

# Cost Control

Cost management – estimating, accounting

Project cash flow



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## Outline of the lecture

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- Management cost and control system (MCCS)
- Understanding control
- Budgets
- Variances



- Cost control is equally important to all companies, regardless of size.
  - Small companies generally have tighter monetary controls because the failure of even one project can put the company at risk, but they have less sophisticated control techniques.
  - Large companies may have the luxury to spread project losses over several projects, whereas the small company may have few projects.
  - Cost control is not only “monitoring” costs and recording data, but also analyzing the data in order to take corrective action before it is too late.
  - Cost control should be performed by all personnel who incur costs, not merely the project office.
  - Cost control is actually a subsystem of the management cost and control system (MCCS).
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Cost control implies good cost management, which must include:

- Cost estimating
  - Cost accounting
  - Project cash flow
  - Company cash flow
  - Direct labor costing
  - Overhead rate costing
  - Other tactics, such as incentives, penalties, and profit-sharing
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## Management cost and control system (MCCS)

- **Cost control is not only “monitoring” costs and recording data, but also analyzing the data in order to take corrective action before it is too late.**
- **Cost control should be performed by all personnel who incur costs, not merely the project office.**

- The MCCS is represented as a two-cycle process: a planning cycle and an operating cycle.
- The operating cycle is what is commonly referred to as the cost control system.
- Failure of a cost control system to accurately describe the true status of a project does not necessarily imply that the cost control system is at fault.



# Management cost and control system (MCCS)

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- Any cost control system is only as good as the original plan against which performance will be measured.
  - Therefore, the designing of a planning system must take into account the cost control system.
  - For this reason, it is common for the planning cycle to be referred to as planning and control, whereas the operating cycle is referred to as cost and control.
  - The planning and control system must help management project the status toward objective completion. Its purpose is to establish policies, procedures, and techniques that can be used in the day-to-day management and control of projects and programs
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# Management cost and control system (MCCS)

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## **MCCS provide information that:**

- Gives a picture of true work progress
  - Will relate cost and schedule performance
  - Identifies potential problems with respect to their sources
  - Provides information to project managers with a practical level of summarization
  - Demonstrates that the milestones are valid, timely, and auditable
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# Management cost and control system (MCCS)

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- The planning and control system, in addition to being a tool by which objectives can be defined (i.e., hierarchy of objectives and organization accountability), exists as a tool to develop planning, measure progress, and control change. As a tool for planning, the system must be able to:
    - Plan and schedule work
    - Identify those indicators that will be used for measurement
    - Establish direct labor budgets
    - Establish overhead budgets
    - Identify management reserve
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# Management cost and control system (MCCS)

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- The project budget that results from the planning cycle of the MCCS must be reasonable, attainable, and based on contractually negotiated costs and the statement of work.
  - The basis for the budget is either historical cost, best estimates, or industrial engineering standards.
  - The budget must identify planned manpower requirements, contract-allocated funds, and management reserve.
  - Establishing budgets requires that the planner fully understand the meaning of standards. There are two categories of standards.
  - Performance results standards are quantitative measurements and include such items as quality of work, quantity of work, cost of work, and time-to-complete. Process standards are qualitative, including personnel, functional, and physical factors relationships.
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# Management cost and control system (MCCS)

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As a tool for measuring progress and controlling change, the systems must be able to:

- Measure resources consumed
- Measure status and accomplishments
- Compare measurements to projections and standards
- Provide the basis for diagnosis and replanning

In using the MCCS, the following guidelines usually apply:

- The level of detail is specified by the project manager with approval by top management.
  - Centralized authority and control over each project are the responsibility of the project management division.
  - For large projects, the project manager may be supported by a project team for utilization of the MCCS.
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# Management cost and control system (MCCS)

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MCCS planning activities include:

- Contract receipt (if applicable)
  - Work authorization for project planning
  - Work breakdown structure
  - Subdivided work description
  - Schedules
  - Planning charts
  - Budgets
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# Management cost and control system (MCCS)

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Even with a fully developed planning and control system, there are numerous benefits and costs. The appropriate system must consider a cost-benefit analysis, and include such items as:

- **Project benefits**
    - Planning and control techniques facilitate:
      - Derivation of output specifications (project objectives)
      - Delineation of required activities (work)
      - Coordination and communication between organizational units
      - Determination of type, amount, and timing of necessary resources
      - Recognition of high-risk elements and assessment of uncertainties
      - Suggestions of alternative courses of action
      - Realization of effect of resource level changes on schedule and output performance
      - Measurement and reporting of genuine progress
      - Identification of potential problems
      - Basis for problem-solving, decision-making, and corrective action
      - Assurance of coupling between planning and control
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# Management cost and control system (MCCS)

