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PLANNING FOR MODERN QUALITY SYSTEM

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Abstract: In quality planning it is always necessary to review existing programmers within the organization's functional areas, and these may be compared with the results of the preliminary analysis to appraise the strengths and weaknesses in quality throughout the business or operation. When this has been done, the required systems and programmers may be defined in terms of detailed operating plans, procedures and techniques.

Systematic planning is a basic requirement for effective quality management in all organizations. For quality planning to be useful, however, it must be pan of a continuous review process that has as its objective zero errors or defectives, through a strategy of never ending improvement. Before an appropriate total quality management system can be developed, it is necessary to carry out a preliminary analysis to ensure that a quality organization structure exists, that the resources required will be made available, and that the various assignments will be carried out.

A quality plan is a document which is specific to each product, activity or service (or group) that sets out the necessary quality-related activities. The plan should include references to any:

· Purchased material or service specifications. Quality system procedures:
· Product formulation or service type.
· Process control.
· Sampling and inspection procedures.
· Packaging or distribution specifications.
· Miscellaneous, relevant procedures.

Such a quality plan might form part of a detailed operating procedure.

For projects relating to new products or services, or to new processes, written quality plans should he prepared to define:

1. Specific allocation of responsibility and authority during the different stages of the project.
2. Specific procedures, methods and instructions to be applied throughout the project.
3. Appropriate inspection, testing, checking, or audit programmers required at various defined stages.
4. Methods of changes or modifications in the plan as the project proceeds.

Some of the main points in the planning of quality relate very much to the inputs of processes:

Plant/equipment - the design, layout and inspection of plant and equipment, including heating, lighting, storage, disposal of waste, etc.

Processes - the design and monitoring of processes to reduce to a minimum the possibility of malfunction and/or failure.

Workplace -the establishment and maintenance of suitable, clean and orderly places of work.

Facilities - the provision and maintenance of adequate facilities.

Procedures - the preparation of procedures for all operations. These may be in the form of general plans and guides rather than tremendous detail, but they should include specific operational duties and responsibilities.

Training - the provision of effective training in quality technology, process and plant operation.

Information - the lifeblood of all quality management systems. All processes should be accompanied by good data collection recording and analysis, followed by appropriate action.

Plan for a quality system

1. Establish a quality policy: a clear written quality policy should be issued by the chief executive.
2. Define TQM objectives: The objectives of the total quality management programmer should be set down in some detail
3. Define responsibilities: Quality must be the direct operational responsibility of the management. Appoint person as quality manager. Prepare line charts showing the areas of individual managerial responsibilities and lines of accountability. Prepare job descriptions.
4. Establish quality system: The requirements of the customer and of the organization must be met and the system, in terms of specific procedures, methods and instructions, clearly defined, widely disseminated, understood and operated by all.
5. Identify problem areas: Regular audits of the operations areas will lead to continual updating of potential problems.
6. Prepare quality improvement programmer: A programme should be designed to achieve established objectives. A project team may be set up.
7. Implement programe: Implementation requires the commitment and involvement of all employees.
8. Monitor progress: The quality improvement programme should be kept to the agreed time table.
9. Audit and review effectiveness: The practical implementation and appropriateness of the quality system should be continually compared with the objectives. A method for changes in the plan should be defined.

The quality plan should focus on providing action to prevent cash leaking away through waste. If the quality management system does not achieve this, then there is something wrong with the plan and the way it has been set up or operated - not with the principle. The whole approach should be methodical and systematic, and designed to function irrespective of changes in management or personnel.

1. **Flowcharting**

In the systematic planning or examination of any process, whether that be a clerical, manufacturing or managerial activity, it is necessary to record the series of events and activities, stages and decisions in a form that can be easily understood and communicated to all. If improvements are to be made, the facts relating to the existing method must be recorded first. The statements de lining the process should lead to its understanding and will provide the basis of any critical examination necessary for the development of improvements. It is essential therefore than the descriptions of processes, are accurate, clear and concise.

