PROJECT MONITORINF AND CONTROL & EVALUATION

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Project Monitoring:

- Monitoring is the regular observation and recording of activities taking place in a project or programme. It is a process of routinely gathering information on all aspects of the project.
- To monitor is to check on how project activities are progressing. It is observation; — systematic and purposeful observation.
- Monitoring also involves giving feedback about the progress of the project to the donors, implementers and beneficiaries of the project.
- Reporting enables the gathered information to be used in making decisions for improving project performance.

Project control:

- Project control are the data gathering, management and analytical processes used to predict, understand and constructively influence the time and cost outcomes of a project or program; through the communication of information in formats that assist effective management and decision making.
- This definition encompasses all stages of a project or program's lifecycle from the initial estimating needed to 'size' a proposed project, throughto reflective learning (lessons learned) and the forensic analysis needed to understand the causes of failure (and develop claims).

Project control discipline can be seen as encompassing:

- Project strategy, undertaking planning and methods studies to help the PM optimise future outcomes
- Scheduling including development, updating and maintenance
- Cost estimation, cost engineering/control and value engineering
- Risk management, including maintaining the risk register and risk analysis/assessment
- Earned Value Management and Earned Schedule, including WBS, OBS and other breakdown structures
- Document control
- Forensic Assessment for required diagnosis of schedule and cost
- Supplier performance measurement / oversight (but excluding contract administration)

Purpose of project monitoring and control:

- Monitoring is very important in project planning and implementation.
- It is like watching where you are going while riding a bicycle; you can adjust as you go along and ensure that you are on the right track.
- Monitoring provides information that will be useful in:
- Analysing the situation in the community and its project;
- Determining whether the inputs in the project are well utilized;
- Identifying problems facing the community or project and finding solutions;
- Ensuring all activities are carried out properly by the right people and in time;
- Using lessons from one project experience on to another; and
- Determining whether the way the project was planned is the most appropriate way of solving the problem at hand.

Characteristics of project monitoring and control:

- The project manager or lead utilizes skills and tools to review progress, capture requested scope changes, risks, and document achievements. By monitoring and controlling the project, the PM or lead keeps the project moving and allows for any necessary adjustments.
- Regularly assessing progress related to scope, timeline, and budget helps to minimize the impact of setbacks as the project progresses. By capturing and assessing progress, proper evaluation of variance to plan can be conducted and corrective actions implemented. Additionally, as the PM or lead is thoroughly capturing progress and any missed activity dates, adjustments and trade-offs.

Monitoring & control by...

- Status reporting
- Conducting a project review with stakeholders
- Control schedule variances
- Controlling scope and change requests
- Controlling budget
- Tracking & mitigating risks

Planning for monitoring and evaluation:

- A monitoring and evaluation (M&E) plan describes how the whole monitoring and evaluation system for the program works.
- This includes the indicators, who is responsible for collecting them, what forms and tools will be used, and how the data will flow through the organization.

Importance of planning:

- Planning is a key stage in the monitoring and evaluation cycle. Organisations should think about:
  - Why do we want to do it and for whom?
  - What will we monitor and evaluate?
  - How will we do it?
  - Who will do it and do we have the right skills?
  - When will we do it?
  - What resources will we need, including outside support?
  - What will we do with the information we get?

- Organisations themselves, and their stakeholders, will usually want to find out how the organisation or project is meeting its planned aims and objectives. These need to be clearly stated in the early stages of planning.

Integrating monitoring and evaluation:

- Monitoring and evaluation systems should be developed when an organisation first starts up, so that collecting information becomes part of everyday life. Often there are later opportunities to expand, develop or focus monitoring or to carry out more developed evaluation:

  - When an organisation is changing or developing
  - If it is applying for or has received new funding
  - When information is needed for assessment against quality standards
  - When information is needed for strategic planning.

Developing a monitoring and evaluation plan:

- Drawing up a monitoring and evaluation plan will help the organisation to think about how it will carry out monitoring and evaluation over the year or over the lifetime of a project. It will consider:

- When will different information be collected?
- Who will carry out and manage the activities?
- How will information be collected, analysed and presented?
- How will monitoring and evaluation findings be used in short-term planning and decision making, and quality reviews?