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The appropriate system must consider a cost-benefit analysis, and include such items as:

- **Project cost**
    - Planning and control techniques require:
      - New forms (new systems) of information from additional sources and incremental processing (managerial time, computer expense, etc.)
      - Additional personnel or smaller span of control to free managerial time for planning and control tasks (increased overhead)
      - Training in use of techniques (time and materials)
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# Understanding control

- Effective management of a program during the operating cycle requires that a well organized cost and control system be:
  - designed,
  - developed,
  - and implemented so that immediate feedback can be obtained, whereby the up-to-date usage or resources can be compared to target objectives established during the planning cycle.





The requirements for an effective control system (for both cost and schedule/performance) should include:

- Thorough planning of the work to be performed to complete the project
  - Good estimating of time, labour, and costs
  - Clear communication of the scope of required tasks
  - A disciplined budget and authorization of expenditures
  - Timely accounting of physical progress and cost expenditures
  - Periodic reestimation of time and cost to complete remaining work
  - Frequent, periodic comparison of actual progress and expenditures to schedules and budgets, both at the time of comparison and at project completion
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## Understanding control

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- Management must compare the time, cost, and performance of the program to the budgeted time, cost, and performance, not independently but in an integrated manner.
  - Being within one's budget at the proper time serves no useful purpose if performance is only 75 percent.
  - Likewise, having a production line turn out exactly 200 items, as planned, loses its significance if a 50 percent cost overrun is incurred.
  - All three resource parameters (time, cost, and performance) must be analyzed as a group, or else we might “win the battle but lose the war.”
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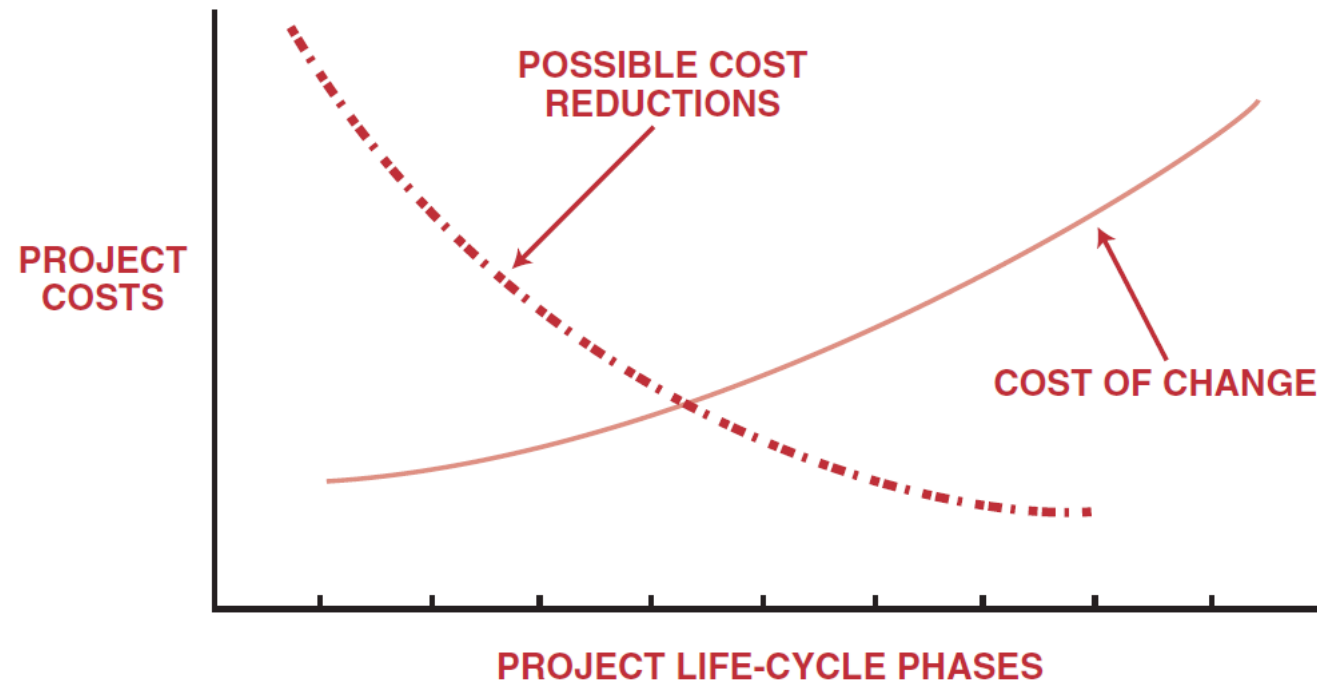