The usual method of recording facts is to write them down, but this is not suitable for recording the complicated processes that exist in any organization, particularly when an exact record is required of a long process and its written description would cover several pages requiring careful study to elicit every detail. To overcome this difficulty, certain methods of recording have been developed, and the most powerful of these is flowcharting. This method of describing a process owes much to computer programming, where the technique is used to arrange the sequence of steps required for the operation of the program. It has a much wider application, however, than computing.

Example of flowcharting in use - Improving a travel procedure

We start by describing the original process for a male employee, though clearly it applies equally to females.

The process starts with the employee explaining his travel plans to his secretary. The secretary then calls the travel agent to inquire about the possibilities and gives feedback to the employee. The employee decides if the travel arrangements, e.g. night numbers and dates, are acceptable and informs his secretary, who calls the agent to make the necessary bookings or examine alternatives. The administrative procedure, which starts as soon as the bookings have been made, is as follows:

1. The employee's secretary prepares the travel request (which is in four parts, A, B, e and D), and gives it to his secretary. The request is then sent to the employee's manager, who approves it. The manager's secretary sends it back to the employee's secretary.
2. The employee's secretary sends copies A. Band C to the agent and gives copy D to the employee. The travel agent delivers the ticket to the employee's secretary, together with copy B of the travel request. The secretary endorses copy B for receipt of the ticket, sends it to Accounting, and gives ticket to employee.
3. The travel agent bills the credit-card company and sends accounting a pro-forma invoice with copy C of the travel request. Accounting matches copies B and C and charges the employee's account.
4. Accounting receives the monthly bill from the credit-card company, matches it against the travel request, then books and pays the credit-card company.
5. The employee reports the travel request on his expense statement. Accounting matches and books to balance the employee's account.

The total time taken for the administrative procedure excluding the correction of errors and the preparation of overview reports is 23 minutes per travel request.

A quality-improvement team was set up to analyze the process and make recommendations for improvement, using brainstorming and questioning techniques. They made the following proposal to change the procedure. The preparation for the trip remained the same but the administrative steps, following the bookings being made became:

1. The travel agent sends the ticket to the secretary, along with a receipt document, which is returned to the agent with the secretary's signature.
2. The agent sends the receipt to the credit-card company, which bills the company on a monthly basis with a copy of all the receipts. Accounting pays the credit-card company and charges the employee's account.
3. The employee reports the travel on his expense statement and Accounting books to balance the employee's account.

The proposal reduced the total administrative effort per travel request (or per travel arrangement, because the travel request was eliminated) from 23 minutes to 5 minutes.

The details that appear on a flowchart for an existing process must be obtained from direct observation of the process, not by imagining what is done or what should be done. The latter may be useful, however, in the planning phase, or for outlining the stages in the introduction of a new concept. Similar charts may be used in the planning of quality management systems.

It is surprisingly difficult to draw flowcharts for even the simplest processes, particularly managerial ones and following the first attempt it is useful to ask whether:

- The facts have been correctly recorded.
- Any over-simplifying assumptions have been made.
- All the factors concerning the process have been recorded.

Summarizing, then, a flowchart is a picture of the steps used in performing a

function. This function can be anything from a process step to accounting procedures, even preparing a meal. Lines connect the steps to show the flow of the various functions. Flowcharts provide excellent documentation and are useful trouble-shooting tools to determine how each step is related to the others. By reviewing the flowchart, it is often possible to discover inconsistencies and determine potential sources of variation .and problems. For this reason, flowcharts are very useful in process improvement when examining an existing process to highlight the problem areas A group of people with the knowledge about the process, should take the following simple steps:

1. Draw a flowchart of existing process.
2. Draw a second chart of the now the process could or should follow.
3. Compare the two to highlight the changes necessary.

