl Pinn for the same. The Planning Cornrnis ion WM. tJ1 *ttfa* . pp chr to provide funds *Rs.* 280 crore9 for roruumer prot«tioo. *i.* . for publi t progrnmmcs Rs. 200 crores as well **u Ra. 80 cn>r'P9** to tren h n consumer forums in the Stntes including romputeriz.ntaon n t, o Hs. 11 *crores* for construction of building for **the NatJonaJ** mn 1 10n and — 22 crores to strengthen the St.ate I **boratori** of Lh w a ' and 1neasures during 10th Plan period and also to lh tirn4 for 0 -04, as othenvisc it will not be pos5iblc for the D partm n to 1n1t1ate/formulate meaningfuVworkab)e schemes for gen *r* n *co B er* aw reness and strengthen the cnnsum r *pro or.* activ1bes/machineries nationwide with meager budget of Ra. 3.10 crJr

per nnnurn in tho J 0th Pinn. Planning Commission wus also requested tomode ndoquuto funds avuilublP. in tho State Plans for 1,mooth functioning of consumer forums. SimiJor advice was *given* to all Stntcs/UTs to propose ndcqunte fun<lR in their State Plans.

4. P lrli me \tnr? Stonding Committee on Food, Civil Supp1ies and Public f'i t.nbutton 1n its 22nd Report also reviewed the functioning of consunicr forums and expressed concern over the dispoFwl of cases. The extracts of roport have been forwarded to States/UTs for taking suitable actions at their end. Standing Com1nittee also recommended that unless more funds are allocated by the Planning Commission to the Ministry, it will not be able to tackle the gigantic task of creating awareness among the consumers in the country. This was brought to the notice of Planning Commission where the Department approached t.liern for more funds as stated above.

5. The Consun1er Protection Act, 1986 was amended in the years 1991 and 1993 and subsequently amendments were made in the Consumer protection Rules, 1987. Further, to make the Act more effective, functional, purposeful and particularly to facilitate quicker disposal of complaints by the consumer Forums, the Act has again been amended in 2002.

6. Five meeting1;w re held with the Presidentllvfembers of the National Commission and the Presidents of the State Commissions along with the Secretaries, State Govts. to discuss their problems, review the working of the consumer forum and the utilization of the one time financial assistance released for strengthening the infrastructure of consumer courts in their respective States/UTs.

7. Department of Consumer Affairs has been arranging training for non-judicial Members of the consumer courts at the Indian Institute of Public Administration, New Delhi. 939 Members have been trained so far in 39 training programmes. In addition first course for the Presidents for the District Forums was also conducted during the year in which 28 participated.

8. The Central government, with the approval of Planning Commission, provided *as* a one time financial assistance **of Rs.** 61.80 crores in four installments in the year 1995 to 1999 to the States/UTs to supplement their efforts for strengthening the infrastructure and other facilities of consu1ner forums.

Periodical reports on the unctioning o consum r. co':1rts, pendency position, the progress on lhng of v cancies an ut1hzat10n of one time assistance scheme are being obtained to review the overall position of the functioning of the consumer courts and to take it up \vith the t.ntpq for appropriate action.

10. Thesenior officers also reviewed working of the consumer courts durin their visits *to* States/UTs. Similarly, The Prcs dent, Nationu1 Commission also visits a number of State/UTs to monitor and discuss functioning of con umcr forums in States/U'fs.
11. 6 post . including a post of Joint Registrar, were created in January 2003 in the National Commission for meeting the requirements of scctio 248 of the Consumer Protection Act, 1986 to enable them to effectively monitor the working of the consumer forums. Besides this, based on SIU study report of the Ministry of Finance 18 posts were created in October, 2003 for the National Commission including 6 posts for its additional bench.
12. Additional Bench was setup in National Commission on 24 September, 2003.
13. For the purpose of giving effect to the provisions of the Act, Rules arid Regulations are being finalized by the Central Government.
14. Union TeiTitory of Chandigarh submitted proposal for creation of 35 posts in State Commission and District Forums in 2001. Department of Consumer Affairs requested Ministry of Finance for conducting Work Study in Nov. 2001. On the bais of their report in April, 2003, 13 posts have been sanctioned in October, 2003.

Training Programmes

To educate consumer organizations and other sections of society, the Department has conducted training programmes in the field of consumer protection. The training programmes. is being conducted for non-judicial mmnbers and Presidents of the State Commissions/District Forums. During 2003-2004, seven training courses for non-judicial me1nbers and one for Presidents of consumer forun1s are scheduled. So far, 40 training programmes for non-judicial memberf; have been conducted in which 960 members have been trained. In addition during the year, first time a course for the Presidents of consumer forums was conducted and 28 Presidents participated.

To improve the training above training program this year onward the work relating to assessing the require,=::'!.:nts, selection of participants and course content was entrusted to Nation ··l Commission. These programmes are being conducted in co11aboration with Indian Institute of Public Administration (IIPA), New Delhi.

Swami Vivekananda National Awards on Consumer Protection

'fo encourage voluntary consumer organizations, particularly wome organizations and those functioning in rural, tribal and backward areas, 'Swarn1

Vivekananda National Award fo C - ——————————————— –
Award comprises fi t d r onsumcr protection' has been instituted. The *Rs*. 30,000 respecti: :l ' selcon nd third p ize of Rs. 50,000, Rs. 40,000 and Ya ong with the certificates of merit.

To involve the youth of thi"s conn t ry 1· n pron1oting a strong consumer : oven e; p rticularly at grass root level, the Department has instituteda . wnnu ive ananda National Youth Award for Consumer Protection'. Youth 1n the a6rre group of 15-35years, w l 10 h ave done outstanding work 1n the field of consumer protectio n are e1 i gi "bl e 1 o r t 1e Award. The Award compnses three P:1Z s of Rs. 20,0?0, Rs. 15,000 and Rs. 10,000 along with certificates of merit. Similarly:a Swami Vivekananda National Award for Women has been instituted to reco izewon1en who have done outstanding work in the field of consumer protectrnn. The Award comprises three prizes of Rs. 20,000, Rs. 15,000 and Rs. 10,000 alongwith certificates of merit.

The National Award was named after Swami Vivekananda since 1998. The Swan1i Vivekananda National Awards for the year 2001 were clistributed in the Central Consumer protection Council (CCPC) meeting held in March, 2003.

Publicity Measures

The success of consumer movement mainly depends upon·the level of consumer awareness generated in the country by educating the consumers about their rights and responsibilities coupled with effective functioning of the consumer forums throughout the country where the consumers can ultimately assert their rights in seeking redressal. Where the literacy rate is high and ocial awareness is greater, the consumers can not be easily exploited. Within India, the level of consu1ner awareness varies frmn State to State depending upon the level of literacy and the social awareness of the people.

The Department of Consumer Affairs has been provided with an annual budget of Rs. 3.10 crores during 10th Plan period. Out of this meager budget available the Departn1ent has been taking a number of steps to strengthen consume; movement in the country involving the State Governments, Voluntary consumer organizations, consumer activists, etc.

Some of the important measures taken by the Central Government during the year 2003-04 to generate consumer awareness are given under;

***l.* "Joga Grahak Jago" wee!_dY. radio programme.** Ra io being the ch apest and having widest reach, a lo m1n tes weekly pr?gram e. Jago Gr hak Jag" o 1s e1n • b •g broadcast through 1.10 stat10ns of All India Radio 1n 22 regional languages. To niake the programme popu ar 1 a pnze o . f Rs *t:* • *aOO* per prograinme

NOKIA CUSTMER CARE CASE

'l'her cent developn_1ent of Nokia mobile issued in Aug, 7regarcHng the producidvisor:vofbatteries model BL-GC. '!"hey have jssueda product advisory of batteries (Model BL-5C) manufactured by M.atsushita Battery Industrial Co. Lt.d. (tf J ap n behveen Dec. 2005 and Nov. 2006. Approximately 46 million batteries were manufactured by this company during that Stipulated time period. *Out* of these nun1ber of batteries manufactured only 100 incidents of overheating reported globally. There was also no injuries or no property damage have been reported. Still to safeguard and satisfy the customer alJ around the world, the Nokia company issued a advisory to the battery (model BL-5C) bearing customer to replace the battery with a new model. This act of Nokia company has not only satisfied the customer but also improves the image of the company from the customer point of view. Customer feel much satisfied and protected by this advisory note of the c01npany. Even the customer receive a new model battery at their door step. The above case of the company shows the importance of quality, consumer protection and to safeguard the consumer rights in _the competitive scenario. Though the company has suffered a huge loss, yet to satisfy and protect and retain the customer they have taken such a bold step.

PLANNING PROCESS

Learning·objecti es.

A_fter rea ing this chapter, the redors will be able to answer the follow1ng queries

- > Introduction to Planning.
- > Strategic Quality Planning.
- > Various Quality Policies.
- > Various Steps toStrategic Planning.
- > Hoshin Kanri Concept.
- > Steps of Quality Planning.
- > Various dimensions of Planning.

Introduction

Planning is a key managerial function. It provides the 1neans to cope with a complex, dynamic and ever changing environment. Planning provides a standards and guidelines needed for communicating, co-ordinating and controlling ongoing operations in an organization. Decision-making and planning are closely related. Planning is anticipated decision-making. It is the process of deciding the objective and tactics before the implementation of desired course of action.

Planning is an analytical thought process which covers :

- > Assessment of future.
- > Determination of objectives in light of future.

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Plnnning it un hnportn11t olomout of n11111uuon1ont. It itJ o procoHHof docUHn,r in ndvnnco tho fulu1·0 courttl' of nction. vc,ry toHk or taction ncodH11 good plannfng, A gonl or oluucl1vl cnn·t bo uchiovod until it hi plunnod in o bettor woy. P1unning i on N{ t:'nlinl forN·111u1or of nction. **A p1·0-r"c1ulHlto for CHtublh•hlng 'l'QM is tho nood fo,r,nruful plnnnlng. 'fho Hucco,.,. of uny huHlncH11 cnf.{,rprlH,! dopondt,; upon ;ho plnnnlnac procoHs.** T'lnnning *iH* not only conr.crn<!d wHh only bi1t business ontorpriuo but it iH foromof4t nncJ ceaontiol clement in our dny to dny lifo. Wo plun our cluily routines. lloforc going to Jong journey, planning is dono. Houso Wivo8 gonornlly plnn their hou,whold oxponRoR. StudcntR plan th ir studi s nnd subjoctH. So, it *iR* clonr Urnt not only big corporate houR,:f! but cvon n common mnn needs plnnning nnd Cl eucccRR *f* roaching the objective or gonl doponds upon tho cnrofnl nnd oxh,nrntivo planning.

Plnnning iH **bnsicully u bridging tho gop between tho future** and **present courso of nctlon.**

Control. Tho design of o procedure for nnticipoting ond dotc,ctin ,errors and failures in tho plnn nnd for continuously preventing ond corrcc!ing them.

The vorious definition of plunnlng ore :

:- Plnnning is the thinking process, tho organized foroHight, the vision hosed on fact ond oxporionco thnt is required for intelligent action.
-Alfords B e att y

..,._. Plonning involves tho dovolopmont of forccnst, objectives, policies, procedures, pro(..-rrums, schedules u_nd budgets. **-LouJs. A. Allen**

Plnnning is tho dcaign of desired nnd of offoctivo ways of bringing it about. **-Ack pff,**

RousonH! or PlnnnJng. A fundnmcntnl purpose of planning ie to integrate orgonizntionol efforts is nchioving o common gonl or objective.

Tho vorlousronHonR for plonni ng uro os foJJows :

- ► To 1dontify koy problom nronR.
- >- To idontify now buaincRR opportunities.
- To nnticipnte eurpriaoA and crisis.
- ► To ndnpt to anticipated chnngoe.
- ,- To onhnnco gcmcrntion of now idone.
- > To communicate top management expectation down the line.
- > To improve innovation.
- > To make clear tho vision and mission of organization.
- ► To foster mnnngorinl motivation.

Ja ancse arc considered masters In planning. They put Jot of emphas s and efforts on the planning process. The succeRs of ,Japanese management shows the importance of planning in achieving the desired goal.

$trategic Quality Planning (SQP). It is a structured process for esutbli _hing long range quality goals, at the highest level of the organization and defining the means to be used to reach these goals. It is also known as strategic quality management. It includes quality planning, quality co.nt ol and quality improvement.

It is a structured process for defining the broad mission and strategic goals for the company and then determing the means to be used to reach these goals.

A fundamental step in establishing SQP is the creation of Quality Committee (Quality Council). It consists of the senior managers and senior executive staff. The Quality Committee is responsible to define and in corporate the elements of SQM into company strategic business planning. It has also responsibility to make it ensure that any needed infrastructure is created at subordinate level of organisation.

Planning Process. The planning process is not a easy job. To start with the planning process for TQM, a workshop of senio an agers u t be organised where they can interact and brain storm for dec1d1ng orgamz tional plans.

i,nagers at all level should have co-ordination relationship and

eJ,/ priciples of total Quality.

1. Every employee in the organization must understand the requirement of customer and how these requirements are to be fulfilled.
2. Every body in the organization is clear about his responsibilities and powerR.
3. Customer whether it is internal or external must be stnti fled with good quality.
4. There should be discipline, harmony an co-or re at10ns 1p between the inter departments.

5. Mensures of performance should be agreed upon and understoodb mnnagers.

6. Defects should be avoided. Quality *is* foremost requirement.

SWOT Analysis. For the success of any business enterprise a rar study of business and SWOT analysis mu.st be carried out.

S Strength.

W — Weakness.

0 - Opportunity.

T - Threats.

Wheth?r it is an manufacturing sector _or service sector, the S\VOT analysis must be earned out before starting the planning process. A careful S\VOT analys of any business enterprise has been carried out.

SWOT analysis includes the following factors :

1. S - Strength

(a) Quality.

(b) Customer Satisfaction.

(c) Skilled staff.

(d) Good technology.

(e) ISO 9000 recognition.

(/) Good Companys' image at national level.

2.. W - Wcokncsscs

(a) Site Expansion.

(b) Limited product range.

(c) Lack of foreign language.! **skill.**

(d) Limitation of plant layout.

(c) Resistance of staff.

*8.*0 - **Opportunities**

(a) Capita) Investment.

(b) No\V market.

(c) Expansion and automation.

(d) Cost reduction.

(e) Better product range.

4. T - Threats

1. Competition from National and International **P.fnrket**
2. Government policies
3. Fluctuating exchange rates
4. Product obsolescence
5. Foreign policies.

Results of Planning

1. An agreed company n1ission statement.
2. A understanding of TQM to management team.
3. Clear:cut.allocation of re3ponsibility and authority to every member of organization.
4. *A* unison in the management action by both the teams and as a individual member.
5. Careful SWOT analysis of the systen1.
6. Setting up of clear mission, vision and objective of the company.

11

Quality Policy

The purpose of Strategic Quality Management includes establishing guidelines for the action t:J be taken in order to reach the quality goals. A major tool for establishing such guidelines is "Quality Policies". Policy means a guide to managerial action. The quality committee plays a major role in the formulation of quality policies.

The quality policies declare the intention to meet the needs of customers. The policy states "the company's products should provide customer satisfaction" or "company product shall equal or exceed competitive quality". The quality committee should make sure that providing quality policies correcting reflects the company's intention with respect to quality.

The policy will serve sensitivity to customer requirements and introduce the idea of a shared responsibility for providing first class product or service.

Some of the basic elements of quality policy are :

1. Customer focus.
2. Quality assurance.
3. Company work culture.
4. Continuous improvement.
5. Staff Empowerment.

Quality policy document of the quality policies of the companies are given below :

I. Quality is the responsibility of the whole workforce.
2. There should be a continuous improvement program for the quality.
3. Management must install a culture which empowers all staff to assume this responsibility.
4. A co-ordial work culture must be established based upon the belief that people are essentially responsible and must do a good job.
5. Responsibility for success and failure must be shared by all rather than individual.

The TQM initiative and implementation must be under the overall co-ordination ofa quality steering group or quality implementation team adopting the co-ordinating role.

QUALITY POLICY CASES

1. POLICY OF EDUCATIONAL INSTITUTION

Our Vision. To become an eminent Indian deemed Unive_rsity of Technology contributing significantly to the advancement of Global Society.

Ou?"Mission. To mould youth into world-class technocrats of tomorro-" who wou]d endeavour to increase the quality of life for human kind.

Our Quality Policy. We are committed to provide study oriented healthy environment and facilities for students to achieve academic excellence for employability as world-class technocrats.

Our Objectives

- > To serve as model for education in technology by innovative teaching methods that create a learning enviornment.
- > To keep industrial orientation in the curriculum to meet R & D challenges of 21st century.
- > To make students aware of environmental and energy conservation concerns of the planet.
- >- To maximize the students potential by expanding the awareness of educational and career opportunities.
- >- To cultivate among the students enterpreneurship.
- > To inculcate human values with ultimate objective of moldings the youth to work for the betterment of mankind.

2. POLICIES OF HERO HONDA

KEY POLICIES
AN ENVIRONMENTALLY AND SOCIALLY, AWARE COMPANY

At Hero Honda, our goal is not only to sell you a bike, but also to help you every step of the way in making your world a better place to live in. Besides its will to provide a high-quality service to all of its customers, Hero Honda takes a stand as a socially responsible enterprise respectful of its environment and respectful of the important issues.

Hero Honda has been strongly committed not only to environmental conse ation programmes but also expresses the increasingly inseparable balance between the economic concerns and the environmental and social issues faced by a business. A business must not grow at the expense of mankind and man's future but rather must serve mankind.

"We must do something for the community from whose land we **generate our wealth".**

A famous quote from Chairman Mr. Brijmohan Lall Munjal.

Environment Policy.

\Ve nt Horo Hondn nro **comrnittod to demonstrate excellence in our cnvironmcntnl pcrformnnco on a continual basis** ns an intrinsic element of our corpora tc philosophy.

To ochiovo this ,vo commit oursolvos to :

> Int grnte environmental attributes nnd cleaner production in all our bus1n ss. proceses and practices with specific consideration to subst1tut10n of hazardous chemicals, where viable and strengthen the greening of supply chain.