- The work breakdown structure therefore serves as the tool from which performance can be subdivided into objectives and subobjectives.
  - As work progresses, the WBS provides the framework on which costs, time, and schedule/performance can be compared against the budget for each level of the WBS.
  - The first purpose of control therefore becomes a verification process accomplished by the comparison of actual performance to date with the predetermined plans and standards set forth in the planning phase. The comparison serves to verify that:
    - The objectives have been successfully translated into performance standards.
    - The performance standards are, in fact, a reliable representation of program activities and events.
    - Meaningful budgets have been established such that actual versus planned comparisons can be made.
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- The comparison verifies that the correct standards were selected, and that they are properly used.
- Cost reductions are more available in the early project phases, but are reduced as we go further into the project life-cycle phases.

## Cost reduction analysis



Source: Kerzner, H. 2017. Project Management



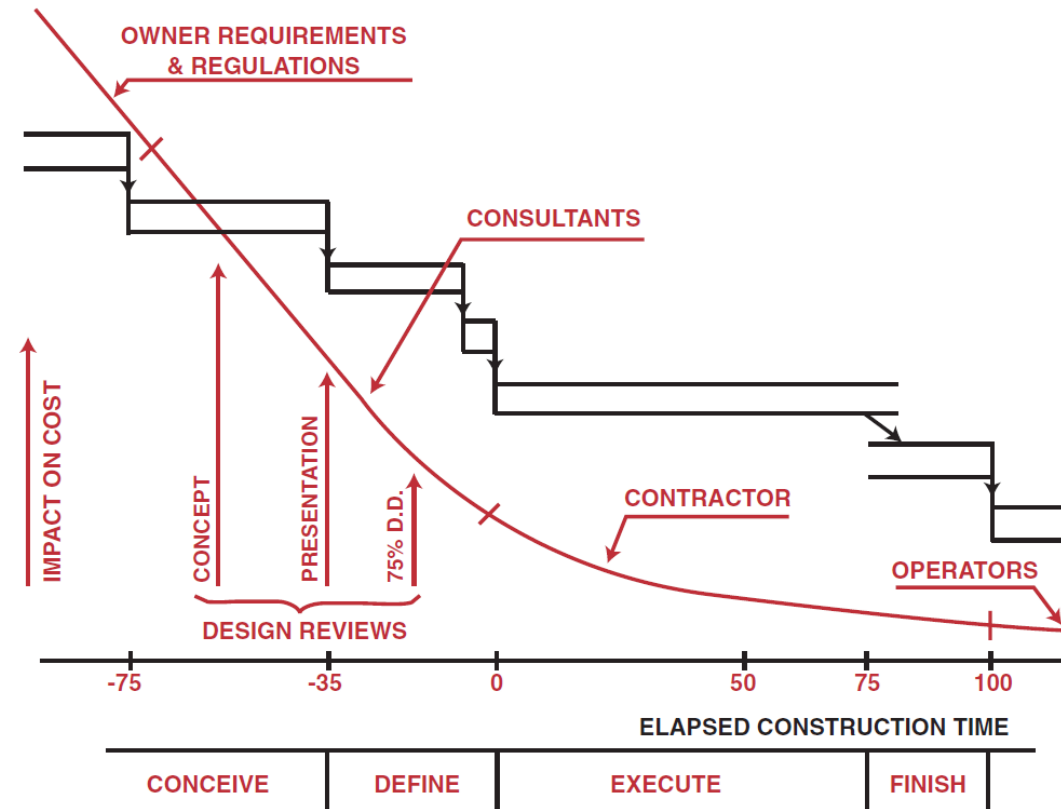
- The second purpose of control is decision-making. Three useful reports are required by management in order to make effective and timely decisions:
  - The project plan, schedule, and budget prepared during the planning phase
  - A detailed comparison between resources expended to date and those predetermined.
  - This includes an estimate of the work remaining and the impact on activity completion.
  - A projection of resources to be expended through program completion

These reports, supplied to the managers and the doers, provide three useful results:

- Feedback to management, the planners, and the doers
  - Identification of any major deviations from the current program plan, schedule or budget
  - The opportunity to initiate contingency planning early enough that cost, performance, and time requirements can undergo corrected action without loss of resources
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- Downstream the cost of changes could easily exceed the original cost of the project.
- This is an example of the “iceberg” syndrome, where problems become evident too late in the project to be solved easily, resulting in a very high cost to correct them.

