

PERT AND CPM

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Pert (Programme Evaluation and Review Technique) and CPM (Critical Path Method) are Important Network techniques useful in Planning and controlling. These techniques are especially useful for Planning, scheduling and implementing time-bound projects involving performance of a variety of complex, divers and interrelated activities. These Techniques deals with time scheduling and resource allocation for these activities and aims at effective execution of projects within given time schedule and structure of costs.

PERT

Programme Evaluation and Review techniques (PERT) is a one used for scheduling and controlling the projects. PERT is a time – event network analysis techniques designed to watch how the part of a programme fit together during the passage of time and events. The special project Office of the U.S Navy developed this techniques in 1957.It involves the application of network theory to scheduling problems. In PERT, we assume that the expected time of any operation can never be determined exactly.

FEATURES OF PERT

The following are the main feature of PERT,

- 1) All individual tasks should be shown in a network. Events are shown by circles. Each circle represents an event, a subsidiary plan whose completion can be measured at a given time.
- 2) Each arrow represents an activity, the time consuming element of programme, the effort that must be made between events.
- 3) Activity time is the elapsed time required to accomplish an events. In the original PERT, three time value are used as follows,
 - i) Optimistic Time (t_0):It is the best estimate of time if everything goes exceptionally well.
 - ii) Most likely Time (T_m):It is an estimated time what the project engineer believes necessary to do the job or it is the time which most often is required if the activity is repeated a number of times.

- iii) Pessimistic Time (T_p): It is an activity time under adverse conditions. It is the longest time and rather is more difficult to ascertain.
- iv) Expected Time: The experiences have shown that the best estimator of time out of several estimates made by the project engineer.

STEPS IN PERT

Steps to be followed for accomplishing a project planning in PERT –

- 1) Dividing systematically the project into various activities
- 2) Arranging activities in logical sequence.
- 3) Drawing network diagram and numbering events and activities
- 4) Using three time estimate, the expected time for each activity is calculated.
- 5) Computing standard deviation and variance for each activity.
- 6) Calculating earlier starting times and latest finishing times.
- 7) Marking expected time, earliest starting times and latest finishing times on network diagram.
- 8) Calculating slack
- 9) Identifying and marking critical path(s) on network diagram.

ADVANTAGES OF PERT

PERT is a very important of managerial planning and control at the top level concerned with the overall responsibility of a project. PERT has the following merits.

- PERT forces managers and subordinate managers to make a plan for production because time event analysis is quit impossible without planning and seeing how the pieces fit together.
- PERT encourage s management control by exception.
- It enables forward –working control as the delay will affect the succeeding events and possibles the whole projects. The production manager can somehow make up the time by shortening that of some other event.
- The network system with its sub – systems creates a pressure for action at the right spot and level and at the right time.
- PERT can be effectively used for rescheduling the activities.

LIMITATION OF PERT

The uses of PERT technique and are subject to the following limitation

- 1) It is a time – consuming and expensive technique.
- 2) It is based on beta distribution and the assumption of beta distribution may not always be

true.

- 3) PERT is not suitable when programme is nebulous and a reasonable estimate of time schedule is not possible.
- 4) It is not useful for routing planning of recurring events such as mass production because once a repetitive sequence is clearly worked out elaborate and continuing control is not required.
- 5) The expected time and the corresponding variance are only estimated values.

CRITICAL PATH METHOD (CPM) AND IDENTIFYING CRITICAL PATH

The critical path analysis is an important tool in production, planning and scheduling. This was developed in 1957 and is suitable for the construction of civil and mechanical projects and for scheduling plant maintenance computer systems etc. CPM technique is useful to determine how best to reduce the time required to perform routine production, maintenance, construction and minimize the direct and indirect expenses.

CPM is used for scheduling special projects where the relationship between the different parts of projects is more complicated than that of a simple chain of task to be completed one after the other. This method (CPM) can be used for both simple and the most complicated tasks. With the help of CPM, manager can know that which operation should be started after completing particular cooperation and what is the progress of the work as related to the schedule timings?. It also tells that at what movement and in what operations, time schedules are adhered to strictly so that, future programme is not affected and where it may be delayed and up to what extent without affecting the last date of completion of the project.

The network be prepared in the following phases.

- 1) Preparation of network
- 2) Estimation of expected time to perform each activity.
- 3) To compute the critical path schedule and
- 4) Interpretation of results.

According to John L.Burbidge, “One of the purposes of critical path analysis is to find the sequence of activities with the largest sum of duration times, and thus find the minimum time necessary to complete the project. This critical series of activities is known as the” Critical Path’. “It is called critical path because any delay in performing the activities on this path may cause delay in the whole project. So, such critical activities should be taken up first.

CPM marks critical activities in a project and concentrates on them. It is based on the assumption that the expected time is actually the time taken to complete the object.

ADVANTAGES OF CPM

The application of CPM leads to the following advantages

- It provides an analytical approach to the achievement of project objectives, which are defined clearly
- It identifies most critical elements and pays more attention to these activities.
- It assists avoiding waste of time, energy and money on unimportant activities.
- It provides a standard method for communicating project plane, schedules and cost.

Thus, CPM technique is a very useful analysis in production planning of a very large project.