> Continue product innovations to improve environmental compatibility.

> C01nply with all applicable environmental legislation and also controlling our environmental discharges through the principles of "alara" (as low as reasonably achievable).

> Institutionalise resource conservation, in particular, in the areas of oil, water, electrical energy, paints·and chemicals.

> Enhance environmental awareness of our employees and dealers/vendors, while promoting their involvement in ensuring sound environmental management.

Quality Policy

Excellence in quality is the core value of Hero Honda's philosophy.

We are committed at all levels to achieve high quality in whatever we do, particularly in our products and services which will meet and exceed customer's growing aspirations through :

> Innovation in products, processes and services.

> Continuous improvement in our total quality management systems.

> Teamwork and responsibility.

Safety Policy

Hero Honda is committed to safety and health of its employees and other persons who may be affected by its operations. We believe that the safe work practices lead to better business performance, motivated workforce and higher productivity.

We shall create a safety culture in the organization by :

> Integrating safety and health matters in all our activities.

> Ensuring compliance with all applicable legislative requirements.

> Empowering employees to ensure safety in their respective work places.

> Promoting safety and health awareness amongst employees, s_uppliers and contractors.

> Continuous improvements in safety performance through precautions besides participation and training of employees.

Establi hi_ng pol_icy. Th top munngcmcnt hosto plnya very important role in establ shi g pohcy. Setting vision, strutogy, policy, direction, goals and 0 jectivc considering th ecuston1er requirement. The information forthis purpose can be g:1thered from warranty, claims, and customer complnint ecords. Customer survey, custmner focus group and benchmarking data.

Depl Y °;g poH y• 'l'he socond phase of policy management process is to]nnnch initial pohcy statements and receive commitment from *various* ctepartments thnt can make a contribution to the targeted improvements. The top management has to play as a 'policy champion' aud co-ordinate the company wide deployment of the corporate policy.

Jmplen1enting policy. This is a final stage of policy management process, where the new policies and methods are actually put into effect. The PDCA , PLAN DO CHECI{ACTJ cycle is very much goal oriented. Work of implementation can be assigned to self-managing tean1s. The whole planning proce3s should be continuously reviewed for progress.

Strategic Planning

Strategic planning enables leaders to manage change by focussing on an ideal vision of what the organization should and could be jn the coming five to ten years.

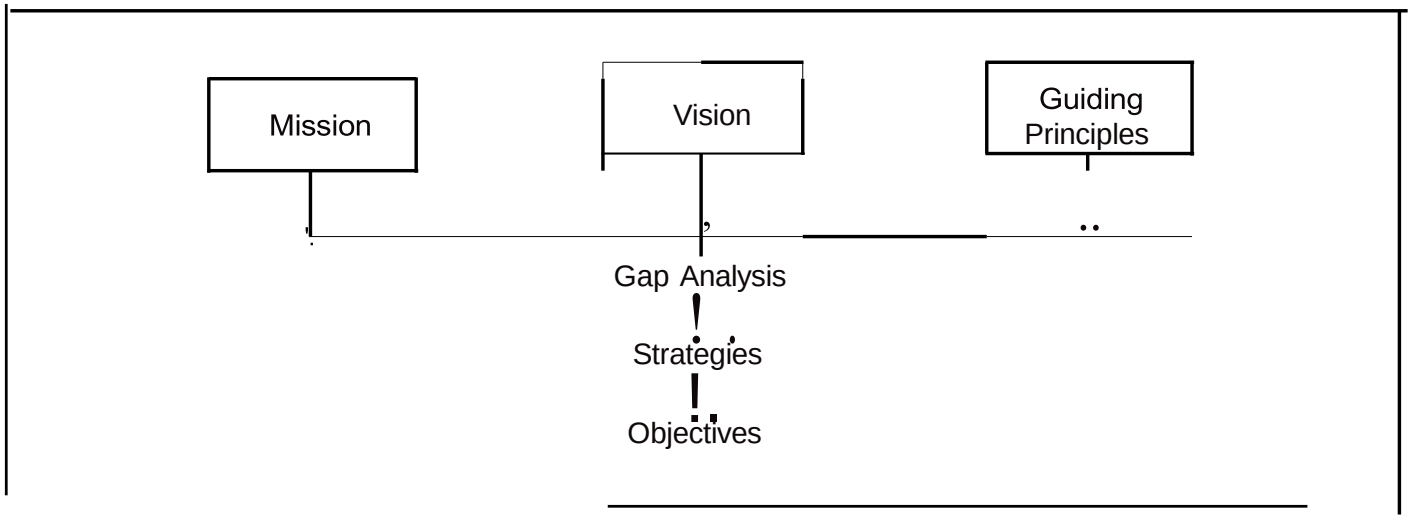
Strategy is a plan that integrates an organization's major goals, policies and action sequences into a cohesive whole.

Formal strategies contain three elements :

1. Goals to be achieved.
2. Policies that guide or lin1it action.
3. Action sequences or programs that accomplish goal.

Effective strategic revolve around the key concepts or thrust area such as customer satisfaction or customer focus.

Strategic Planning Process.



Mission. The mission of u firm defines its reasons for cxist<?nc e.

Mission includes :

A definition of products and services the organization provide.

Technology used to provide these products and services.

Types of markets.

,- Customer need or requirement.

)'- Distinctive Competencies.

Vision. Vision is a statement of the future. It articulates the basic characteristic that shape organizations strategy. It indicates where the organization is headed and what it intends to be.

Values. Values or guiding principles that guide the journey to the vision by defining attitudes and policies for all employees.

Goals. Goals or objectives that set the direction for the organization to take in Tealising its mission and closing the gap between where it is and where it wants to be.

Strategies. These are the vital actions towards the goal or objective.

Objectives. These are measurable actions that support the strategies.

Steps to Strategic Planning

The various steps to strategic planning are :

I. **Customer Need.** Find out the future needs of the customer. What are the requirements. How the organization meet and exceed expectations ?

2. Customer Positioning. Determine where your organization is in re]ation to customer. Do you want to retain, reduce or expand the customer network ?

3. Predict the Future. Demographics, economic forecasts, technical assessments needs to be carefully analyzed to predict the future conditions that affect your product.

4. Gap Analysis. Find out the gaps between the current state and future state of your organisation.

5. **Closing the Gap.** Develop the plan to close the gap by establishing goals and responsibilities.

6. Alignment. Align the plan with mission, vision and core values and concept of your organisation.

7. Implementation. Allocate the resources to collect data, designing changes and overcoming resistance to change. The planning group or committee should meet at least once a year to assess and take any corrective action needed.

HOSHIN KANRI

It is**a japnncsc term which means "Policy deployment". It** is a

method for deploying annual strategic plans do,vn through an organization. It is sub-divided into hvo major parts :

1. **Break throughs.**
2. **Business fundamentals.**

Break throughs. The chief executive and management team review the company's n1easurement indicator in order to identify the key issues affecting the business for a particular years. Input to this is sought from long-tern1 plan. The economic state of business, customer and employee satisfaction matters and a review of last years achievements.

Once review has been carried out, Consensus on the key business issue is shared within the team. The CEO and management team will agree the breakthrough objective for the company for the future period and the duties and responsibilities are assigned. From the objectives a maximum of five to six key strategies will be agreed and responsibilities are assigned. Each responsible employee of these strategies will view these as their objectives and will develop strategies and allocate duties further. Again these strategies will then become the next level objectives. This is called the process of cascading.

A critical part of any planning process is the review. "Did we achieve what we set out to do ? Hoshin uses a regular usually quarterly method of reviewing plans. Plans are reviewed bottom up. So when they reaches the top, the accountable manager should know whether the annual objective is achieved. With this in mind, it is very important that the correct measures are assigned to the strategies right from the start.

Once Hoshin plan is deployed to about the third tier of management, the plan changes from objectives and strategies to strategies and tactics. Strategies mean what you want to achieve, tactics say how and by when. It is important that employee responsible for tactics know the deadline and can manage the task .into his day to day work. Plan should be well deployed, launched, communicated and reviewed.

Business Fundamentals

Business fundamentals are split into four elements referred to as QCDE as explained below :

I. **Quality.** It includes customer satisfaction through product and process quality.

2. Costs. It includes all costs related item which a manager has to manage like manufacturing costs, productivity, selling cost, etc.

3. Deliverables. This is the output of the b siness department or process.

4. Education. It is the human resource measures that are important like training, employee development, appraisal and satisfaction.

These are the four business fundamentals that we hould monitor and chart them regularly. Business fundamentals are healt measures of busines$ managers should flug issues and subsequent process_ improvement activities. They are essential for the business success and will keep the econoni con1peti1i1ve. y

Types of Plan

As discussed earlier Planning is very essential for the success of any business enterprise. Better co-ordination, well-defined objective, improved performance standards are son1c of the benefits of planning.

There are hvo types of plan :

I. **Long Rnnge Plan**

2. Annual Plan

Long Range Plan. A long range plan includes ap analysis of the current situation (S\VOT analysis) and then define the broad objectives and strategies that must be pursued. Long range plans may be of varied time, duration generally 5 to 10 years. Long range plan includes company growth, products, market, custon1er and countries covered.

The long range plan covers the following areas :

1. Organization's mission and vision.
2. Customer focus and needs.
3. Analysis of competitive situation.
4. Product range, technological changes.
5. Financial analysis of revenues, cost of goods, expenses, overhead costs and profit
6. Chances of expansion.
7. Change in plant layout.
8. Product design and development.
9. Five year plan for organisation plans, objective for marketing, design, manufacturing, HRD, Quality etc.

IO. Development of partners in a global market.

The entire above mentioned areas_needs to be carefully analyzed every year because 1narkets and competitions changes and govt. policies around the globe varies.

Annual Plan. Apart from the long range plan every organization must have some annual plan. The success of long range plan depends largely an annual plan. If the ?rgan zat on is able to achieve Annual plan objective then the long range plan s. ObJective can be easily achieved.

Japanese introduced two concepts :

1. **Hoshin Kanri**
2. **Nichijo Kanri**

These concepts originated in 1960 nt llric.1gostono tyro company in Japw1. Jany companies in Japnn which hnvo introduced thoso conceptttt have won the prositigious Dcn1ing prize. Hoshin Knnri philosophy odginatos with nndcnt military traditions nnd efficiency. Mnny companies around the world have adopted these concepts.

Hoshin l{nnri. Hoshin n1oans objectives or directions, while Kanri moans control of n1nnageinent. **IJoshin Knori moans policy management or management of objective.**

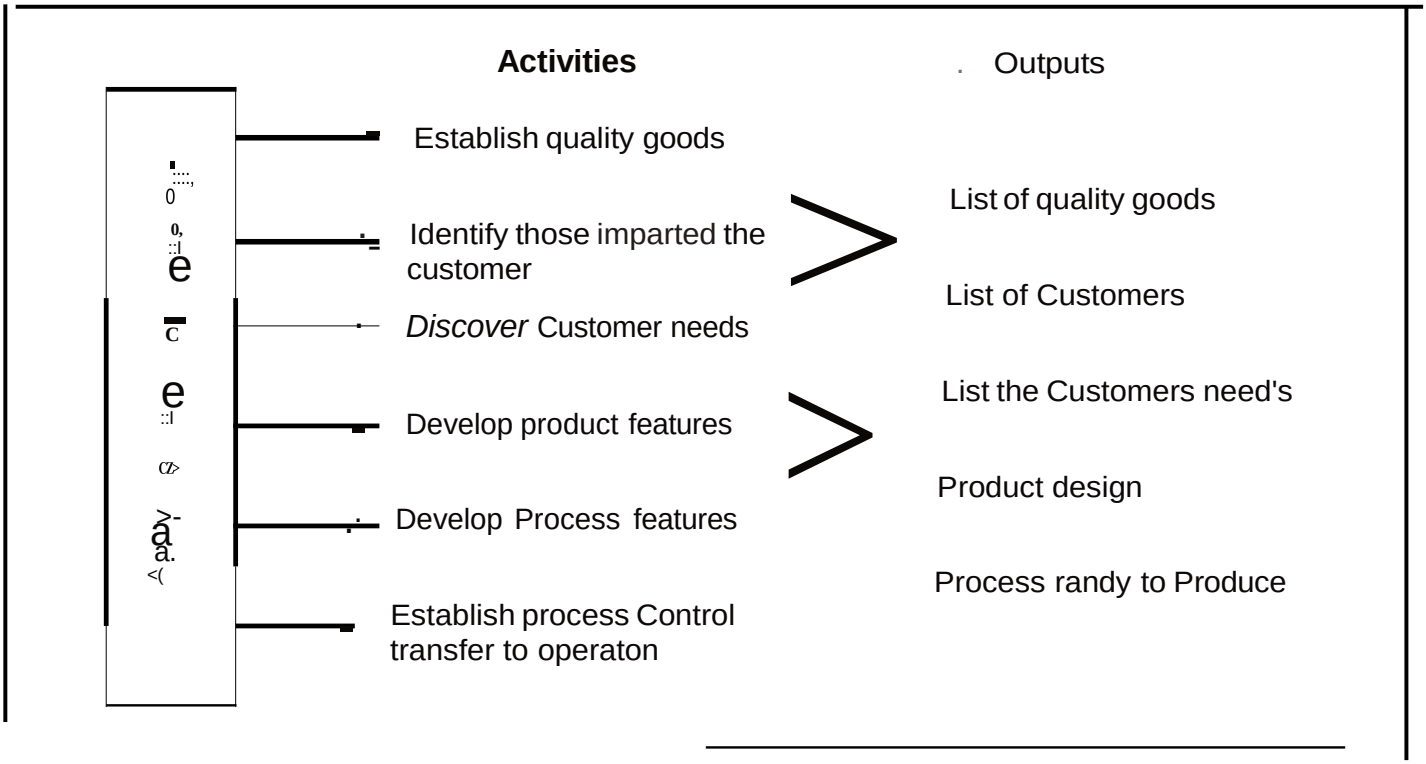
Nichijo Kanri. Nichijo moans dnily Nichijo Kanri means daily management. Daily management is essential for day to day of managing the processes.

QUALITY PLANNING

The various steps of quality planning rood map arc described below:

1. Establish quality goals.
2. Identify Customers.
3. Discover customer need.
4. Develop product features.
5. Develop process features.
6. Establish process control, transfer to operations.

The Ford Motor Company in 1980's began the initial planning for a new front wheel drive midsize car. The business environment included some ominous elements ; strong foreign c01npetition, decreasing market share, and increased fuel prices. Ford concluded that a new approach to designing the model was essential.



Historically new cars were designed using traditional organizational structure. The main activities were studied sequentially *e.g.* Planning studied custon1er desire and presented results to design, design performed its task and handed results to Engineering. Engineering department then created detailed design specification & handed it over to manufacturing. This sequential approach results in minin1um of con1munication between departments each department hands its output to the next department. This leads to lack of co-ordination and cmnmunication for the next internal customer department.

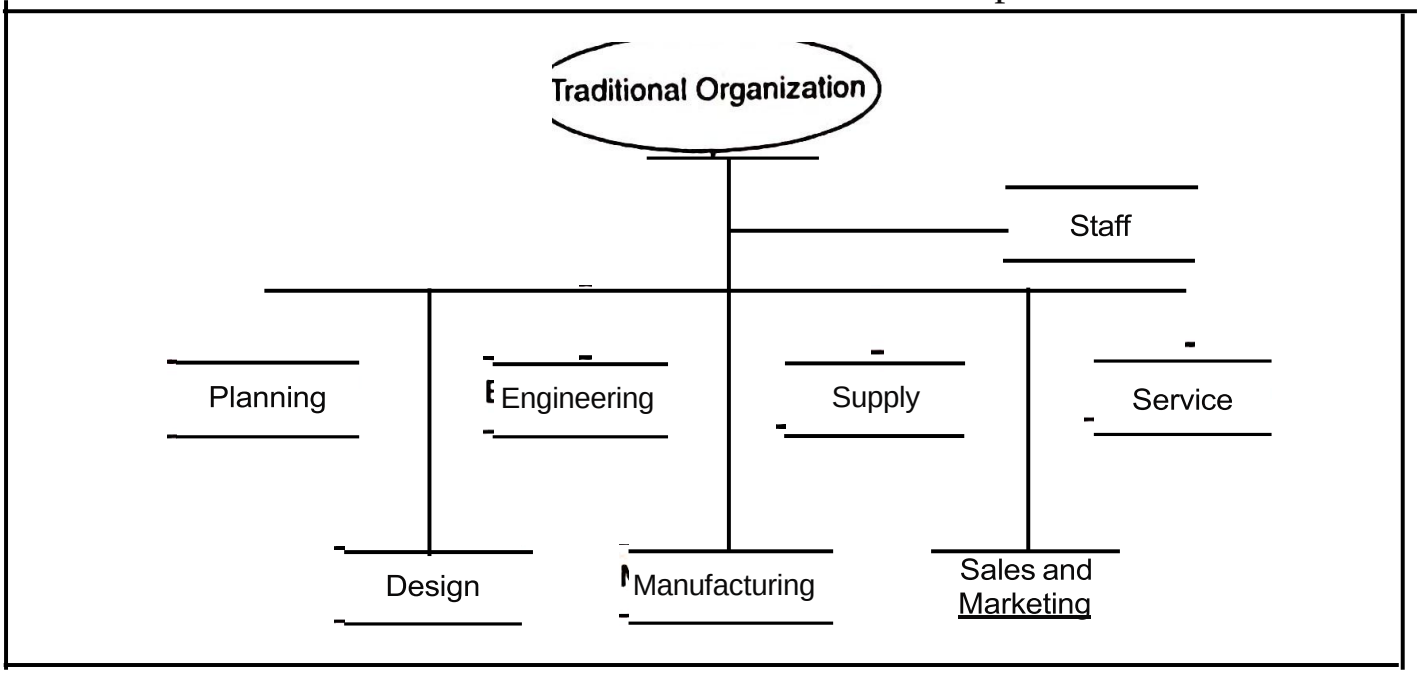
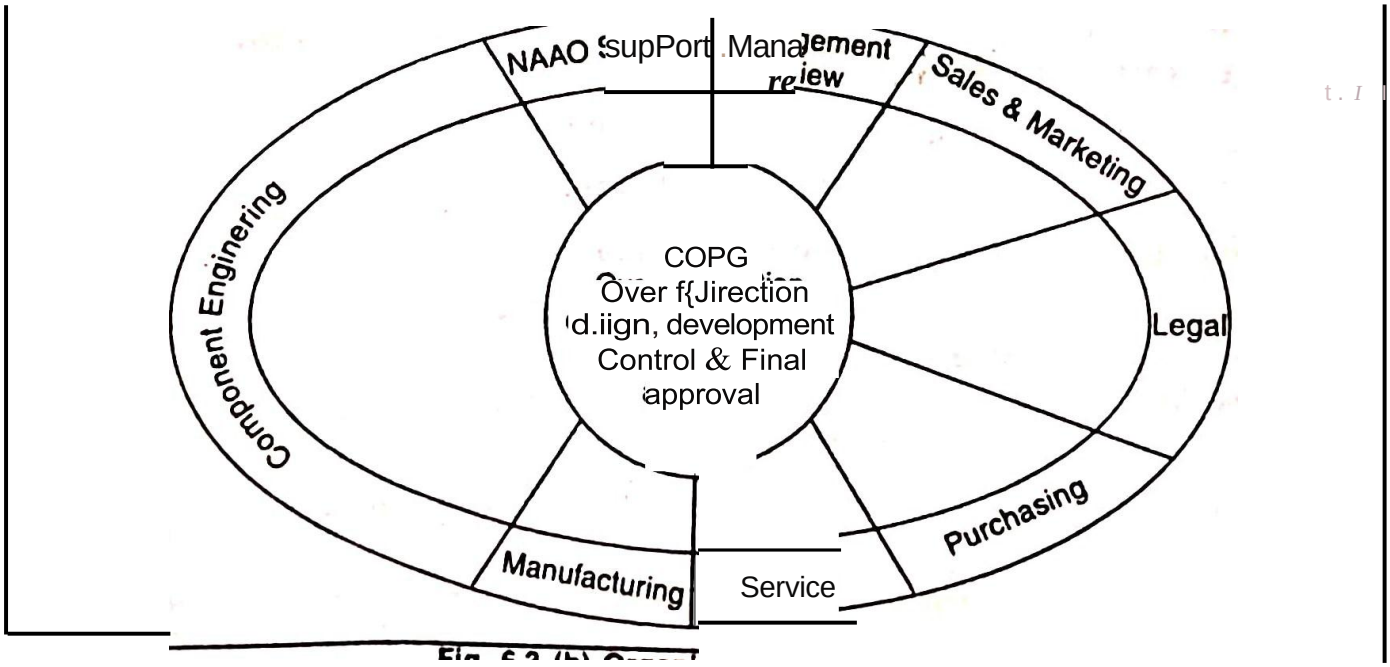