2. Planning for purchasing

Very few organizations are self-contained to the extent that their products and services are all generated at one location, from basic materials. Some materials or services are usually purchased from outside organizations, and the primary objective of purchasing is to obtain the correct equipment, materials and services in the right quantity, of the right quality, from the right origin, at the right time and cost. Purchasing also plays a vital role as the organization's 'window-on-the-world', providing information on any new products, processes, materials and services. It should also advise on probable prices, deliveries and performance of products under consideration by the research, design and development functions.

Although purchasing is clearly an important area of managerial activity, it is often neglected by both manufacturing and service industries. The separation of purchasing from selling has however been removed in many large retail organizations, which have recognized that the purchaser must be responsible for the whole 'product line' its selection quality specification delivery, price, acceptability and reliability. If any pan of this chain is wrong the purchasing function must resolve the problem. This concept is clearly very appropriate in retailing, where transformation activities on the product itself between purchase and sale are small or zero, but it shows the need to include market information in the buying decision processes in all organizations.

The purchasing system should be set OUI in a written manual which:

1. Assigns responsibilities for and within the purchasing function.
2. Defines the manner in which suppliers are selected, to ensure that they are continually capable of supplying the requirements in terms of material and services.
3. Indicates the purchasing documentation - written orders, specifications, etc. - required in any modern purchasing activity.

So what does an organization require from its suppliers? The goals are easy to state, but less easy to reach:

- Consistency - low variability.
- Centering - on target.
- Process evolution and development to continually reduce variability.
- Correct delivery performance.
- Speed of response.
- A *systematic* quality management approach to achieve the above.

Historically many organizations, particularly in the manufacturing industries, have operated an inspection-oriented quality system for bought-in pans and materials. Such an approach has many disadvantages. It is expensive, imprecise, and impossible to apply evenly across all material and pans, which all lead to variability in the degree of appraisal. Many organizations, such as Ford, have found that survival and future growth in both

volume and variety demand that changes be made to this approach.

The prohibitive cost of holding large stocks of components and raw materials also pushed forward the 'just-in-time' *(JIT)* concept. As this requires that suppliers make frequent, on time, deliveries of small quantities of material, parts, components, etc., often straight to the point of use, in order that stocks can be kept to a minimum, the approach requires an effective supplier network - one producing goods and services that can be trusted to conform to the real requirements with a high degree of confidence.

Commitment and involvement

The process of improving suppliers' performance is complex and clearly relies very heavily on securing real commitment from the senior management of the supplier organizations. This may be aided by presentations made to groups of directors of the suppliers brought together to share the realization of the importance of their organizations' performance in the quality chains. The synergy derived from different suppliers meeting together being educated and discussing mutual problems, will be tremendous. If this can be achieved within the constraints of business and technical confidentiality, it is always a better approach than separate meetings and presentations on the suppliers' premises.

The many benefits that accrued from bringing together suppliers of a photocopier paper and ring binders to explain to them the way their inputs were used to generate training-course materials and how they in turn were used during the courses themselves. The suppliers were able to understand the business in which their customers were engaged and play their part in the whole process. A supplier of *goods* or *services* that has received such attention, education and training, and understands the role its inputs play is less likely knowingly to offer nonconforming materials and services and more likely to alert customers to potential problems.

Policy

One of the first things to communicate to any external supplier is the purchasing organization's policy on quality of incoming goods and services. This can include such statements as:

- It is the policy of this company to ensure that the quality of all purchased materials and services meets its requirements.
- Suppliers who incorporate a quality management system into their operations will be selected. This system should be designed implemented and operated according to the International Standards Organization (ISO) 9000 series.
- Suppliers who incorporate statistical process control (SPC) methods into their operations will be selected.
- Routine inspection checking, measurement and testing of incoming goods and services will *not* be carried out by this company on receipt.
- Suppliers will be audited and their operating procedures systems and SPC methods will be reviewed periodically to ensure a never ending improvement approach.
- It is the policy of this company to pursue uniformity of supply, and to encourage supply to strive for continual reduction in variability. (This may well lead to the narrowing of specification ranges.)