## Ability to influence cost



Source: Kerzner, H. 2017. Project Management



Four categories of cost data are normally accumulated:

- Labor
  - Material
  - Other direct charges
  - Overhead
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- Project managers can maintain reasonable control over labour, material, and other direct charges.
  - Overhead costs, on the other hand, are calculated yearly or monthly and applied retroactively to all applicable programs. Management reserves are often used to counterbalance the effects of adverse changes in overhead rates.
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# Budgets

- The project budget, which is the final result of the planning cycle of the MCCS, must be reasonable, attainable, and based on contractually negotiated costs and the statement of work.
- The basis for the budget is either historical cost, best estimates, or industrial engineering standards.
- The budget must identify planned manpower requirements, contract allocated funds, and management reserve.



All budgets must be traceable through the budget “log,” which includes:

- Distributed budget
  - Management reserve
  - Undistributed budget
  - Contract changes
  - Management reserve is money amount established by the project office to budget for all categories of unforeseen problems and contingencies resulting in out-of-scope work to the performers.
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The budgeting and scheduling system variance must be compared because:

- The cost variance compares deviations only from the budget and does not provide a measure of comparison between work scheduled and work accomplished.
  - The scheduling variance provides a comparison between planned and actual performance but does not include costs.
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In order to calculate variances, we must define the three basic variances for budgeting and actual costs for work scheduled and performed. Archibald defines these variables:

- Budgeted cost for work scheduled (BCWS) is the budgeted amount of cost for work scheduled to be accomplished plus the amount or level of effort or apportioned effort scheduled to be accomplished in a given time period.
  - Budget cost for work performed (BCWP) is the budgeted amount of cost for completed work, plus budgeted for level of effort or apportioned effort activity completed within a given time period. This is sometimes referred to as “earned value.”
  - Actual cost for work performed (ACWP) is the amount reported as actually expended in completing the work accomplished within a given time period.
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When permitted variances are exceeded, cost account variance analysis reports are required. Required signatures may include:

- The functional employees responsible for the work
  - The functional managers responsible for the work
  - The cost accountant and/or the assistant project manager for cost control
  - The project manager, work breakdown structure element manager, or someone with signature authority from the project office
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- For variance analysis, the goal of the cost account manager (whether project officer or functional employee) is to take action that will correct the problem within the original budget or justify a new estimate.

Five questions must be addressed during variance analysis:

- *What is the problem causing the variance?*
  - *What is the impact on time, cost, and performance?*
  - *What is the impact on other efforts, if any?*
  - *What corrective action is planned or under way?*
  - *What are the expected results of the corrective action?*
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## Recording material costs using Earned Value Measurement

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- Using “earned value” measurement, the actual cost for work performed represents those direct and indirect costs identified specifically for the project (contract) at hand.
  - Both the recorded and reported costs must relate specifically to this effort. Recording direct labour costs usually presents no problem since lab or costs are normally recorded as the labour is accomplished.
  - Material costs, on the other hand, may be recorded at various times. Material costs can be recorded as commitments, expenditures, accruals, and applied costs. All provide useful information and are important for control purposes.
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# RECAP

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- **Approving all estimates, and negotiating all estimates and the definition of work requirements with the respective organizations.**
  - **Approving the budget, and directing distribution and budgeting of available funds to all organizational levels by program element.**
  - **Defining the work required and the schedule.**
  - **Authorizing work release. The manager may not, however, authorize work beyond the scope of the contract.**
  - **Approving the program bill-of-materials, detailed plans, and program schedules for need and compliance with program requirements.**
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- **Approving the procuring work statement, the schedules, the source selection, the negotiated price, and the type of contract on major procurement.**
  - **Monitoring the functional organization's performance against released budgets, schedules, and program requirements.**
  - **When cost performance is unacceptable, taking appropriate action with the affected organization to modify the work requirements or to stimulate corrective action within the functional organization so as to reduce cost without changing the contracted scope of work.**
  - **Being responsible for all communications and policy matters on contracted programs so that no communicative directives shall be issued without the signature or concurrence of the program manager.**
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