Earned Value Analysis (EVA)

Earned Value Analysis

- EVA is a system for planning and controlling project cost performance.
- It establishes a work package earned value baseline by integrating project scope, time , schedule and cost objectives. This baseline is called control account is used for performance evaluation on a given date.
- Analysis of variance from baseline provides cost related information for problem identification, trend analysis and corrective action.

Earned Value Analysis

- Earned value analysis serve 2 main purposes-
- 1. To analyze the cost changes resulting in time and cost over-runs or under-runs for taking timely corrective actions such as modifying cash flow, and updating financial forecasts and project profitability expectations.
- 2.To update key personnel on anticipated cost changes in their field of responsibility, so as to create cost consciousness for exploring means of minimizing wastage and reducing costs.

Earned Value Analysis

- Consider a project with projected cost at completion of Rs 1,60,000 and completion period of 20 weeks. When reviewed at the end of 10th week, it shows that as against the planned cost of Rs 92000/- at the end of 10 the week provided all the work is done as planned; it has incurred expenditure of Rs 90,000.
- It raises many question such as how well is the project actually performing; is it nor performing well as actual expenses spent are less than budgeted, is the project behind the schedule work or could be that the work has been done nicely and project may be completed at a cost that is below budget.

Earned Value Analysis

- Analysis of variance from baseline using EVA yields variety of variances that are analyzed to determine the current status, initiate corrective actions and forecast the future trends.
- EVM is the process of measuring performance of project work against a baseline plan. The application of EVM enables better integration of cost and time schedule control with responsibility defined in OBS.
- It provides better overall picture of performance and gives better forecast of the final costs at completion.
- Thus EV represents a translation of project cost into work progress.

Earned Value Analysis

- **Planned Value(PV):** It is the cumulative planned value of the authorized work, scheduled for completion to date at contract rate. It represents time-phased cost projections of planned value in the budget. For example, if a project has budget of Rs 1,00,000 and 5 month schedule shows that 40 % of the value of project work should be completed at the end oof 5^{th} month, then PV at the end of 5^{th} month is Rs 4,00,000/-. The planned value is also called as Budgeted Cost of Work Scheduled(BCWS).

Earned Value Analysis

- **Earned Value (EV) :** It is the cumulative value of the authorized work completed to date at contract rate.
- For example, if a project has budget of Rs 1,00,000 and work completed to date represents 25 % of the value of entire project work as against the 40 % planned, then EV at the end of 5th month is Rs 2,50,000/-. The Earned value is also called as Budgeted Cost of Work Performed.(BCWP).

Earned Value Analysis

- **Actual Cost (AC) :** It is the cumulative actual expenses including apportioned management reserve incurred in the project to date..
- For example, if a project has budget of Rs 10,00,000 and Rs 5,00,000 has been spent on the project to date, the AC of the project would be Rs 5,00,000 . Actual Cost is also known as Actual Cost of Work Performed.(ACWP).

Earned Value Analysis

- If a project progresses exactly as per cost and time integrated plan, the 3parameters will be identical. But this rarely happens.
- The difference (EV-AC) and (EV-PV) during implementation phases generates variances.
- Cost Variance: Cost Variance is computed by comparing actual performance (AC) with the budgeted cost of work performed (EV).
- **Cost Variance(CV)= EV-AC.**
- =2,50,000-500000
- =-250000/-
- If CV is positive the project has under-run, i.e. the cost incurred is less than planned or budgeted cost.
- If CV is negative the project has over-run, i.e. the cost incurred is more than planned or budgeted cost.
- If CV is zero, then the project is proceeding according to the budgeted cost.

Earned Value Analysis

- **Schedule Variance(SV):** Schedule Variance is computed by comparing planned performance (PV) with the budgeted cost of work performed (EV).
- Schedule Variance(SV)= EV-PV.
- =250000-400000
- =-150000
- If SV is positive then the project is ahead of its planned cost or planned schedule, i.e. earned value of the work performed is higher than planned or scheduled earned value.
- If SV is negative, then the project is behind its planned cost or planned schedule, i.e. earned value of the work performed is less than planned or scheduled earned value.
- If SV is zero, then the project is proceeding according to the planned schedule.