Fig. 6.3 (a) Tradltlonal Organization

But for the Ford's Taurus, activities were organized as a Team from the begining of project. Thus for example, Manufacturing worked simultaneously with Design and Engineering before the detailed specification were finalized.



Planning Dimensions. The various Planning dimensions are :

1. Repetitiveness
2. Time span
3. Scope
4. Level
5. Flexibility.

These are shown as

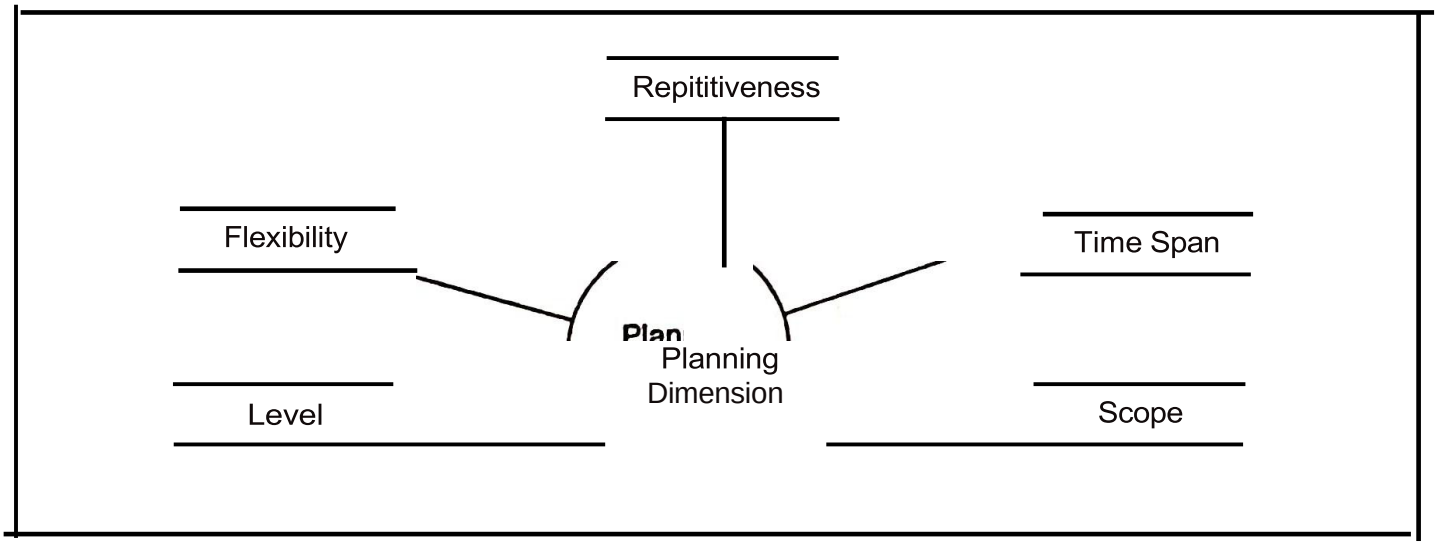


Fig. 6.4. Planning Dimension

I. **Repetitiveness.** It may be single use plan and standing plans. The single use plan set forth a course of action to fit a specific situation and may be obsolete when goal is reached.

Standing plans are designed to have continuous usefulness. They includE policies, methods, and standard operat ng procedures, designed to cover a variety of repetitiveness situations that organizations frequently face.

2. Time Span. Time span refers to the length of Planning. Based on time it is classified as :

(a) Strategic Planning (Long-Term Planning)

(b) Tactical Planning (Medium-Term Planning)

(c) Operational Planning (Short-Term Planning)

Strategic Planning is ge erally for a period of five years. It may relate to capacity expansion of a productive facility requiring a minimum time span to complete the design and construct new buildings, acquiring equipment installing and to make it operational.

Tactical Planning. It has a time span of 1 to 24 months. It is made Within the framework of long-term plans.

Operational Planning. It is related to current operations: It is prepared Usuallv for the time span of less than a month.

QUALITY FUNCTION DEPLOYMENT

Learning Objective

This chapter concentrate on the following points :

- > Quality function deployment : Concept
- > Application and Benefits of QFD
- > Steps in designing of QFD.
- > Quality Assurance - Concept
- > Quality Audit·
- > Quality Surveys
- Product Audit
- > Quality Assurance Method

Introduction

Quality function Deployment (QFD) is a powerful technique to know the customer requirements and accordingly design new products and services. In a highly competitive world, it is essential for the companies to continually know about the changing expectations of its cust mers. Quality function deployment (QFD) isa structural approach to define customer needs or requirements and translating them into specific plans to produce products or services to meet !heir needs. The "Voice of Customer" is the term to describe these stated and instated need of customers. QFD helps to understand the importance that customer attach to their various expectations. It isa challenging to understand• What the customers exactly want. In most cases, the number of customers may

Prof. Yo Ak o 0972), rcsently a professor at Ashi University, Tokyo hOS been creditedw.[1]th_,de:elop1ng this technique to the present form. Another e.xpcrt in the area of I• 1? is Fukuhara. He is associated with the Central Japan Qunlity Centrnl A ocintion. He n1ainly focusses on the house of quality, namely • the product definition aspect.

To conclude QFD is a powerful tool for use within a TQM progran1me. It is basically a planning tool, to ensure that the customer's needs are first understood in the customer's own terms. Their needs are deployed into design require1nents and subsequently through the manufacturing chain of critical part characteristics and key process requirements.

APPLICATIONS OF QFD

The various applications of QFD are as follows :

> New Product development in competitive scenario.
Setting design quality and planned quality.
> Analysing and accumulating information from market.
> Bench n1arking competitive products.
> Communicating the quality related information.
> Reducing development costs.
> Reducing design cha11ges.
> Expansion of company's market share.

8enefits of QFD

The benefits of QFD are numerous. There are_tangible and intangible l>enefits ofQFD. The various benefits of QFD are as follows :

> It improves custom er satisfaction.
> It considerably improves the quality of product•.
» It significantly red uces the start up and engineering cost. It is estimated that 30% of the cos reduces because of implementation of **QFD.**
> It eliminates late engineering changes.
It significantly reduces the development time u p to 50%.
More eflicient allocation of resources.
> Facilitates multi disciplinary team. work.
Strengthens good relationships bet\veen customer and the company.
Considerably increases the market shnre•.
> QFD through documentation elps in building product dev, lopment intelligence, prevents_ reoccumng ,of errors.
> QFD collects anftnalysis latest information on continuous basis and allows for quick changes in product development process.

Yoshizawa (1997) listed the following points os the sign i: ::- D 1n Industry.

QFD hns rcdefinod quality control in manufacturing by moving . npstrcmn to quality control for development and design. it

QFD hns provided a communication tool for designers. Enc-ine positioned midway botweem marketing and production, need to tae{s u adorship role in new product development. e

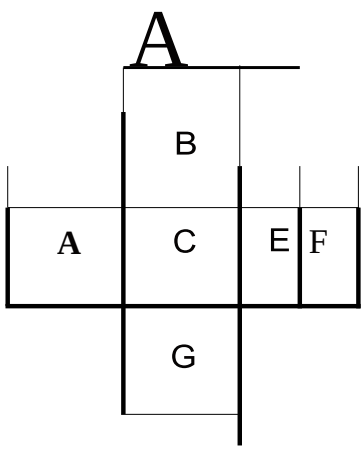
STEPS IN DESIGNING THE QFD HOUSE OF QUALITY

The various steps in designing the QFD house of quality is listed **and explained in detail below :**

Conduct marketing research to determine " Voice of Customer" (VOC)

Determine the various technical requirement with respect to various 'VOC'

Determine the relationship values between various 'VOC' and technical requirements



QFD House of Quality

Determine the corelation between the various Technical requirement

Survey the customers to determine the Important ratings of various voe

Determine the rati"J1s of the company an its main competitrors with respect to various technical requirement

Survey the Customer to determine the rating of Company and its main Competitor w.r.t various voe

Find out the Various feasible technical requirements and select those which are required most

1. e nduct M_nrko ing Rusoarch. *It* juvoJvcs Hurvcyiug th cuAtomcr to determine l_hevoice ot r.uHtomer thnt iR their requirementud need. The proper marketing re³:nrch ha t, bo coouucted. Tho morkeLing research can be c nduc d by usmg task force, personal /tolephonic interviews, mail quest10nna1res etc.

'fhc numb r of customers, ago group and demographic location hould be considered in survey for exnmplc whiJe Jaunchi.ng the 111otorcycle the custorncr has to be surveyed regarding the various factors :

1. Power
2. Mileage
3. Cost
4. Ease of Maintenance
5. Other motorcycles in that category.

The various 1nethods that can be adopted for the survey arc :

1. Personal Interviews
2. Telephonic survey
3. Mail Questionnaire
4. Group discussion from a group of customer for that particular product.

The Companies have to adopt th particular method as per their product requirement and need. The methods have their own advantages and limitations.

2. Determination of various technical requirement with respect to **voice of customer.** Each VOC has to be translated into one or more technical requirement, that is, the type of language the company uses to describe it products for design, processing and manufadure. This is very important step as the customer need is translated or analysed to determine the various technical requirements.

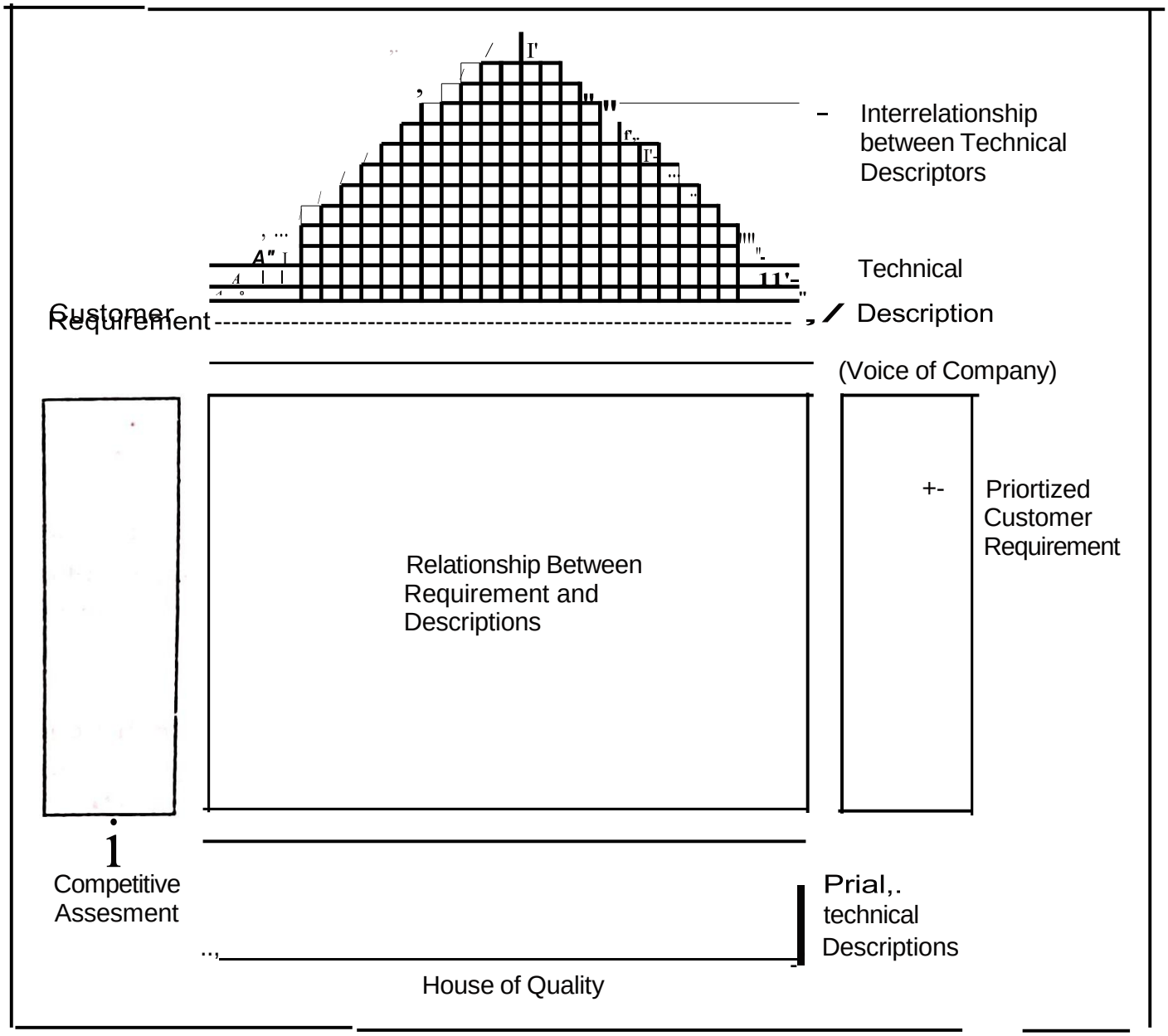
3. Determine the relationship values between various voe and technical requirements. It involves the deter1nination of the relationship values between various voices of customers and technical requirements. The relationships which are the need of the customers are met or taken into consideration for the product development.

4. Determine the correlation between the various technical requirements. The inten·elationships between various technical requirement are studied and analysed. Those technical requirements which have stronQ' co-relation are taken into consideration accordingly.

5. Survey the customer to determine the importance rating of various voe. In involves the sample group to rate the various voices on a scale of I, 3, 5, 7, and 9. \iVith the value 9 representing the highest importance. The arithmetic average of the importance rating for each voice is taken and accordingly the designer takea into consideration the importance of that particular voice.

- **Survey the customer to determine the rating of company** and **its nu1in compl'titor ,v.r t. various VOC.** ln this step involves survey.the custo111er to det.ennine the rating of compony and its main competitor. The group snn\ple of custmner are asked to rnt:c the coses and perforn1ance of the other w.r.t. vnrious voicos on a scale of 1, 2, 3, 4, & 5, 5 being the best performance. The arith1nctic average of performance for each voice is taken and due consideration is given to that particular point.

7. Detcrn1ine the ratings of the company and its main competitors ,vith rcsp ct to vnrio.u·s technica] require1nent. This step involves detennining the rating of the company and its competitors with respect to various technicul requiren1ent. This step is important fr01n company internal point of view. \Vhether the c01npany can meet the various technical requirement as desired by the custon1er or not.



8. l◂"lnd out the vn..louR fonBlblo tc•chnlcnl requirement nnd select thOS-l!,,hlch r<',1ulrc ruost. Tho finnl stop of Qunlity Function Deployment QFD 1 to unnlyscd t1_10 vnrious fonsiblo technical roquircment anti from the !ist of number of roqu1r mont , only those nro met which is the desire and ne Mi of 1nost of customer and fcnsiblo for tho compony.

Rcco1n111endntion of QFD. QFD is o extremely useful tool for facilitating, pJnnning, decision 1nnking with product development team. QFD requires discipline and dedicution to be successful.

Tho list of reco1nmendntion for QFD arc *:*

1. Seek approval from top management.
2. Use of Cross functional team.
3. l\.funager needs to ensure that all team members are aware of importance of QFD project.
4. QFD project must be clearly defined and understood by all the team members.
5. Obtain QFD training by learning from practical exercises.
6. Try to 1naintain focus by regular schedules of meetings.
7. Avoid technical arrogance that company personnel know more than the customers.