Quality system assessment certification

Many customers examine their suppliers' quality management systems themselves, operating a second party assessment scheme. Inevitably this leads to high costs and duplication of activity, for both the customer and supplier. If a qualified, independent third party is used instead to carry out the assessment; attention may be focused by the customer on any special needs and in developing closer partnerships with suppliers. Visits and dialogue across the customer-supplier interface are a necessity for the true requirements to be met, and for future growth of the whole business chain. Visits should

be concentrated, however, on improving understanding and capability, rather than on close scrutiny of operating procedures, which is best left to experts, including those within the supplier organizations charged with carrying out internal system audits and reviews.

3. Planning for just-in-time (JIT) management

There are so many organizations throughout the world that are looking at introducing, or practicing just-in-time (JIT) management principles that the probability of encountering it is very high. JIT, like many modern management concepts, is credited to the Japanese, who developed and began to use it in the late 1950s. It took approximately 20 years for JIT methods to reach Western hard goods industries and a further 10 years before businesses realized the generality of the concepts.

Basically JIT is a programmer directed towards ensuring that the right quantities are purchased or produced at the right time, and that there is no waste. Anyone who perceives it purely as a material-control system, however, is bound to fail with JIT. JIT fits well under the TQM umbrella, for many of the ideas and techniques are very similar and, moreover, JIT will not work without TQM in operation. Writing down a definition of JIT for all types of organization is extremely difficult, because the range of products, services and organization structures leads to different impressions of the nature and scope of JIT. It is essentially:

- A series of operating concepts that allows systematic identification of operational problems.
- A series of technology-based tools for correcting problems following their identification.

The Kanban system

Kanban is a Japanese word meaning visible record, but in the West it is generally taken to mean a card that signals the need to deliver or produce more parts or components. In manufacturing, various types of record cards, e.g. job orders or tickets and route cards are used for ordering more parts in a *push* type, schedule-based system. In a push system a multi-period master production schedule of future demands is prepared, and a computer explodes this into detailed schedules for producing or purchasing the appropriate parts or materials. The schedules then *push* the production of the parts or components, out and onward. These systems, when computer-based, are usually called Material Requirements Planning (MRP) or the more recent Manufacturing Resource Planning (MRPII).

The main feature of the Kanban system is that it *pulls* parts and components through the production processes when they are needed. Each material, component, or part has its own special container designed to hold a precise, preferably small, quantity. The number of containers for each part is a carefully considered management decision. Only standard containers are used and they are always filled with the prescribed quantity.

A Kanban system provides parts when they are needed but without guesswork, and therefore without the excess inventory that results from bad guesses. The system will only work well however, within the context of a JIT system in general, and the reduction of set-up times and lot sizes in particular. A JIT programmer can succeed without a Kanban-based operation, but Kanbans will not function effectively independently of JIT.

Just-in-time purchasing

Purchasing is an important feature of JIT. The development of long-term relationships with a few suppliers, rather than short-term ones with many, leads to the concept of *co producers* in networks of trust providing dependable quality and delivery of goods and services. Each organization in the chain of supply is encouraged to extend JIT methods to its suppliers. The requirements of JIT mean that suppliers are usually located near the purchaser's premises, delivering small quantities, often several times per day, to match the usage rate. Paperwork is kept to a minimum and standard quantities in standard

containers are usual. The requirement for suppliers to be located near the buying organization, which places those at some distance at a competitive disadvantage, causes lead times to be shorter and deliveries to be more reliable.

It can be argued that JIT purchasing and delivery are suitable mainly for assembly line operations, and less so for certain process and service industries, but the reduction in the inventory and transport costs that it brings should encourage innovations to lead to its widespread adoption. Those committed to open competition and finding the lowest price will find most difficulty. Nevertheless, there must be recognition of the need to develop closer relationships and to begin the dialogue - the sharing of information and problems - that leads to the product or service of the right quality, being delivered in the right quantity, at the right time.

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