Earned Value Analysis

- **Performance Indices:- It determines how efficiently the task was done and what its implications will be on future trends. The future trends in productivity, cost and time performance can be predicted as under**
- **Cost Performance Index(CPI)= EV/AC**
- =250000/500000
- =0.5
- **Schedule Performance Index(SPI)**=EV/PV
- =250000/400000
- =0.625
- An index of 1.0 or greater indicates a favorable performance and less than 1.0 implies an unfavorable trend.

Earned Value Analysis

- **Estimate at completion-** The project manager should prepare a to-complete forecast, which is an estimate of time and cost needed to complete the project.
- This forecast plus the current status of the project provide a forecast of the date and cost of the project at completion.
- **Estimated Cost to complete the project(ETC) =(BAC-EV)/CPI**
- Where BAC is the budgeted cost at completion for the project (the same as the total planned value as of the target completion date)
- ETC= (1000000-250000)/0.5
- = 1500000/-

Earned Value Analysis

- **EAC (Estimated cost at completion)=AC+ ETC**
- =500000+1500000
- =2000000

Earned Value Analysis

Shortcomings of the Earned Value Method

Earned value information must be treated cautiously because it is sometimes inaccurate and misleading. For example, a negative CV (overrun) can arise because of excessive overhead charges, which originate outside the project and have little bearing on its performance. Similarly, a positive CV (underrun) can occur simply because bills have yet to be aid. In general, whenever payments are made in periods other than when expenses are incurred or budgeted, the CV is skewed. This leads some companies to apply the method to some cost factors (e.g., labor-hours of their own employees, for which payroll expenses coincide closely with work performed) and not others (e.g., procured items requiring advance payment). In the end, individual cost sources should be scrutinized to identify the reasons for variances.

Problem from tutorial

2) Mr Arobindo Sanyal the Head of Procurement at AS Mechatronics Ltd. has budgeted to purchase 4 robotic devices @ Rs 100,000/- each during Week 19th Nov to 24th Nov 2012. In a review at the end of the week, it was seen that Mr.Sanyal has procured 3 Robots and spent Rs 4,50,000/-

a) Calculate the under mentioned values based on the above information.(5)
1) BCWS (PV): (Budgeted cost of work scheduled)
2) BCWP (EV): (Budgeted cost of work performed)
3) ACWP (AC): (Actual cost of work performed)
4) CV = (Cost variance)
5) CPI= (Cost performance index)
6) SV= (Schedule variance)
7) SPI= (Schedule performance index)
8) EAC= (Estimated cost at completion)
9) ETC= (Estimated cost to complete)

b) What are the interpretations of each of the above values with respect to the project?(5)

Solution

- 1.Planned Value(BCWS)= 4 robots x 100000
  = Rs 400000 /-
- 2.Earned Value (BCWP)=3 robots x 100000
  =Rs 300000/-
- 3.Actual Cost(ACWP) =3 robots x 150000
  =Rs 450000
- 4.Cost Variance(CV)= EV-AC
  = 300000-450000
  =-150000
- The project has overrun by Rs 150000 till date

Solution

- 5. Cost Performance Index (CPI)= EV/AC
  - =300000/450000
  - =2/3=0.667
- 6. Schedule Variance(SV)= EV-PV.
  - =300000-400000
  - =-100000
- The project is behind schedule by Rs 100000 work
- 7. Schedule Performance Index(SPI)=EV/PV
  - =300000/400000
  - =0.75
- The project is behind schedule by 25 % time.

Solution

- 8. Estimated Cost to complete the project(ETC) =(BAC-EV)/CPI
- =(400000-300000)/0.667
- =Rs 150000
- The project will require additional Rs 150000 to complete.
- 9. EAC (Estimated cost at completion)=AC+ ETC
- =450000+150000
- =Rs 600000
- The estimated project cost will be Rs 600000 as against the budgeted cost of Rs 400000 if it continues in the same way.

Thank You