QUALITY ASSURANCE

All those planned or systematic actions necessary to provide adequate confidence that a product or service will satisfy given requirements for quality.

Quality assurance engineering deals with the assuring of the desired quality, reliability, service- and other aspects in the manufactured product, through scientific techniques.

There are three stages in consideration of total quality of product related to quality assurance.

I. **Design Stage.** To ensure that the quality of. design is according to the needs of customers.

. **2. Manufacturing Stage.** To check whether the quality of products manufactured conforms to design and specifications. .

3. Field Observation. To analyse the performance in actual field, in view for the product development.

To sum total quality of Assurance = Quality of Design + Quality of rnanufacturing conforming to design + Quality of Performance.

Concept of Quality Assurance. Quality assurance is the term most often Used to describe 8 format system within a con1pany for managing quality control activities. A quality assurance system formally defines and control all company activities that affect customer satisfaction ith thequalit); of goods or services.

QUALITY AUDIT-The Concept:

Qunlity nudit is un ind d t pen en rov1ow conducted to compare Rome nspect of qunht)pct lot innnco with u stnndanJ for thnt performance. The independent menns th nt th eperson (or reviewer, auditor) is neither the person responsible for he pcrfonnnnco nder 1:oview nor the immedi,ic supervisor of thnt person. An tnrlcpondont nud1t provides nn unbinsod picture of perfornu1nce.

. **-SO 8402-198 d finitions spells out some additional aspect:** Quality nud1t ts u systcnintic, independent examination and evaluation to determine whether qunlity nctivities and results comply with planned arrangements and whether these nrrnngen1ents are implemented effectively and are suitable to achieve objectives.

Quality audits are used by companies to evaluate their own quality performance and the performance of their suppliers, lincenses, agents and others by regulatory agencies to evaluate the performance of organizations, which they are assigned to regulate.

The specific purpose of quality audits is to provide independent assurance that :

1. Products are fit for use and safe for user.
2. Products conforms to specifications.
3. Plans for attaining quality are such that if followed, the intended quality will in fact be attained.
4. Standards are regulations defined by government agencies, industry associations, professional societies are being followed.
5. Procedures are adequate and being followed.
6. Data system provides accurate and adequate inf9rmations on quality to all concerned.
7. Deficiencies if any are identified and corrective actions are taken.
8. Opportunities for in1provement are identified and necessary actions are taken.

Types of Audit

The various types of audits generally carried out are :

1. **Adequacy Audit.** It is also called as management audit. It determines th e ex t• t en to which the documented system, represented in quality manual and the associated procedures, wor k 1nstruc t. ions an d ti orms, a d equately meets •'-'.... - .... ••: ,..mnnt. nf the standard.

2. Con1pliance Audit. It is carried out to establish the extentt which the docun1ented system 1s in1plemented and observed b; workforce.

3. External Audit. External audit is carried out to by one organizatio or another with which they have entered into contract to purchase goods 0 provide services or intended to do so.

4. Extrinsic Audit. This is an external audit carried out by an independent third party that n1ay be accredited, using a national or internaitonal standard such as ISO : 9000 series to provide assurance on the effectiveness of quality system.

5. Internal Audit. It is audit carried out by company on its own quality systen1. Its purpose is to give assurance to management that its quality systems are effectively achieving the planned quality objectives.

The ,vork of auditing can be divided as follows :

I. **Audit Initiation.**

2. **Audit Preparation.**

3. **Audit Execution.**

4. **Audit Report.**

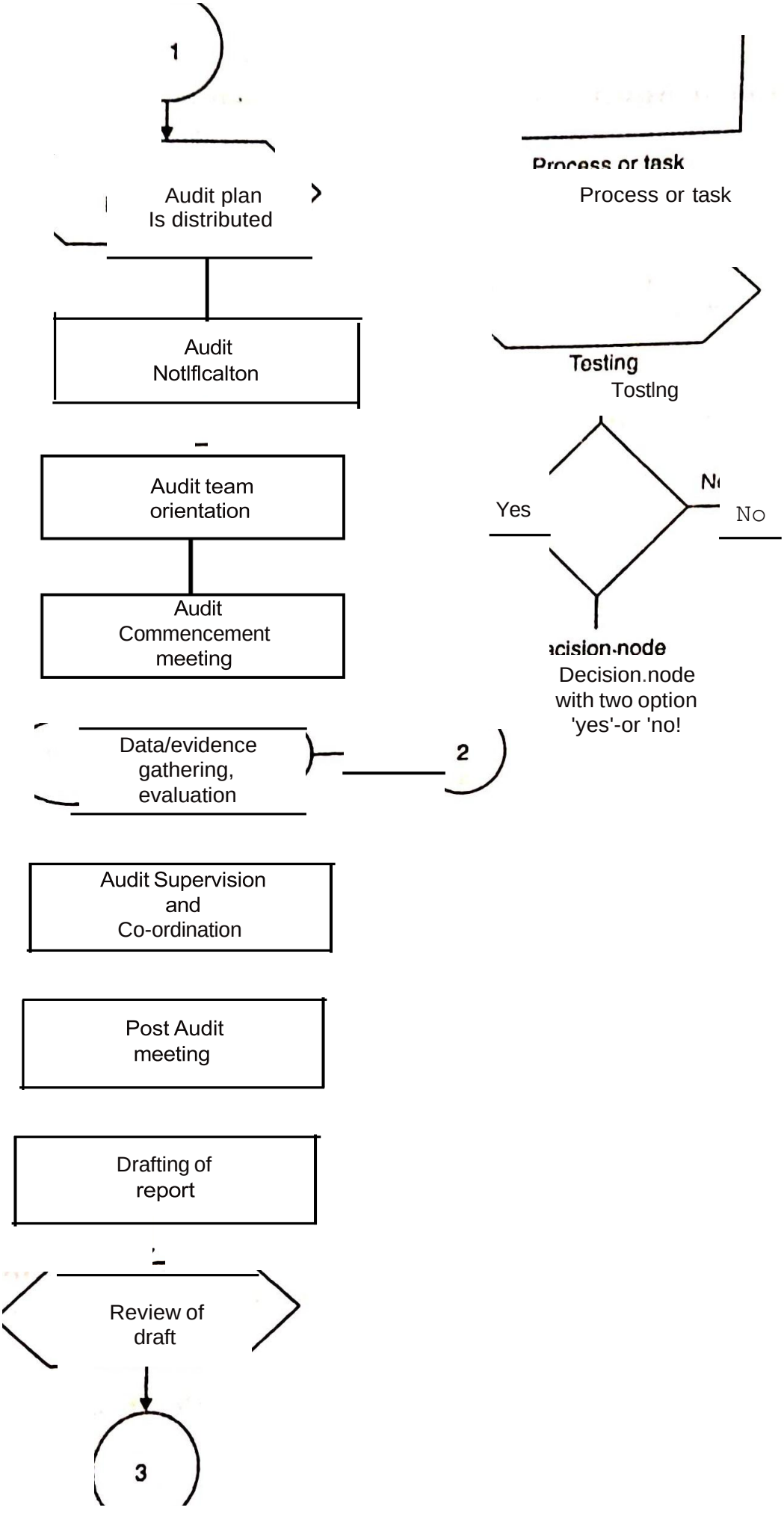
Audit Initiation. An experienced, alert auditor is often able to discover opportunities for in1provement as by product of his or her search for discrepancies. These opportunities may even be known to the operations personnel. However, these personnel n1ay be unable to act due to lack of control, inability to communicate through the hierarchy levels.

Audit Preparation. After the initiation process, the audit notification is done and audit team is oriented. Then gathering of data and evidence is carried out to prepare for the audit.

Audit Execution. After audit preparation and gathering of data and execution is done. Audit supervision and co-ordination is maintained. Post Audit meeting were scheduled.

Audit Report. Drafting of the report is carried out after reviewing of the drnft and finally the audit report is finalized and distributed to all

The flow chnrt of qunlity audit is described below in dct-ui)



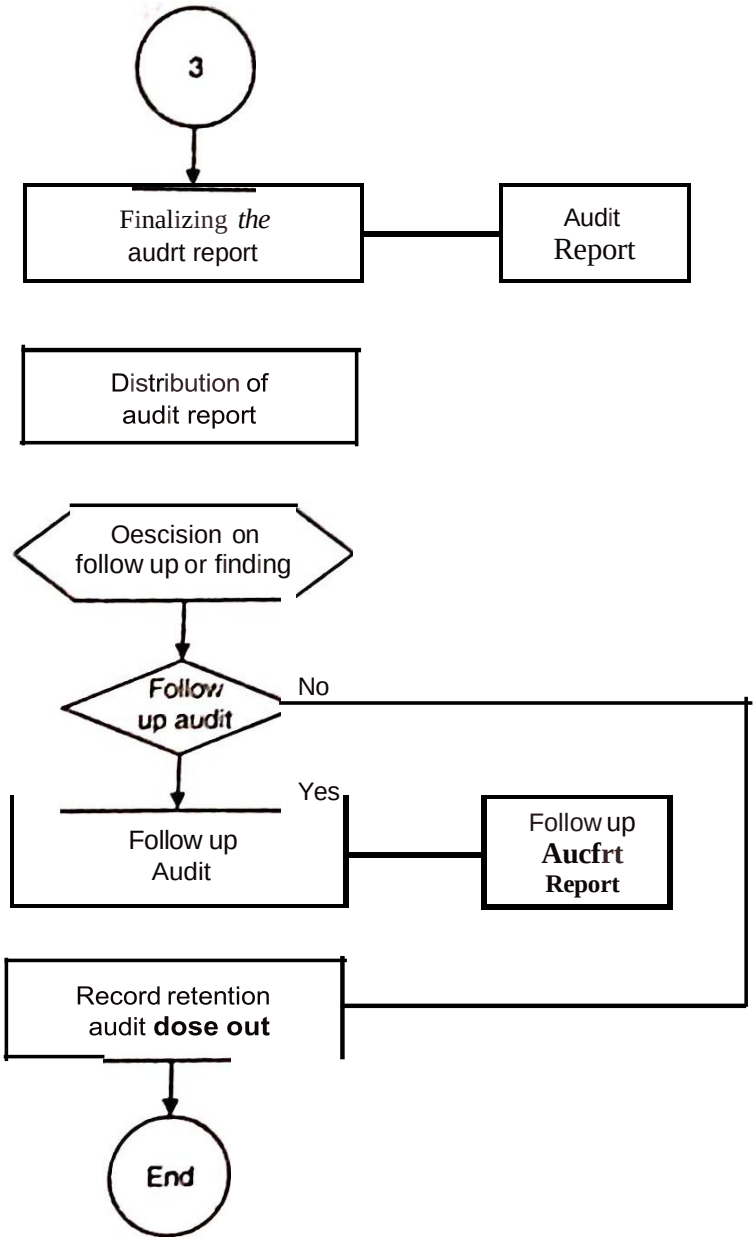


Fig. 7.3. Quality Audit Flow Chart.

Quality Surveys. As described earlier, audits provide answers to some vital que tions and must be regarded as an essential element of quality assurance.

These audits are not sufficient to provide full assurance to upper management that all is well with respect to quality since they commonly **arc not concerned with following matters** :

- ,,.. Relative standing in marketplace with regard to quality.
- Opportunties for reducing costs of poor quality.
- Employee perceptions on quality.
- Challenges to top management itself with respect to policies, goals. premises, etc.
- > Challenge to product development, Design Engineering.

Pro,·iding such 1nisRing clomonts of quuJity nssurnnce requires a brouder viow thun tho structured audit. '!'his broader view is called quality survey, or quality nssessment. or company wido uudit.

In other words audit discovers discrepancies and alarm sifrnal, the survey goes further nnd nlso discovers opportunities and unexpected threats.

Surveys can be acco1nplishcd in several ways :

1. Assessing the quality systom using published criteria which emphasizes defined elements of quality system. An example of such criteria is the ISO 9000 : Specification.

   ISO 9001 : Design and development. p1·oduction, Installation and Service

   ISO 9002 : Production and In£:tallntioa

   ISO 9003 : Final Inspection and Testing
2. Assessing the quality systen1 using published criteria which emphasizes quality, results *e.g.* Malcolm Baldrige National Quality Award, Deming Quality Prize.
3. Assessing the quality system using criteria developed within a company for use in evaluating its own operations.
4. Using an overall framework which includes an assessment of both quality results and quality systems.
5. Assessing the quality system using criteria developed within a company for use in evaluating its suppliers.

Product Audit'

Product Audit is an independent evaluation of product quality to determine its fitness for use and conformance to specification.

The purpose of product auditing includes:.

1. To check the quality level as delievered to customer.
2. Evaluating the effectivene s of inspection decisions in determining conformance to specifications.
3. Providing information which will be vital in improving the outgoing product quality level.
4. Provide additional assurance beyond routine inspection activities.

The various stages of Product Auditing are :

1. After Acceptance by Inspector.
2. After Packing but before shipment to field.
3. Upon Receipt by dealers.
4. Upon Receipt by users.
5. Performance in Service.

Audit plans must spell out or give guidance on, the selection of detailed Product dimensions or properities that are to be checked.

PROBLEM SOLVING AND QUALITY CONTROL (QC) TOOLS

Learning Objective

This section throw light on the given topics :

> Meaning of Problem.

> Step of Problem Solving Process.

> Seven Basic Quality Control (QC) Tools.

Problem Solving Process .

A Systematic problem solvingapproach focuses employees attention on three activities.

1. Enabling individual and work group to conduct careful analysis based on numerical and other data to explore potential solutions.
2. Planning for the implementation of optimal solution.
3. Monitoring the result of their corrective actions.

The various steps which are followed for problem solving process are :

I. **Identifying and Selecting the Problem.** Identifying and selecting a problem is the first step in problem solving. This step explores, clarifies and describes the problem for developing a clear understanding of it.

2. Analysing the Problem. This step involves stating of what is wrong.

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Special causcB on lh<: other hand ore specific to a particular c. p! _,, mnchine, or work practice.

Special ca1;.Rcs arc detected hy 11tuti11ticaJ ignal11and are u DiJlly identifl 1:tnd corrected hy in<livicJuaJti.

:1. Generating PotcnUuJ **Solution8.** In thi step, *many* aJt.c r; wuys to solve th«::pr<JbJcm aR pos1tiblc may be worked out. The be.t ,ofu i is sc1ectc:d from the numh£:r of altE>rnf.ltJVCS.

4. ScJccting nnd PlannlnJt the Solution. Th fourth *.rtc-p* evalua tht ulternativc solutions and sclcctHthe: best wlutJOn out of mony solution.a. T am conaenHu iR gcncrulJy taken *into* con1tidcrotion whil • selecting the 80luti After ReJccting the ,mJution, the palnnmy. is don for implementing the aelecti solution.

5. **Implementing the Recommended Solution.** *In* **thjs step** th t.eao iR formulated ond assigned r<'sponsibilitiea and dutiea *far* impl ·menhng tht recommended solution to make implementation mooth r ond) timt consuming.

O. Evolunting nnd Selecting the Solution. The team mu•t evalu *and* know how successful tho solution arc bccau.se they ore r pon ible *(OT* aolvint tho problem. The tca(Tlshould use 8Wti tico) tool *for* proble:m solving for t continuous improvement.

Seven Baste QC Tools

According to Deming, the Stntistical Quality Control{SQC, help! in findjnp problems, stating them in meaningful **terms** and solving them The SQC provid *a* plan or roadmap that Jca ton better competitive position. Atte-mpu to impra-te individual perfonnonce are useless whE:n th problem lies in the ,;y tern. Bttt the us<' of statistical tools by alJ employees provid a common method of identifying and unde111t.anding critical problems and **managing** their solutions by the focts.

The seven most commonly w;ed statistical tools for quality control6 arc :

1. Check sheet.
2. Histogram.
3. Pareto Cham.

4. CnuRo and Elli cl diotrrnm.
5 Scottct' diogrum.
6. Strntifi<·ution.
7. ontrol Churt1-1.

Check sheet

Ch ck she t providoH o Mimplc organized way to coJJcct data OR per frequency. 'h • k lwct *iR* importunl wh n thcr ore frequent f,ii]uro at work. 'fhc team *m* •mhcr. collect dntu bnHcd on eompl obHcrvution in ordor to identify patterns. Che .k Ii eta nre used for occountnbility purpo,;c. It is one of the most important tool t ollPct duto.

Th,! muln uHe of check sheet arc *:*

l. It provides clear picture about how often and what type of problem occurs.
2. It distinguish between foct nnd opinion.

Che;ck shc t iR quite important tool in controlling rejection. These can be U8ed in form port-tracking sheets or line-associate (LA).

Tracking 8heet to trace the parts that are causing more problem :

Part tracking sheets

Table 8.1. Part Tracking Sheets

S. No.	Part Name and Part Number	Make (Local or shipped)	May			
			1	2	3	4
1.	Weather Strip K-731546	Local	2	1	*x*	2
2.	Roof Pad vf-732067	Shipped Part	1	*x*	*x*	3
a	Copier Motor K-72:3416	Locnl	2	2	I	2

With Port-Tracking sheet tho mmn ports rejected are most frequontly Htudicd.

LA (Line Associate) Tracking Sheet

Aimilnrly LA-Tracking sheet can be designed to check LA'H (Lino Associates)

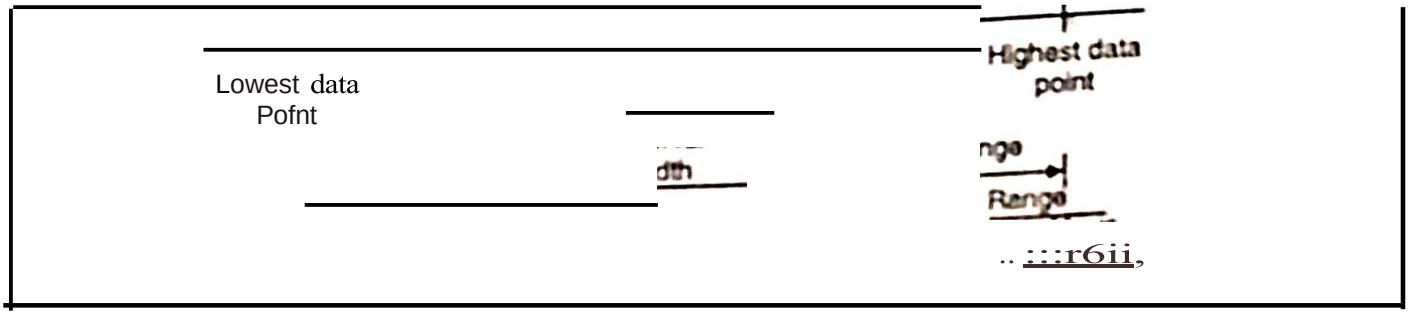
th,,t ""– L---'-1- ..... nn..t.a mnat fr nnont;Jv.

. construction Procedure

I. Gathering and tabulating data.

2. Determine the range of the data by substracting smallest data fron1 largest one.

3. Determine the number of intervals in the histogram oft.en betw n 6 and 12) and divide the range by number of intervals to detennin th width of each interval.



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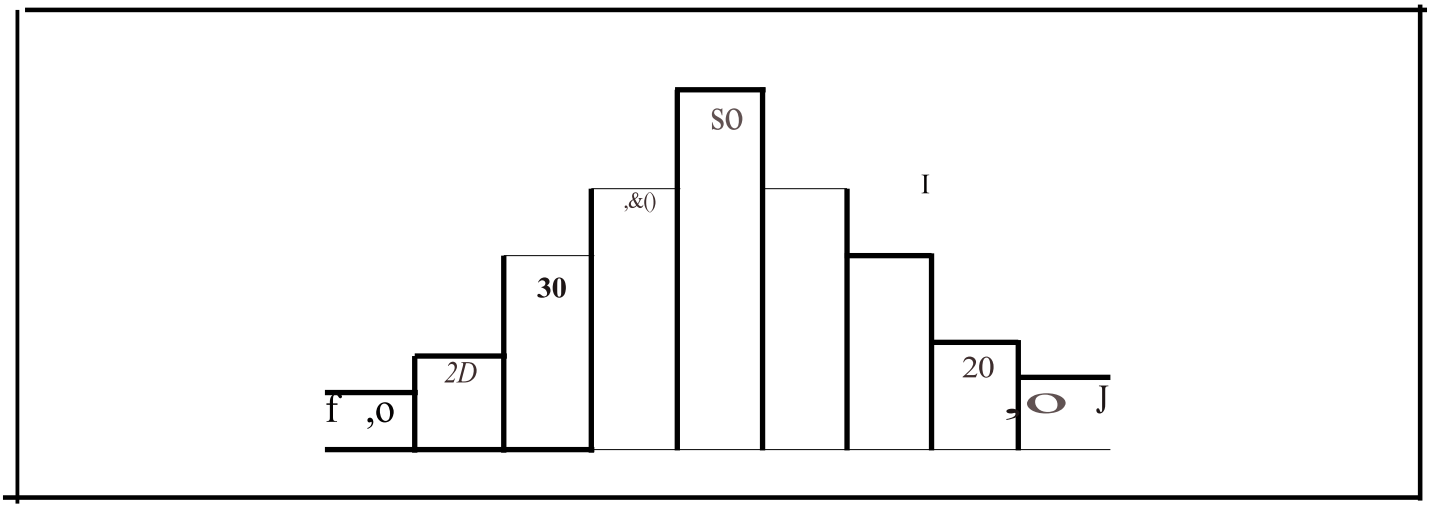
Shapes of Histogram

(i) Bell Shaped Distribution



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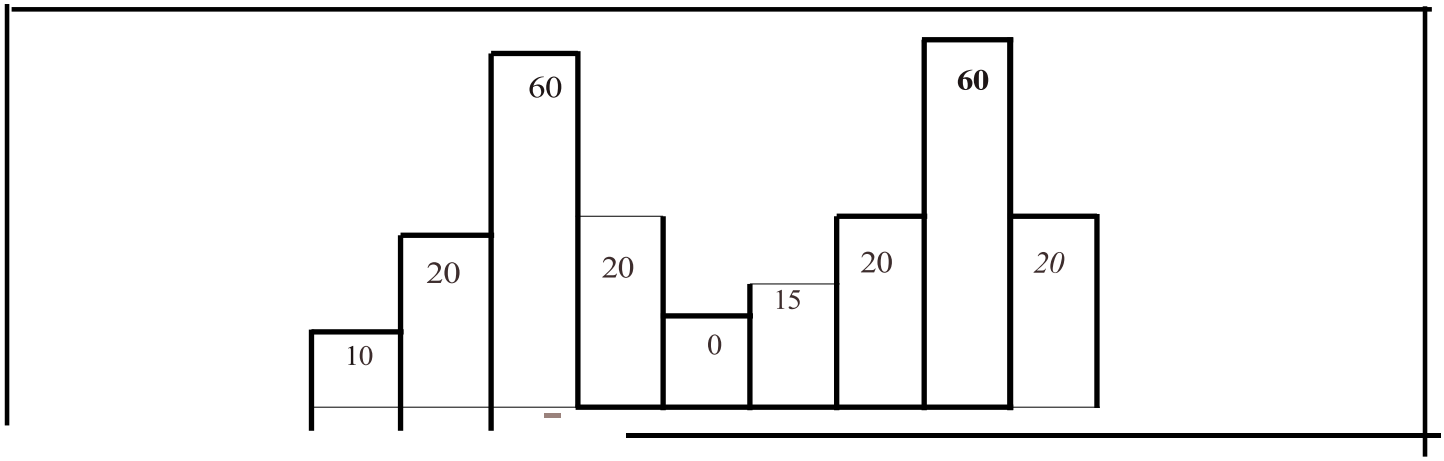
(ii) Double Peak Dfstributfon



Following nro the guidelines for choosing the number of categr,ries

Table 8.3

Number of data points in the sample	Numbers of categories
Less than 50	5-7
50-100	6-10
100-250	7-12
over 250	10-20

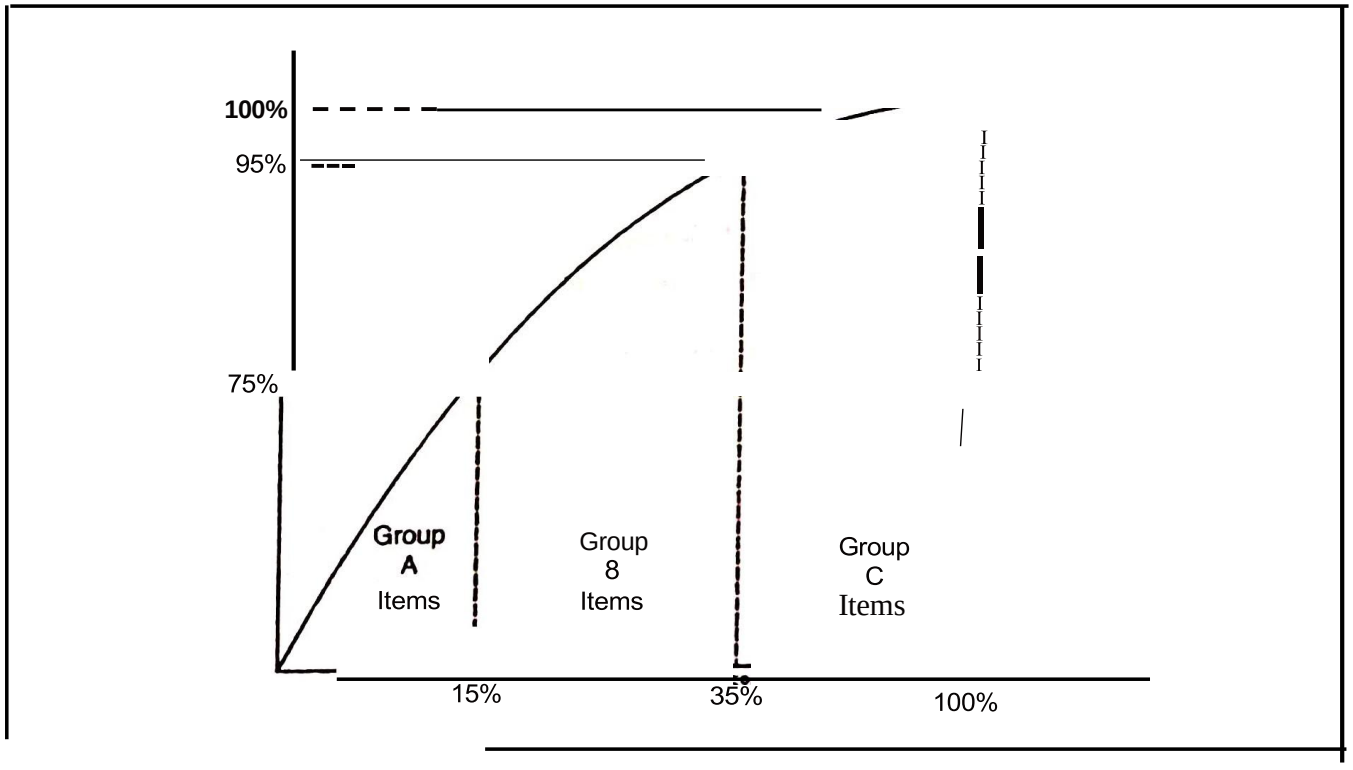
S. Pareto charts (Pareto diagrams)

Pareto principle was invented by Italian Economist Alfred Pareto (1848-1923). He studied the distribution of wealth in different countries. He concluded that fairly consistent minority about 20 percent of people controJied the large majority, about 80 percent of society's wealth. This is called the 80-20 rule and is called Pareto principle.

A pareto diagram is a bar chart that illustrates the frequency of reoccurence or the cost of a set of items. The items are shown in the descending order of importance from left to right.

Fig. below shows the distribution of percentage of money invested in **various inventory groups and percentage of inventory items.**

1. A small percentage of items (10 to 15% of items) held in stock represent the greater part (say 70 to 75% of total money) invested in inventories.



At th end of horizontal 1ino, n problems is listed. Each branch pointing into the n1mn stem represents n possible cause. Branches pointing to the causes ore contributors to those causes. The diagram identifies the most likely cause of a problem so that further data collection and analysis can be carried out.

Construction of Cause and Effect Diugram. Cause and Effect diagrams are constructed in n brainstorming type of atmosphere. Every employee of the organiz.1tjon g t involved and feel they are important part of problem solving process. It is a group technique ·and the cause and effect method requires significant interaction between group members.

Steps for Constructing Cause and Effect Diagram

1. Decide on quality characteristics (Effect).
2. Draw the back bone from left to right, terminating at the head and write the quality characteristics (effect).
3. Draw the big bone and write the primary cause.
4. Draw the medium sized bone and write the secondary cause (sub-cause).
5. Draw the small bone and write the tertiary cause (cause which is secondary to the sub-cause).
6. Ensure that all causes (factors) which influence tha effect (quality characteristics) are displayed in the diagram.

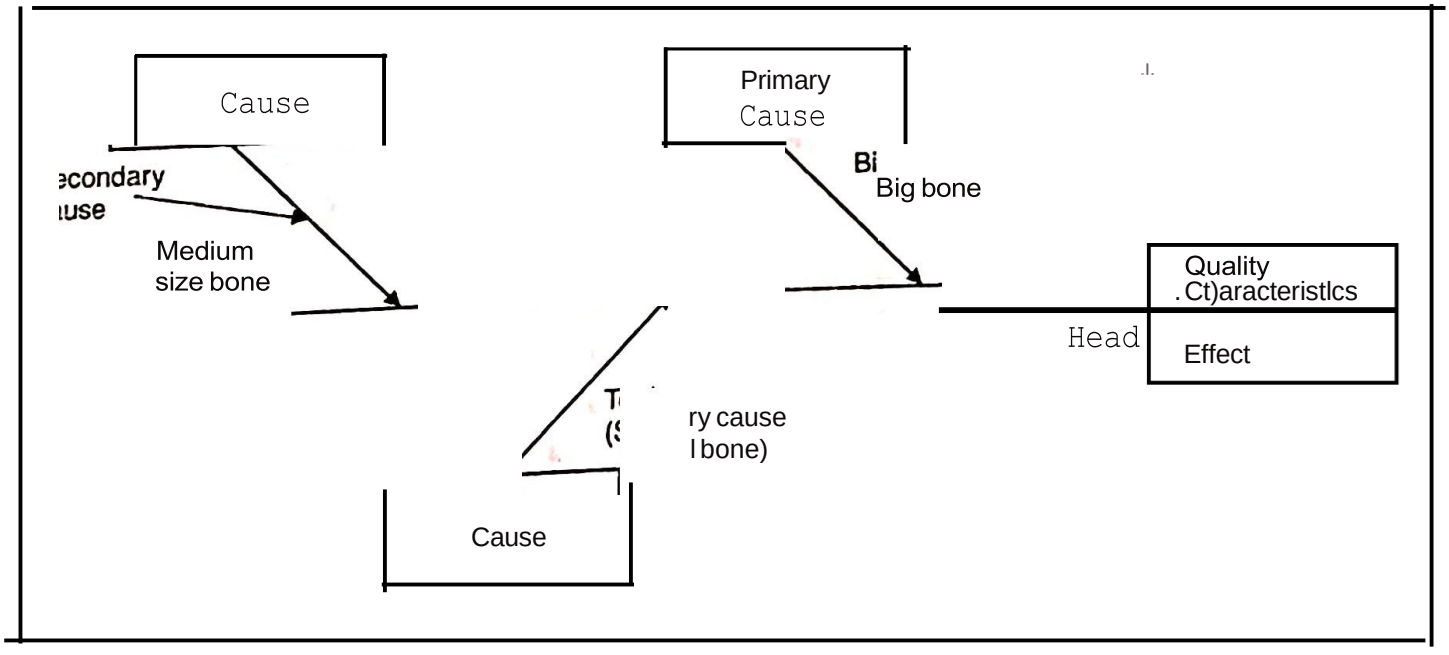


Fig. 8.10. Construction of Cause and Effect Diagram

Und r each of the major causes, the sub-causes are listed. This could be done exhaustively by brainstorming am?ngst the members of Q.C. Circles. Then each cause is analyzed thorug},lly to find the most influential cause resulting in poor quality of products Th most in uential ca s;.chosen amongst other causes is questioned thr.ough using five 'W s and one H *i.e.* what, where, when,

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t. Th pot. ntiul ·uuA fi of o prob!'m h •umc rcudiJy appare;r t ly on tru ·tint{ ci uo • nnd ff t diacrrorn. J1:ach ,ff,ct iB'!ViJ1ullU:: r1nf.: ly on in ord r to find ti tru cuu1:1of th probl •m.

2. A task group i constituted for the cause and effect dia11ram. 'Inu people work in group for a common objective.

3. Cnuse and effect diagro-ms reduces defects and thus improves quality.

4. It is constructed by the use of brain storming that enables to develop a wide variety of possible causes for a problem.

5. A clear picture of the process is seen visually. It cducateB people to in1prove their skills and helps in understanding the process better.

5. SCATTER DIAGRAM

Scatter diagram or scatter plots are used to determine whether relationship really exists between two process characteristics and the direction of the relationship.

A scatter diagram graphically illustrates the relationship between variables, typically based on quantita'tive data. They reveal bi-variate relationships, that is relaitionships between pair of variables, such as number of defects per batch against changes in th speed of production line or productipn time per unit against hours of training.

Scatter diagram can be prepared using the following sequence of steps :

1. Collect at least 30 sets of paired samples of related data (50 to 100 sets are more appropriate) and construct a data sheet.

2. Find the lowest and the highest values for X-axis and Y-axis.

3. Draw the horizontal and vertical axi and plot the readings. If the relationship between two data is of cause and effect, the causes values are usually marked as X and the effect value on the 'Y' axis. 'X' val uc is an independent variable and the 'Y' a dependent value (variable).

4. Plot the data on the chart. There could be positive correlation, negative correlation or no correlation between variables.

Stratificntion of clutu *iR* nothing but uogr . . t· th d t cglhJOn or rcpor 1ng e a a ,no[Cll)·nc-w1sc, Of>Orotor-wrno, ₀u)11·1·t-w1'sc ot c. f'or *1* 'd ont 1 y 1 n g 1 t 1e in fl uen cing *factors.* Tako upn .'xnmp]e 0.f brcokdown of mnchincs in*a* plant in oneyear. Theplnr t hn ,J1 Obi onkdown in *11* Yl'ar. If thiRinformation is proper]y segregated or stralrfi <l, itwould cnnblc the mnnogcment to plan action for systematic plant maintenance.

50 brcnkdown in Muchine I

20 breakdown 1n Machine II

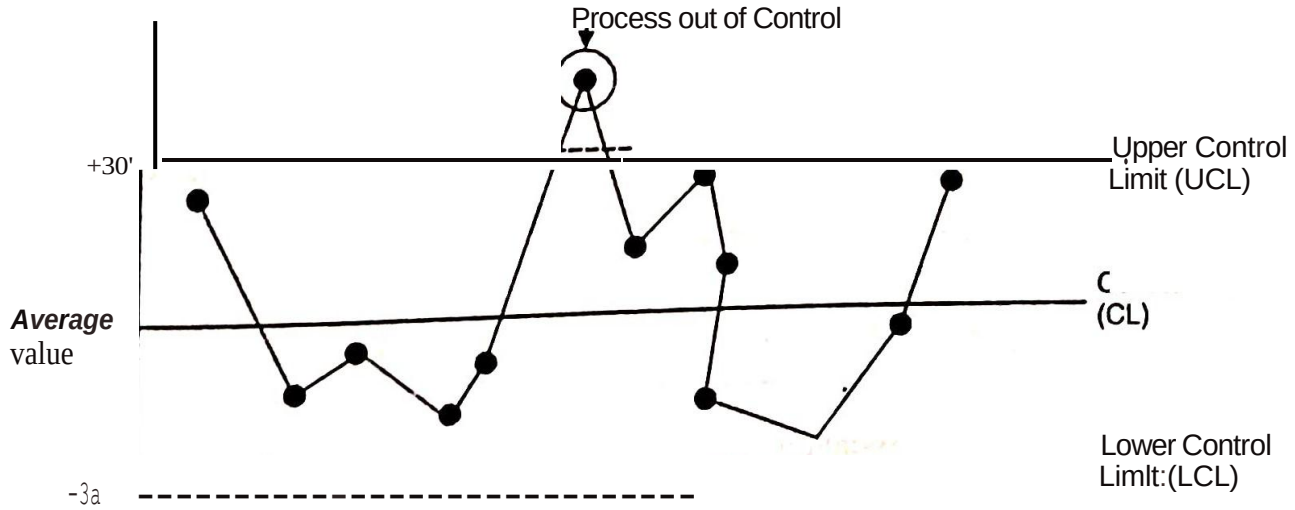
25 breakdown in Mochinc III

J!5 breakdown in Machine IV

From the nbovo stratificntion, it is clear that machine I needs immediate attention hccnuse of frequent breakdowns. This prob]em solving starts from trnta I on<l n1ovc to other machines.

7. Control Charts. Control charts were originally developed by Walter Shewhnrt (1920) but were perfected and used by Edwards Deming in 1950. Deming concluded from his research on control charts that 85 percent of improvement opportunities come frorn changes *in* the system which are management's responsibility while only 15 percent are within an individual employee's control.

A control chart can be used to discover how much variability in a process is due to random variations and how much is due to unique events, in order to determine if a process is under statistical control.



CONTROL CHART

BENCHMARKING

Learning Objective

Aft r reading this chapter, the students will be able to answer the following queries :

- > Concept, Definition of Benchmarking.
- > Types of Benchmarking.
- > Benchmarking Process.

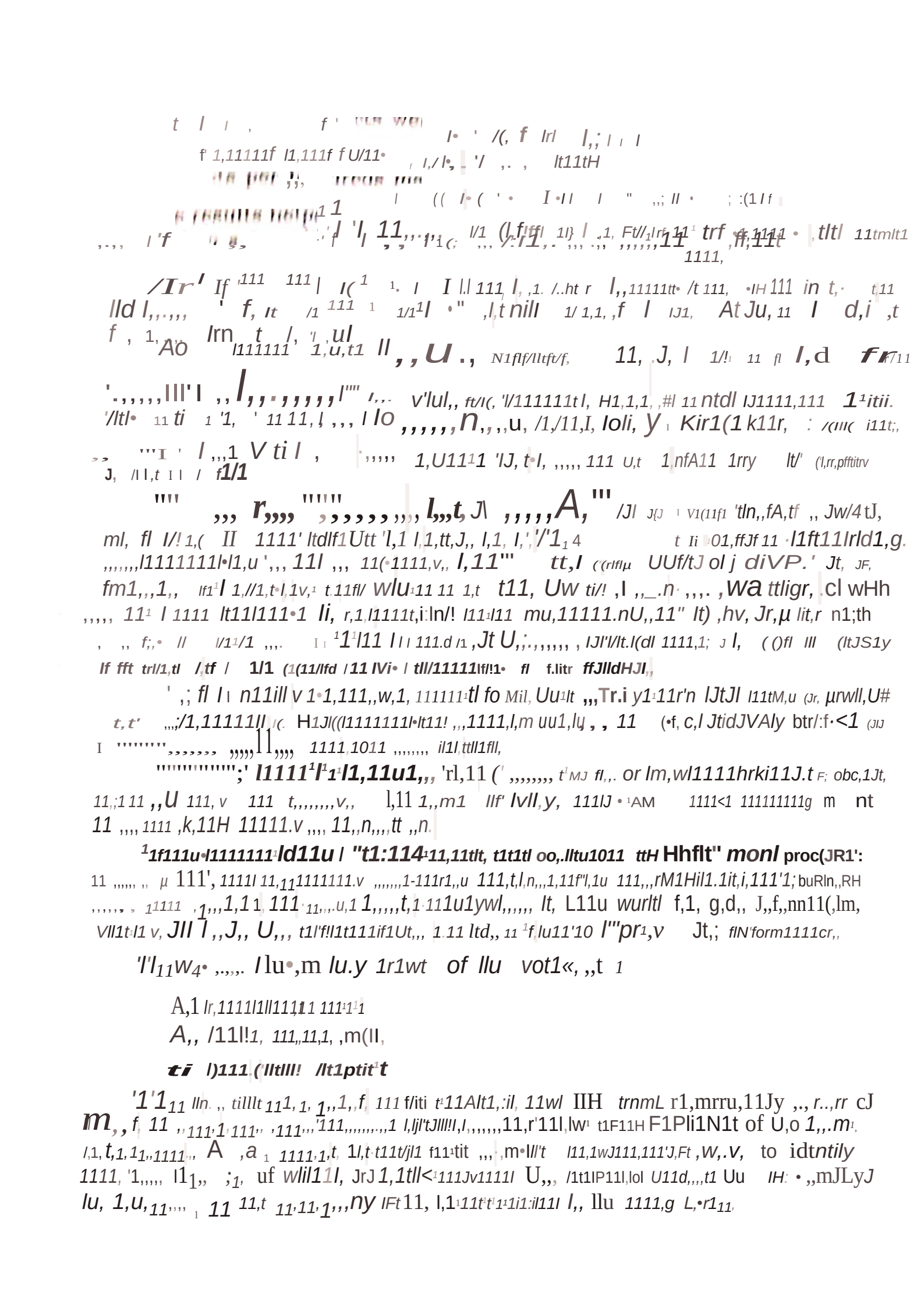
Benchmarking

Successful companies in every industry engage in a variety of practices which lead to achievement of high level performance. Benchmarking is one of the most recent methodologies that has emerged in corporate attempts to gain and maintain competitive advantage. **It provides a clear signal of success or failure.** Benchmarking is an effective tool which helps organizations to create quality targets in the strategic quality management process. In the arena of 2000's, benchmarking has become one of the most popular tools of business management, particularly in the Indian Industry.

Benchmarking is a systematic method by which organizations can measure themselves against the best industry practices. **Benchmarking is the search for best practice's that will lead to superior performance.** Benchmarking helps a company learn its strength and '":eak esse and those of other industrial leaders and incorporates the best practices into its own operations.

What is Benchmarking ?

Benchn$_1$arking is defined as "measuring our performance against that of



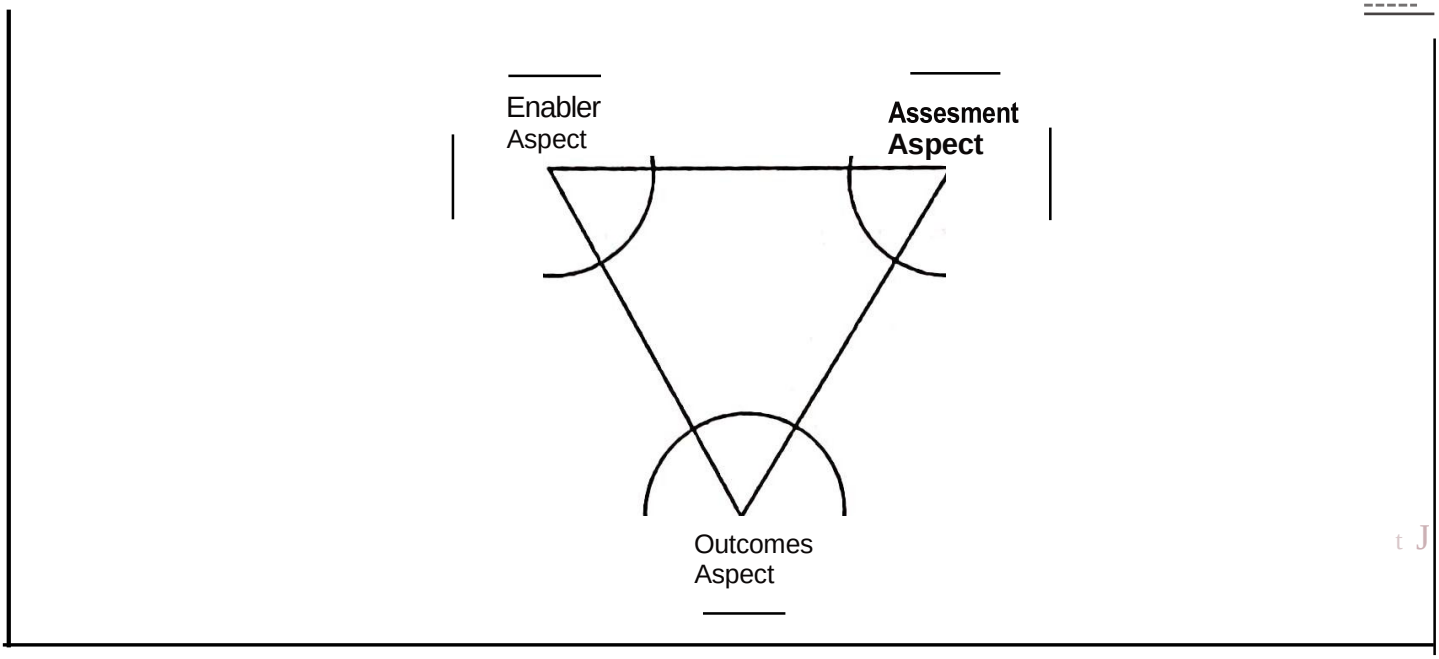


Fig. 9.1. Benchmarking Triangle

'fhe enabling aspect relates to understanding the theory that lies behind the high perforn1ing processes and activities that is, learning about the practices (or activities) which Jead to process performance. It is this deeper level of learning and understanding that lays the'foundation that enables continuous improvement.

The outcomes aspect involves being able to utilize the learning gained through n1astery of the enabling aspect within the firm itself. This requires successfully transferring the best practice. It is essentially about implementing best practices in house. Often, adoption of best practice require adaptation of the 'enabling practices' to the context and culture of indigeneous organization.

ADVANTAGES OF BENCHMARKING

Benchmarking can benefit a company in several ways. Some of **the major advantages of the benchmarking are as follo,vs** :

I. The 1najor advantage of bench1narking practice is that it promotes a thorough understanding of the company's own processes *i.e.* the company's strength and e nesses is well understood.

2. Intensive studies of ex t ng practices often lead to identification of non-value a<lded acti .i ,and plans from process improvement:

3. It assists the company !I\ atta ining a competitive position.

4. It helps in meeting _mo e effectively the end user or customer requirements.

5. Benchmarking supports in establishing goals based on concerted view of external conditions.

6. Benchmarking allows o'rganizations to set realistic, rigorous new performance targets and this process helps to convince people of the

7. Benchmarking allows organiz t· and to elect the processest a. ton to define specific gaps in perf?nnance its products and . o improve. It enables the company to redesign services to achiey e ou[comes th]at meet customer expectations.
8. Benchmarking helps in b • ecoming aware of and searching for industry best practices.
9. It improves_ the overall quality of the system.
10. b Benchmarking provides ab as1s fi or tra1m ng human resources. Employees egin to see_ the gap between what they are doing and what best in class are d01ng.

LIMITATIONS

1. The main liI itation of benchmarking is the fact that best- in-class performance 1s not a static but a moving target.
2. enchmarkin is notaninstant pudding. It will not improve performance if the proper infrastructure of a total quality program is not in place. Unless a corporate culture of a quality and the basic components of TQM such as information system, process control and human resource prograr :unes are in place, trying to initiate the best-in-class may very well disrupt operations.
3. Conflicting objectives of the organization and those of its benchmarking partners.
4. Lack of Planning, Focus, priorities, leadership will affect the objective of benchmarking.

VARIETIES OF BENCHMARKING

There exist number of varieties of benchmarking. A few of them are described below :

1. Internal Benchn1arking. Internal benchmarking is the easiest to conduct since data and information should be readily available. It involves measurement and comparison of activities, functions, and processes within the same organization.

· **2. External Benchmarking.** It involves comparison of similar operations systems, processes with external organization.

3. Competitive Benchm king. I_t. iny'olves analyzing the performance practices of best-in-class companies. Their performance becomes a benchmark to which a firm can compare its own performance and their practices are used to improve that firm's practices. However the data collection may be different to obtain because it is impossible to get the competitor's secrets. It is only possible through confidential surveys or by some third party consulting firm.

"'· **Industry Benchmarking.** It involv s c mparisons with a group larger than the direct competitor *(i.e.* other organizat10nal player such as supplier,

TOTAL EMPLOYEE INVOLVEMENT

Learning Objectives

After reading this chapter, the students ,rill be able to answer the following questions.

- >- "orker s Participation in ManRo<re.ment..
- > To al Employee In,-ol,·ement Concepl
- > Team Building : Needs and Benefits.
- > Quality Circle : Concept
- > Need and Characteristics of Quality Circle
- > Education and Training of Employees
- > Various Rewards and Recognition for Quality.

WORKER'S PARTICIPATION IN MANAGEMENT

Introduction

Human relations school of managen1ent thought is generally credited with the evolution of the concept of 'Industrial Democracy'. Elton 1-Iayo. John Dewey, Kurt Lewin, F.J. Roethlisberger and \V.J. Dickson suggested participation of Workers in management for better productivity. They were of the opionion that the amount of work done bJ a worker is not detern1ined by his physical capacity, but by the social norms. Non-financial rewards play an important role in determining tho motivation and happiness of the workers. ,vorkers do 11ot react to management and its norms and reward us individuals, but as members of

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INDUSTRIAL DEMOCRACY

'rho concept of induRtriol democracy ie o complete dopnrturo from the trncfitimml concopt·of uutoroctic munar,emcnt or ono-mnn rule. It means *the application. of dcmocratir. principles in mana}lin{l industrial units.* rt is a eupplomcnt of politicul democracy in which ull ci,tizone ore treated equal and uro ullowcd to pnrticipoto frooly in tho offnira of tho Sta to indirectly, *i.e.*, through elected roprosontativos. In induutrial domocracy, workers ore treated *as* rottponRibJo purtnorH of on ontcrpriso nnd ore aJJowod to participate in the docieion-moking procoss through cJiffcront methods. Workers ore {,riven the right of 1:w)f-oxprossion cmd cm opportunity to communicate their vicwR on *framing* tho policiuH of tho company.

Tho sullcnt fcnturc111 of Jndustriol democracy ore 011 under :

(i) Tho workers oro trootcd 11s partners in tho productive procCBs nnd ore 1:ivo *an* opportunity to pnrticipato in tho mnnagc:mont.

(ii) Works Cmnmittees, Joint l\1anagement Councils, and Suggestion Schen,es are smne methods throuo-h which industrial democracy can be? introduced at the unit level.

(iii) \Vorker's parti_cipation is generally indirect, *i.e.,* through representatives on al o rcs ricted to certain aspects of management particularly those wluch nre directly related to workers.

(iv) 'fhe workers enjoy higher stat.us as they have an effective say in the working of the enterprise •Nhere they are working.

Merits of Industrial Democracy

Industrial democracry is expected to bring about the following advantages:

1. Industrial democracy brings an effective communication between workers and management, and thereby joint decisions &cceptable to both parties are possible.
2. Industrial democracy leads to cordial labour-management relations and industrial peace.
3. Industrial democracy gives higher status to workers and makes them more responsible in their outlook and beh viour.
4. Industrial democracy gives training in.democractic norms and traditions to workers through participationg in the affairs of their company. This develops the spirit of tolerance and co-operation which is useful in a democratic society. This creates tru democractic spirit in the minds of workers and makes political democtacy strong and stable.
5. Workers feel committed to the decisions taken by them jointly with the management.

Pre-requisites of Industrial Democracy

The concept of industrial democracy is an ideal one, it is very difficult to put it into practice particularly in a developing country like India.

The conditions necessary for industrial democracy are as under:

(i) There should be a strong trade union with constructive leadership in every enterprise.

(ii) The employers should have the willingness to treat workers as equal partners in industry.

(iii) All the parties to industrial relations, namely, employers, employees and government should have full faith in industrial democracy. "Industrial democracy will not succeed unless all concerned workers, employers, government and the public fully realise its importance and its due place in the national life. .,,-

(iv) The workers and management should .have the genuine desire to deal with the industrial problen1s peacefully and through democractic means.

WORKERS' PARTICIPATION IN MANAGEMENT

There are two distinct groups of people in an undertaking, *viz.*, 'manager's and 'workers' performing respectively two separate sets of functions which ure known :ts 'l\1anagerial' and 'Operative'. The basic distinction between those who occupy nanagerial positions and workers is that 1nanagers are held accountable for the .vork of their subordinates, while workers are accountable only for their own work. The extent to which workers may rise to become n1anagers is though an important point, but is quite distinct from whether workers may take part in n1anagerial functions.

lvianagerial functions are primarily concerned with planning, organising, motivating and controlling in contrast with operative work. *A* self-employed man may carry out both these functions if the area of his operation is very small. But in case of a big organisation, these functions are to be performed by different sets of people. Workers' participation in management seeks to bridge this gap authorising workers to take part in the managerial process. Actually, this is a very wide view of the term worker's participation in management and this is not partically possible. This issue has been discussed later in this chapter.

Participation may take two forms. It may be : (1) Ascending participation, and (2) *Descending* participation. In case of ascending participation, the workers may be given an opportunity to influence managerial decisions at higher levels through elected representatives to Joint Councils or the Board of Directors of the company. But in descending participation, they may be given more powers to plan and to make decisions about their own work *(e.g.* delegation and job enlargen1ent). This form of participation is quite popular in many organisations.

The Concept of Participation

Participation philosophy is difficult to understand and even more difficult to develop in a group. The concept is shrouded with so much vagueness that for different people it has different n1eanings. This term is interpreted in many ways by various parties to industrial relations, namely, workers, management and government. Managers generally interpret it merely as *joint consultation prior to decision-making.* This is a very narrow view of the term participation. Workers normally think of it as equivalent to *co-decision or co-determination in the spheres : of ,nanagerial functions.*

Many industrial relations experts regard it as an *association of labour with ,nanagement* without the final authority or responsibility in the general area of n1anagerial functions. To them, it means sharing in an appropriate manner the decision-making power with the lower ranks of the organisation. Thus, *workers participation in managment means giving scope for workers to influence the mann.PPrin.l decision-makin process at different levels by various forms in the*

orga11isa io11. Th_e p1:iI cipal forms. through which workers participate are information shanng, Jmnt· consultat10n and suggestion schemes.

Objectives of Workers' Participation in Management

\Vorkers participation in management is recommended to achieve the following objectives :

1. Increasing productivity for the general benefit of the enterprise, the employees and the community.
2. Giving en1ployees a better understanding of their role in the working of the industry and of the process of production.
3. Satisfying the workers urge for self-expression.
4. Achieving industrial peace, better relations and increased co-operation in industry.
5. Development of human personality.
6. Development of positive leadership within the industry.

Thus, workers participation in manaiement is inevitable in industry. In the words of V.V. Giri, Such an association of labour and management at all levels would lead to promotion of increased productivity for the general benefit of the enterprise, the employers and the community, giving employees better understanding of their role in the working of the industry and in the process of production, satisfaction of the urge of self-expression in employees, thus, leading to industrial peace. Better relations and increased cooperation will enable employers to win their confidence and cooperation. Such association of labour with management in a real way at all levels will break the barriers between labour and management and do away with suspicion and mistrust.

Need and Importance of Worker's Participation

: Worker's participation in management has assumed great importance these days because of the following advantages.

I. **Reduced industrial unrest.** Industrial conflict is a struggle between wo organised groups which are motivated by the belief t at their respective interests are endangered by the self- interested behaviour of the other. Participation cuts at this very root of industrial conflict. It tries to remove or atleast minimise the diverse and conflicting interests between the parties, by ubstituting in their place cooperation, hon1ogeneity of objectives and common Interests.

2. Reduced misunderstanding. Participation helps dispelling ernployee's lll sunderstandings about the outlook of mana ement i? industry. These llisconceptions would otherwise die hard, and their damaging effect needs no emphasis. In addition, the difficulties which management encounters in lllanaging the enterprise will be appreciated by the employees.

Nature of Workers' Participation

A review of management literature on participation reveals that (since Elton Jayo first advocat ed t.he idea) three scho ols of thought hnv P- emerge,1. *The fi st* looks at part.Ic1pat10n as a process of decision-making in which subor<lmates re allow d. to ave a 'say' in or "to influence" tho decision-making. *The second* views parhc1pat10n as actual decision-making by the workers and not merely having a "say" in it or influencing it. *The third* views it as a process in which s,ubordinates exercise 'control' on decision-making mechanism.

A brief exposition of these three schools of thought is given below :

l. Influencing through information sharing. According to the first view, participation takes place when the management solicits the opinion of workers before taking a decision. In other words, management merely prm·ides *an opportunity to the workers for 'influencing' or 'having a say' in decision making.* The decisions are ultimately taken by the management. Thus, the workers play *passive role* in the process of decision-making as they have no final say in the decisions taken by the management.

2. Joint decision-making. This school holds that participation of an individual in something occurs when he actively takes a part in that thing. The focus here is that there must exist "taking part actively". It is this point that this school differs from "influence" interpretation of participation. In case of 'influence' or 'having a say', the participation is of passive nature. But in case of joint decision-making, *the workers are active participants in the process of decision-making.* Their representatives sit across the table with the representatives of management to take important decisions particularly on matters affecting the workers. Workers may be members of Works Committee, Joint :Management Council, ·etc, alongwith the representatives of management. Tho decisions are taken through mutual discussions between the representatives of the workers and those of the management.

3. Self-control. The essential feature of self-control (or self- management) is that management and workers are not visualised as tw.o distinct groups but as active members with equal voting rights. Every member participates right from decision-making to execution of decision. Participation in Yugoslavia is an example of self-control. *Self-control implies a process in which the workers exercise control on the mechanism of decision-making as full-fledged and active members.* This view of worker's participation implies formal involvement of Workers at all the stages of the decision-making process. This is possible when they are treated as co-partners in industry. V.G. Metras has defined worker's participation in management as sharing *the decision- making power by the ranks of an industrial organisation, tlu:ough the!r proper representa ives, at all appropriate levels ol management zn the entire range of managenal action.*

Of th • thr ı inLt rprct11tior1H of pnrticiputionn t{ivon ohovc, the int<.:Tpretation m phuHiHi ni: c mtrol iH mont UH ful nu comp1Jrcd to tho other two. Ii iH morr: prcciHo nncJ m •nningful thon un interpn.:toiion Hk ı 'Ruy' 011cJ huR bro;Hfor impli otions Lhnn 'HhurinH*UP* •iflion•inuking'. l'urticipntion moy, thuH, h<! dcf!crihnij n n proc MA wh •rchy Huhrodin1JtcH ure uhlc to participate ;n dccision-mrtking ot nll lf'v<-IHof th ntcrpriHe. '/'he *conc:cpt of worleeru purlicipatinn in rnanu11ement crystal/is ·s tlw concept of indrLHtrial democracy und indirect11an attempt un llw part nf nn employer tu build hiH employe,11J into a team which workIJ toward the rcnlfr.mtion uf a cnmmrm nhjcctiuc.*

MODES OF PARTICIPATION

Purticipntion of worl<crff in management of industrial enterprise,, iH nchicvcd by the following mcthodH :

1. \VorkH Committee. A WorkR Committee consists of equal number of rcprcscntativcRof both emp)oy<!rH and workers. It meets frequently for diRcussion on common prohlcms of the workera and the management. After di,;cussion, joint decisionHarc taken and are binding on hoth the parties. Mattera like wage payment, bonus, training, discipline, etc. arc cliacuRsed in such meetings. Work CommittceR arc extremely popular and effective in France and also in England. In India, there iR a statutory provision for the eMtahlishment ofWorkB Committees under the Industrial DiRputcs Act, 1947. Such Committees deal with various matters like amenities to workcrR, safety and aCQdent prevention, administration of welfare funds, educational and recreational facilities, etc. However, the Work.a Committees have not proved to be effective in India.

2. ,Joint Mnnagcmcnt Council .. Joint consultation scheme was started in the UK with the formation of Whitley Councils (Workers councils, District councils and Nationul councils) on the recommendations of the Whitley Committee which wus appointed by the British Government to recommend measures for the permanent settlement of differences between the workers and the manog mcnt. Joint consultation involves setting up of Joint committees represented hy the workers *and* the management to discuss and give suggestions for improvement with regard to matters of mutual interest. The decisions of Huch committees arc not binding on either party, yet they are implemented *aR* they *are* c.1rriv d at by mutual conaultationH. The subject-matter of joint consultations incJudcs Emch problem areas *aR* labour welfare; safety measures, grievance rcdrc:,;al, training,. working hours, etc. Matters relating to wages, aR th<!y ar ! cons1dm-cd appr natc for bon s and incentive schemes are generally Jwpt ()ut,,ucJe the 1,cope of Jomt con6u)tat10n coJlective bargaining.

a. CoJlcctivc Bargaining. H is an industrial relations process in which c-rnploy<!cff thr<,ugh their clcctccl Jcode:rs participate on equal basis with

11n1wgcment itnogot_inting lnbour ngrccmonts, in udministoring the ugrcements, ,,nd in rcdrcs mg gr1ovnncos of tho wof'lrnrs.

-1. ?0-J>urtncrship. fn co-purtnorship, workers nro aJJowecl to purchuBe shnrc of the compnny. In this woy, they cun participate in the management of the company through their cloctc<l rcpresentntivcs. As sharoholclors, the workers can nlso attend general meetings of shareholders and exorcise their voting rights.

5. \Yorker-Director. Should labour association with management result in n worker's representative being given a seat on the Board of Directors ? Many trade unionist have themselves pointed out such an idea is i11ogical. In countries where the trade unions arc very strong as in Britain and U.S.A., the trade unions definitely reject the idea. This, according to them, would simply cause a confusion of roles and that the unfortunate worker-director would not be able to reconcile his position as a trade unionist representing the workers interest with himself being a member of the management. Once the worker director identifies himself with the cause of management either at the top level or down the line, he cannot act contrary to the management's decision because of the principle of collective responsibility in the management. Thus, he wiII not be in a position to defend his role as a worker's representative. A worker-director would be in a minority and thus his views would carry little weight with the Board. Moreover, the worker-director is not properly traine in the management function. Though he is an effective leader, he may not necessarily be an effective manager. As he lacks the qualities of a good manager, he will only hold an obstructing view. He may not be in a position of judiciously determining the short-term and long-term effects of a new proposal, *e.g.* raising funds to finance a new project. Since the worker-director is the representative of a trade union, he will always take a biased view for the benefit of the workers. He may overlook the interests of the organisation which has certain obligations towards the society. The worker-director will merely act as the mouthpiece of the union -which is not desirable. But again, as the director is in a minority, his voice wi11 have no effect; so he may feel inferiority complex or he niay be completed suppressed or frustrated and may even create nuisance for the company. That is why trade unionists wish to maintain their independent status and this way they can better act as a check on the management.

6. Suggestion Scheme. Under suggestion scheme, the workers are encouraged to give their suggestions to the management on various administrative matters, and their suggestions are considered carefully and accepted, if found suitable. In addition, rewards are also given *to* those who make constructive uggestions. For coilecting suggestions of workers, suggestion boxes are kept In all departments. The workers may put their suggestions in writing into the box. These suggestions are collected every month and suitable decisions are

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tiil The workersmu[st] hn\ en strong trade union with enlightenedleadership. Th r n[1]ut .hove thewillingness to participute in the monngcmont of the enterpnse.

iii) lanage e t. t nd workers must understanci clearly the objectives of urh part1cipation. l'vlanagement should not take it on as imposed liability and workers should not use it for expressing their grievances and demands only.

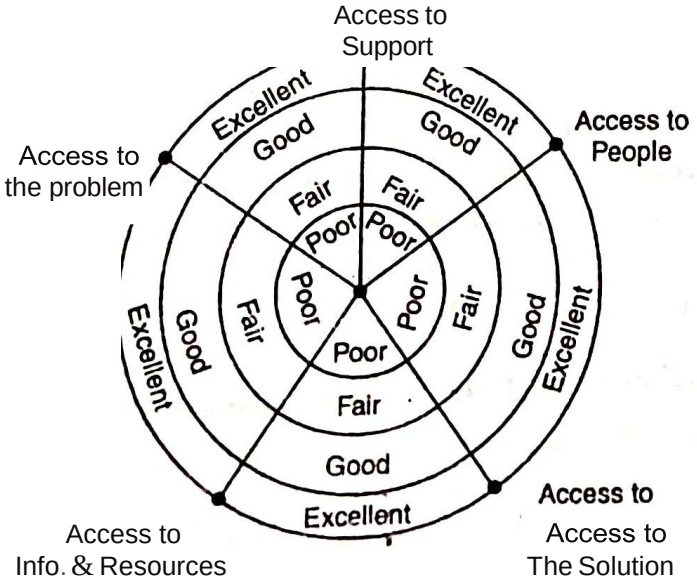
lit Existence of at1nosphere of trust, faith, confidence and recognition is *a* n1ust as faith is the *sine qua non* of co-operation. There must be a genuine desire on the part of 1nanagement and workers to understand each other to arrive at decisions acceptable to both the parties.

i. Labour-n1anagement relations should be cordial or at least there should be not tension in the relations. There should be no blockage in communication between them.

(vi' For successful participation, it is necessary that employees are sufficiently informed about participation programme and they are given proper training in the field. They must be taught just what is expected of then1 and how they are expected to perform.

Employee Involvement - Access Management

Have you ever been involved in an employee involvement program that failed to meet the expectations of management and employees ? Did employees feel that management's efforts were disingenuous ? Did they become disenchanted or refuse to help ? Dr. Hall's theory of Access Management holds the key to making employee involvement work.



. Dr. Jny Hn11's vnlirlutcd th ¹ory <.lcscribcs how Access is the key to crnplo ¹nvolve1nent. It mak s tho diffi r nee between more lip-service and n gcnu ee opportuntl:) for poop} to ollubornte. After management h as created openin ¹ne to get cn1pl ye involved, tho second criticol tnsk is to manage **Accc$_{88}$,** g

Tire Sta,· illodel of Access Jlla11 age111ent **measures the amount r acccs given to employees nlong five critical supports for involvcrncn .**

l. Access to The Problem

Arc th problems you are assigning to employees are "Real" problems? Exploye n1ust hn, e access to the problems o opportunities affecting thei **work.**

2. Access to People

Do you crent unneeded barriers to the people that are affected by or conti;butc to the problem. People need access to those who can lend additional insight into the problem. These people may be in another department, another industry, or may even be outside consultants in some circumstances. People need access to them for purposes of critique and searching for more acceptable alternatives.

3. Access to Information and Resources

Do you create unneeded barriers to the information or resources that may be critical to get the job done ? Is too much of your information considered *'4for management's* eyes *only".* Lack of access to needed information will not, only frustrate people's efforts, but also undermine their emotional investment in the employee involvement process.

4. Access to Support

Do you actively provide the needed emotional, procedural, and policy supports needed to ensure your employee involvement process a productive one.

5. Access to the Solution

While it may seem obvious an invitation to people to work on a problem or opportunity includes coming up with a solution, many managers drop the ball at this point. *Are* you committed to implementing, or at least testing, the ideas your employees come up with or are you simply going to take it under advisement ? Nothing will squash an involvement process more that not committing to their ideas in some w; y and may very well hinder you from ever getting them involved again.

Employees' involvement in Total Quality Management (TQM)

Total Qualit): ·Man:ac_ement is one of the major "workplace change" program,nes used z.n Britain, but few studies have addressed the effects on emp oyecs. New re ear IJ. evidence questions optimistic and pessimistic account;: finding that TQM zs widely welcomed but that it dtJes not lead to "empowerment and that success depe,ids 011 *c rtain conditions, notably job security.*

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fbe context of Total Quality Management

Tot.al u.ality Management (TQM) has been a leading development of the 1990s inBntain.Su:"eys find that almost three-quarters of organisations claim o havef al quah_ty pro mmes, which are believed to work by increasing eaiployee interest [1] t e[1]r Jobs and their understanding of how their work contribut.eB_ to organisatrnnal goals. Many of these programmes have been iouocJuced 1n thepast five years. Definitions of TQM vary but its core comprises :

> a focus on the customer

> the improvement and inter-linking of business processes; and

> continuous improvement.

Analysis falls into two main types :

> Optimistic texts, which often prescribe ways of implementing TQM and assume a welcome from employees; and

> Critical studies, which either (a) equate TQM with intensified managerial control under the pretence of "empowerment', or (b) accept that TQM can be effective, but argue that in practice poor implementation has undermined this promise.

The critical studies often argue that TQl\1 undermines the representative role of trade unions by strengthening direct links between employer and employes.

New research evidence

A new report - "Involving Employees in Total Quality Management", M. Collinson, P. Edwards and C. Rees, London, Department of Trade and Industry <March 1997) - published by the Department of Trade and Industry, challenges both these lines of argument.

Drav.ing on interview and questionnaire data collected in 1995 from Bix named organisations, it argues (a) that employees ,velcome some hut not all features of TQM, (b) that existing accounts have an unduly strict benchmark for the effects of TQM, and (c) that success depends on certain conditions.

(a) Employee views. More than four-fifths of the sample of employees saw quality as the crucial issue for their organisations or as very important. Almost two-third felt that employees had a "great deal" or a "fair amount" of nfluence over quality, and over 70 per cent felt that their own involvement [1]n problem-solving had increased. Five employees in six identified the presence of meetings designed for problem-solving.

Of the sample, 72% felt that there had been an increase in communication activity recently. The most favourably evaluated methods was team briefly, folJowed by informal communications with individual managers. It was direct, f&ce-to-forp rmnm11n1r. tion which employees most valued.

MALCOLM BALDRIGE
NATIONAL QUALITY AWARD

Who was Malcolm Baldrige ?

l\1nlcohn Bnldrige was Secretary of Comn1erce of U.S.A. from 1981 until his death in a rodeo accident in July 1987. Baldrige was a proponent of quality management as a key to this country's prosperity and long-term strength. He took personal interest in the quality improvement Act that waseventually named nfter hi1n and h lped draft one of the early versions. In recognition of this contributions, Congress named the award in this honour.

What is the alcolm Baldrige National Quality Award ?

The Baldrige Award is given by the President of the United States to business - manufacturing and service, small and large - and to education and health care organizations that apply and are judged to be outstanding in seven areas : Leadership, Strategic planning, Customer and market focus, Information and analysis, Human resource focus, Process management, and Business results.

Congress established the award program in 1987 to recognize U.S. organizations for their achievements in quality and performance and to raise awareness about the importance of quality and performance excellence as a competitive edge. The award is not given for specific products or services. Three awards may be given annually in each of these categories: Manufacturing, Service, Small business and, starting in 1999, education and health care.

While the Baldrige Award and the Baldrige recipients are the very visible centerpiece of the U.S. quality movement, a broader national quality program has evolved around the award and its criteria. A report, Building on Baldrige: American Quality for the 21st Century, but the Private Council on Competitiveness, said, "More than any other program, the Baldrige Quality Award is responsible for making quality a national priority and disseminating best practices across the United States".

The U.S. Commerce Department's National Institute of Standards and Technology (NIST) manages the Baldrige National Quality Program in close cooperation with the private sector.

Why was the Award established ?

In the early and mid-1980s, many industry and government leaders saw that a renewed emphasis on quality was no longer an option for American companies but a necessity for doing business in an ever expanding, and more

d_enrnnding, competitive world market. I3ut many Arnerican business organizations ;[1]ther did not believe quality mattered for them or did not know where to begin. fhe Bn1drigc Awurd wns envisioned ns a standard of excellence that would help U.S. organizations nchieve world-class quality.

How is the Baldrige Award achieving its goals ?

The criteriu for the Baldrige Award have played a major role in achieving the goals established by Congress. They now are accepted widely, not only in the United States but also around the world, as the standard for performance excellence. The criteria are designed to help organizations enhance their competitiveness by focusing on two goals: delivering ever improving value to custon1ers and improving overall organizational performance.

Malcolm Baldrige National Quality Award

The award program has proven to be a remarkably successful government and private-sector team effort. The annual government investment of about $5 million is leveraged by a contribution of over $10 million raised by private industry to help launch the program and the time and efforts of hundreds of largely private- sector volunteers.

The cooperative nature of this joint government-private sector team is perhaps best captured by the award's Board of Examiners. Each year, more than 300 experts from industry, educational institutions, governments at a11 levels, and non-profit organizations volunteer many hours reviewing applications for the award, conducting sites visits, and providing each applicant with an extensive feedback report citing strengths and opportunities to improve. In addition, Board Members have given thousands of presentations on quality management, performance improvement, an the Baldrige Award.

The Baldrige Award winners also have taken seriously their charge to be quality advocates. Their efforts to educate and inform other companies and organizations on the benefits of using the Baldrige Award framework and criteria have far exceeded expectations. To date, the recipients have given more than 30,000 presentations reaching thousands of organizations.

Baldrige Criteria

The Baldrige performance excellence criteria are in framework that any organization can use to improve overall performance.

Seven categories make up the award criteria :

Leadership. Examines how senior executives guide the organization and how the organization addresses its responsibilities to the public and practices

Strntcgic pla_nning. xamines how the organizations sets strategic directions and how 1t determines key action plays.

Customer and mark t focus. Examines how the organization determines requirements and expecta ions of customers and markets; builds relationship ,rith custon[1]ers; and acquires, satisfies, and retains customers.

Measuremen.t, analysis and knowledge management. Examines the nuinagement, effective use, analysis, and improvement of data and information to support key organization processes and the organization's performance management system.

Human resource focus. Examines how the organization enables its workforce to develop its full potential and how the workforce is aligned with the organization's objective.

Process management. Examines aspects of how key production/delivery and support processes are designed, managed, and improved.

Business results. Examines the organization's performance and improvement in its key business areas : customer satisfaction, financial and marketplace performance, human resources, supplier and partner performance, operational performance and governance and social responsibility. The category also examines how the organization performs relative to competitors.

The criteria are used by thousands of organizations of all kinds for self-assessment and training and as a tool to develop performance and business process.

For many organizations, using the criteria results in better employee relations, higher productivity, greater customer satisfaction, increased market share, and improved profitability. According to a report by the Conferenc,e Board, a business membership organization, **"A majority of large U.S. firms have** used **the criteria of the Malcolm Baldrige National Quality Award for self-improvement, and the evidence suggests a long-term link between** use **of the Baldrige criteria and improved business performance".**

Baldrige Award in Service Sector

Both categories were introduced in 1999.

Any for-profit or non-for-profit public or private organization that provides el ucational or health care services in the United States or its territories is e l gi'b le to apply for the award. That includes elementary and secondary schools :.nd schools districts; colleges, universities, and univ rsity system; schools or a l eges within a university; professional schools; community; technical schools; c . _charter schools In health care, it includes hospitals, HMOs, long-term-care c aciht,i es, h ealth ca re pract it 0 ner offices, h ome h ea Ith agenci es, h ea 1 th insurance oinpa nies, or medical/dental laboratories.

> Ricba_r °:ling, C O, Premier Inc., a leading dis ributor of health care supplies, 1a 6eTV1ng as President of the private- sector Baldrige Foundation during 2001.

Need in Education and Health

Since its creation in 1987, the Malcolm Baldrige National Quality Award has played an important role in helping thousands of U.S. companies improve not only their products and services, their customers' satisfaction, and their bottom line, but also their overall performance.

Now, organizations in other sectors vital of the U.S. economy - education and health care - are recognizing that the Baldrige Award's tough performance exceJlence standards can help stimulate their improvement efforts *as* well. Just as it has for U.S. businesses, Baldrige Award program can help these organizations to improve performance and foster *communication,* sharing of "best practices", and partnership among schools, health care organizations, and business.

Selection Process

Organizations that are headquatered in the United States may apply for the award. Applications for the award are evaluated by an independent Board of Examiners composed of primarily private- sector experts in quality and business. Examiners look for achievements and improvements in a11 seven categories.

Organizations that pass in initial screening are visited by teams of examin rs to verify information in the application and to clarify questions that come up during review. Each applicant receives a written summary of strengths and areas for improvement in each area addressed by the criteria.

"The application and review process for the Baldrige Award is the best, most cost-effective and comprehensive business health audit you can get", says Arnold Weimerskirch, former chair of the Baldrige Award panel of judges and *vice* present of Quality, Honeywel1, Inc. It should be noted that only U.S. or its territories can apply for this award, including subunits of foreign companies.

Is the number of applications for the award an indicator of interest about quality and the Baldrige Award ?

The number of applicants for the national Baldrige Award is not an indicator of overall interest in quality or the award program. Interest continues to grow both nationwide and internationa11y.

For example, participation in State and local award programs has increased steadily. In 1991, fewer than 10 States had award programs. Now, 44 States have or are establishjng award programs. Most are modelled after the Baldrige Award and many organizations opt to compete for them first before considering a Baldrige Award application. Many of the Baldrige Award recipients also have Won State Quality awards.

5S Overview

1. Clearing (SEIRI)

Meaning

Distinguish between the necessnry nnd the unnecessary, and getting rid of what you do not need.

Aims

- '!!- Establish criteria and stick to them in eliminating the unnecessary.
- > Practice stratification management of set priorities.
- > Be able to denl with the causes of dirt.

Activities

Eliminating the unnecessary.

- > Dealing with the causes of dirt.
- > Kaizen and standardization based on fundamentals.

Principles

Stratification management and dealing with the causes.

2. Organizing (SEITON)

Meaning

Establishing a neat layout so you can always get just as much of what you need when you need it.

Aims

- >- A neat looking workplace
- > Efficient (including quality and safety) layout and placement.
- > Raising productivity by eliminating the waste of looking for things.

Activities

- >- Functional storage based upon the 5W's and the lH.
- >- Allocate place for each and every item.
- > Arrange visuals to identify items and locations.
- > Establishing easy replacement methods.

Principle

Functional storage and eliminating the need to look for things.

S. Cleaning (SEISO)

Meaning

Eliminating trash dirt and foreign matter for a cleaner workpiece. Cleaning as n form of inspection.

AfntS

- A degree of cleanliness corresponding to you needs. Achieving zero grime and zero dirt.

> Finding minor problems with leaning inspections.

Preventing the dirt at the source itself.

Inspecting equipment and remedial action.

Principle

Cleaning is for inspection, elimination of breakdown and defects.

4. Standardization (SEIKETSU)

Meaning

Keeping things organized, neat, and clean, even in personal and pollution related aspects.

Aims

> Management standards for maintaining the 5S's.

> Innovative visible management so that abnormalities show up.

Activities

> Innovative visual controls.

> Early detection and early action devices.

Manuals for maintaining standardization.

Color Coding

Principle

Visual management and 5S standardization.

Discipline (SHITSUKE)

caning

Doing the right thing as matter of course•

.\!ms

Full participation in developing good habits and follow the 11.!les.

Communication and feedback as daily routine.

Activities

> Five-minute 5S

- Communication and Feedback
- Individunl Responsibility

> Practicing good habits.

Principle

Habit formntion nnd creating a disciplined workplace.

CENTRAL SCIENTIFIC INSTRUMENTS ORGANISATION, (CSIO) CHANDIGARH

ISO 9002 Certification to CSIO

ISO 9000 quality system aims to achieve quality standards for improving management system and assurance for customer's satisfaction and cost effectiveness. The standards are the real internationally agreed guidelines for managing quality system and enables to select quality management model as ISO 9001, 9002, 9003 or 9004. The selection of the model depends upon the nature of the product, production, process and above all costumer's need.

1SO-9000 : Quality management and quality assurance standards.

1SO-9001 : Quality Systems model of quality assurance in design development, production, installation and servicing.

1SO-9002 : Quality system aims at preventing and detecting any non-conformityduring production & installation and implementation of the means to prevent the occurrenc of the non- conformity.

ISO-9003 : Quality System specifies the features of the quality system where the contract requires demonstration of the capacity to detect and control the disposition of any product non- conforming during final inspection and test.

ISO-9004 : Quality management applies to non-contractual situations. It describes a basic set of elements by which a supplier may develop and implement quality management systems.

The structure of ISO 9001 remains unchanged and the clause heading in ISO 9002 and 9003 have been aligned with ISO 9001 these headings are common to nil standards.

Benefits of ISO Systems

ISO quality Systems brings various benefits, inspire confidence, achieve customer satisfaction nnd cost effectiveness. It confirms the following benefits.

It enables the1n to identify, plan tasks and their method of performance in order to yield the right results.

- > It provides means for identifying, resolving problems and preventing there recurrence thereby improving conformance.
- > It enables the staff to control its own operations and help to create quality awareness, job satisfaction among themselves.
- > It provides a means for documenting the con1panies experience and thus improve their performance.
- > It provides data that can be used as an indicator of performance level.

Preamble

In October 96 - Dr. H.R.Bhojwani, Head R&D Planning & business Development group (CSIR), expressed that CSIO, Chandigarh has been chosen as one of the 10 laboratories to undertaken certification for ISO-9002 within two years. Efforts were made to formulate the relevant documents under the esteem guidance of Shri C.L. Kaul the then Director, ETDC, Mohali. Due to superannuation of Management representative the documentation work could not be completed.

With the distinct vision of director, Dr. R.P Bajpai the certification of ISO 9000 was once again initiated. The documents_ such as Quality Manual, Executive Procedures and Operating Procedures were once again updated and completed. In October 2001 formal application for certification of ISO 9002 was submitted for certification to STQC certification services, ?\'linistry of Information technology, New Delhi.

The assessor/audit team visited the organization number of times to improve the quality system through audits and surveillance. It was a matter of great honor and pride that on 18th March 2001, CSIO obtained ISO 9002 Certification for the three divisions namely CM\V, STC, S & C D. It was the sincere efforts, dedication and contribution of hard work for achieving ISO 9002 by the internal auditors and senior functionaries of CSIO.

. ISO 9002 certification has improved the institutional image by analyzing [1]tsperformance, defining the responsibilities and authorities of the functionaries and also documenting institutional experience with time.

Institutional quality policy

t CSIO will strive to achieve excellence in quality of products and services Undertaking research, design & ?e:'elopmen_tof s entific & industrial s ruments and components ; prOVId1ng repair, maintenance, testing & calibration services and developing skilled technical manpower in the field c,f instrumentation consistent with professional standards and to users [8]ar[18]faction.

Institutional quality objectives

The Quality Obj ctivos dcfi11cd ore :

1. To undcrtnkc rrn;cnrch, design & dcvcJopmcnt of scientific & industrial instrum nts nnd components conHistcnt with profcssionoJ standards.
2. To ensure technological up grudution nnd improvement in the quaJity of products nnd services including repair, maintenance, testing & cnlibration of instruments to meet the user requirements.
3. To develop skilled technical man-power as a resource for industry and other organizations through high quality education keeping in view the technological advancements
4. To enhance the capabilities of the existing manpower of the Institute through training and re-training in order to keep them abreast with the state-of-the-art technology.

Management representative (Director's Nominee) has close interaction with Director for the functioning of ISO 9002 and seeks his esteem guidance for improving quality system of the organization. Also responsible for documenting quality manual, executive and operating procedures of CSIO, so as to maintain the historical tractability of the institution/organizational activities. The following documents assist the functioning of quality system.

Quality Manual. Quality manual of an Organisation is real/factual document containing the Quality policy, Objective, Mission statements, structural profile, duties and responsibilities of important functionaries.

Executive Procedures. Executive Procedures are the documented procedures for maintaining the quality system of an organization as per the prescribed clauses/norms for the folJowing :

4.1 Management Responsibility
4.2 Quality System
4.3 Contract Review
4.4 Design Control
4.5 Document & Data Control
4.6 Purchase & Store
4.7 Control of Customer Supplied Product
4.8 Product Identification and tractability
4.9 Process Control
4.10 Inspection and testing
4.11 Inspection measurement and test equipment.
4.12 Inspection and test status
4.13 Control of Non Conforming Product
4.14 Corrective and preventive action

4.15 Handling, Storage, Packing, Preservation, & Delivery
4.16 Control of Quality records
4.17 Internal quality audits
4.18 Training
4.19 Servicing
4.20 Statistioal Techniques

Operating Procedures. Operating procedures are documented procedures to make the machine/system operational. These documents are controlled and distributed to the staff members as per the distribution list. Operating procedures are working guidelines and are modified, updated as and when required.

Quality policies used in TATA AUTO COMP SYSTEMS LTD.

QUALITY POLICY

We at TACO-IPD shall strive to continuously exceed the expectations of our customers. We shall achieve this with products, and services that-in quality, cost and delivery-shall be the best in the Indian auto component industry.

To be the best, we shall commit ourselves to excellence in technology and engineering, and we shall inculcate in our organization and in all that we do the core values to siinplicity, frugality, integrity, respect, and harmony.

We shall endeavour to motivate all our employees to uphold this quality policy and excel through teamwork, continuous training, transparency in all activities, and with a participative style of management that cuts across the boundaries of levels and functions.

Further, in all our efforts, qur guiding principles shall be the protection of the environment and service to society.

Employee Profile

The Employee profile of TACO-IPD is shown in TACO-IPD workforce is organized into Engineering & Business Development groups, Operations and Support functions such as HR, Finance and others. All functions employ qualified and experienced personnel in respective areas.

TACO-IPD has a total strength of 482 qualified permanent employee with an average age of 30 years. Employees come from all parts of the country. TACO-IPD also employs temporary and contract employees to manage th fluctuations in the business volumes and handle non-core activities.

Customer Recognition

Ford 01 Received in October 2004

Toyota Kirfoskar Motors Limited
Zero PPM Award for 2003
QCD Award for 2004

GM Supplier of the Year Award 2003 and 2004

ISO 14000 Checklist

ISO 14000

ISO 14000 is the International Standard used for assistance in implementing or improving your Environmental Management System. Many companies, such as automotive manufacturers, various governmental agencies, etc., are requiring their suppliers to obtain third-party registration. ISO 14000 is the specification standard in the 14000 series. It is the only one to be used for their party registrations.

What is an Environmental Management System ?

An Environmental Management System (EMS) is an overall structure that focuses on the short and long term impact of an organization's products, services, and processes on the environment. The EMS ensures order and consistency by guiding the organization in the sharing of resources, assignments of responsibilities, and providing ongoing evaluation of practices, procedures, and processes.

What are ISO 14000 Benefits ?

>- Can provide evidence of reasonable care and regulatory compliance.
>- Focuses on preventive rather than corrective action.
>- Possible reduction of insurance and warranty costs.
> Can conserve energy and materials.
> Can enhance public image and/or market share.
> Possible increased business and trade opportunities.
> Can reduce incidents and liability.
> Help meet vendor requirements.

ISO 14000 has 5 principles

Commitment and policy

- your organization defines your environmental policy and commitment to its E:t\1S.

Policy should include :

- 1nission, vision, core values, and beliefs
- requiren1ents of and communication with interested parties
- continual in1provement
- prevention of pollution
- guiding principals
- coordination with other organizational policies (e.g. quality, OSHA)
- specific regional or local conditions
- compliance with relevant environmental regulations, laws and criteria to which the organization subscribes.

Planning

- how does your organization plan to fulfil your environmental policy.

Planning to include :

- identifying environmetnal aspects and evaluation of associated impacts.
- legal requirements
- environmental policy
- internal performance evaluation criteria
- objectives and targets
- plans and management program

Implementation

- your organization should have or develop the capabilities to achieve your environmental policy, objectives, and targets.

Implementation to include :

- policies
- allocation of resources
- controls and documentation
- training
- accoun ta bility structure
- analysis system
- comn1unication

Measurement nnd cvnluntlon

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  non-conformnnc d t.nils
  supplier informntion
  Ei\IS audits

Review and improvement

- management should continuously improve tho EMS with focus on improving your environmental porfonnnnnco.

Re, iew should include :

> review performance, objectives, and targets
> audit findings
> effectiveness

suitability of policy (based on current conditions)

AWARDS AND COMMENDATIONS

TACO Interiors and Plastics wins TBEM Serious Adoption uncl Highest Delta Awards *November 2005*

TACO Interiors and Plastics, previously known as Tota Auto Plnstic Systems, has received the TBEM Serious Adoption Award for crossing the score of 450 points as per the second cycle of tho external nssessment conducted in 2004. It has also received the Highest De.Ita Award for achieving tho largest rise in the score over the previous assessment. Both these awnrds wore hnnclcd over by Tata Groups Chairman Raton Tata at n function hold in Goo, Indin on 25 November 2005.

Tata Auto Plastic Systems honoured by Gonornl Motors ns supplio•· of the Ycar 2004 *April 2005*

Tata Auto Plastic Systems (TAPS) was aworc.lod for tho socond yoor in succession the General Motors Supplier of tho yeor 2004 in providing Gonornl Moto:s. with parts and services for its ovora]] business porformoncc. 'fhc prest1g10us award was presented in a ceremony conducted on 23rd AprH 2oor, in Detroit, USA.

The GM Supplier of the year award began us n global progrummo in 1992.

n-lobnl team of x cutiv, s from purchasing, engineering, manufacturing and gisti el ctf:. oward winners. Their decisions are based on supp]ier performance in quality, service, technology, cost etc.

TAPS relationship with GM (India) started with the supply of parts for or a and continues in a big way in supplies to the subsequent model Tavera. The relationship with GM global locations is underway with developments for Europe, Australia and North America.

GlVI and TACOtrAPS consider this relationship to be mutually beneficial and therefore it continues to grow stronger.

Tata Auto Plastic Systems awarded TKML award for 2004 *April 2005*

Toyota Kirloskar Motors Limited (TKML) has awarded TAPS with certificates for having met or exceeded their expectations of quality, cost and delivery targets for the year 2004.

The awards were presented in April 2005 at the annual supplier meet at Bangalore, India. TAPS-TKML relationship started with the supplies of parts for Corolla. TKML expressed further confidence in TAPS by awarding the supply of parts for their new model Innova.