Series on general management functions and activities, and their relevance to the management of projects[1]

Article 6 of 7

Management Implementing/Controlling Functions and Activities

By Alan Stretton

BACKGROUND TO THIS SERIES

General management provides the foundation for building project management skills and is often essential for the project manager. On any given project, skill in any number of general management areas may be required. General management literature documents these skills, and their application is fundamentally the same on a project. (PMI 2004:15)

The importance of general management skills in the management of projects is widely acknowledged, as is reflected in the above quotation. Some aspects of general management are already quite well covered in the project management literature, but others not so well.

This series is primarily concerned with presenting a broad coverage of traditional/ classical materials on general management, which hopefully may fill in some of the gaps in current coverage in the project management literature. Its intention is to help project managers either directly, or by guiding them to relevant sources.

Another aim of this series is to look at various ways in which the functions and component activities of general management are relevant to the management of projects. I have tended to focus on materials that I have found to be most relevant and/or useful in over sixty years' experience in both forms of management.

The first article of the series (Stretton 2015g) presented a general management knowledge framework, summarised on the right. The second, third, fourth and fifth articles (Stretton 2015h, i, j, k) developed the classical/traditional functions of management planning, organizing, leading, and staffing.

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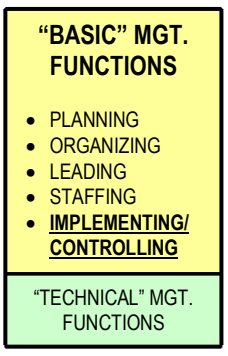
This sixth article is concerned with the function of management *implementing/controlling*, with the main focus on *controlling*, and its component activities.



[1] This series of articles on the relevance of general management activities and functions to project management is by Alan Stretton, PhD (Hon), Life Fellow of AIPM (Australia). Alan is a pioneer in the field of professional project management and one of the most widely recognized voices in the practice of program and project management. Long retired, Alan is still accepting some of the most challenging research and writing assignments; he is a frequent contributor to the ***PM World Journal***. See his author profile at end of this article.

MANAGEMENT IMPLEMENTING/CONTROLLING

IMPLEMENTING/ CONTROLLING

Establishing performance standards

Performance measuring

Performance evaluating

Performance correcting

Definitions and components of management controlling

Management Controlling: *the work a manager performs to assess and regulate work in progress and completed*
(Allen 1964:315)

Allen identified four primary components of controlling:

- *Establishing performance standards*: the work a manager performs to establish the criteria by which methods and results will be evaluated.
- *Performance measuring*: the work a manager performs to record and report work in progress and completed.
- *Performance evaluating*: the work a manager performs to appraise work in progress and results secured.
- *Performance correcting*: the work a manager performs to regulate and improve methods and results.

MANAGEMENT IMPLEMENTING/CONTROLLING OVERVIEW

Controlling is inexorably linked with planning

Planning and controlling are inexorably linked. Plans form the basis for control. We control against plans. As Koontz & O'Donnell 1978:58 said, "Planning and control are especially inseparable – the Siamese twins of management". Byrt & Masters (1982:57) said, "Neither planning or control by itself will enable objectives to be reached. Both are needed".

As will be discussed under Establishing Performance Standards, these standards come from plans. As Allen 1964:329 put it, "… sound plans provide the logical basis for meaningful standards".

Before going on to discuss the component activities of management controlling, we look at some more general aspects of the subject.

Types of control

In the general management context, Allen 1964:316 pointed out that there are two types of control – control by personal inspection, and control by exception. Allen also noted that both types of control are needed. Usually, managers at lower levels make greater use of control by inspection. Those at top levels rely to a greater extent on control by exception.

1. Control by personal inspection

In the project context, it would appear that, except for very large and/or dispersed projects, the project manager will normally be operating close to the "work face", and will therefore be in a position to make substantial use of control by personal inspection. A NASA writer, Chapman 1972 observed that

> The literature of project management tends to place relatively heavy emphasis on the formal systems of control and review. Although these systems contribute to the effectiveness of project management, they are too frequently mistaken for the key attributes of project management.

Later, he said that most NASA project managers make only limited use of the formal control and information systems. Principal reliance was placed upon informal, unwritten, face-to-face or telephone discourse.

On Civil & Civic building construction projects, control by personal inspection usually exceeded the project managers' use of the more formal control systems.

2. Control by exception

This type of control involves focusing attention only on those items that deviate significantly from planned performance.

In this domain we have what is sometimes called the 80-20 rule, which roughly translates into the statement that 20% of occurrences cause 80% of the results. Allen 1964:318 called this his Principle of Least Cause: "In any number of occurrences, a small number of causes will tend to give rise to the largest proportion of results".

Drucker 1977:405 expressed similar thoughts thus:

> Control is a principle of economy….. The first question a manager …. needs to ask in designing or using a system of controls is "What is the minimum information I need to know to have control?"

In the project context, control by exception in Civil & Civic took the form of highlighting variances (differences between actual and planned results) that deviated more than a certain percentage from the planned results.

Controls and value systems

Kast & Rosenzweig 1981:451 connected controls and values thus:

> The development of reasonably congruent value systems, at least with regard to pertinent organisational issues, is an important means of control. If all key organisational decision makers "think alike", the managerial system is very likely "in control".

In the project context, I think this was a very important attribute that prevailed in Civil & Civic and on its projects. Even those who were not naturally control-oriented respected the fact that it was to everyone's benefit to use the prescribed and recommended control systems as effectively as they could. This was very much part of the value system.

Controls and the quality of managers

Koontz & O'Donnell 1978:466 made the very relevant point that "the most direct form of control is assurance of the quality of managers". They even enshrined this in a Principle of Direct Control: "The higher the quality of managers and subordinates, the less will be the need for indirect controls" (p.524).

This rather obvious, but often overlooked point, was also alluded to by Drucker 1977:411: "…. people decisions are the ultimate control of an organization".

In the project context, we were always acutely aware of this in Civil & Civic. There is no substitute for high quality project managers and their staff.

Time pressures and controls

Another point relevant to these general discussions on management control is that, in conventional enterprises, there is generally considerable time and opportunity to collect and analyse information, and to reapply lessons learnt.

In the project context, this is seldom the case. As Bradnam 1976 said,

> In project situations, where the manager and his team are faced with continual change, the value of historic reporting is severely limited,[The project manager] does not have the advantage of the 'learning curve' which is fundamental to, say, a production organization.

Chapman 1972 pointed out that one of the reasons why NASA project managers did not rely on the formal information and control systems to keep informed, or to make critical decisions, is that, being a written system, it is rarely up to date, and therefore has limited value as an alerting system, especially on technical problems.

As will be discussed under Performance Measuring, forecasting final variances is better suited to fast-moving projects.

Imposed control verses self-control

Kast & Rosenzweig 1981:454 said the following about the prevalence of imposed control:

> A prevalent traditional view is that control is a function of the formal structure and authority (right to command) relationship.

Interestingly, for so traditional a source, Allen specifically advocated self-control. Although he does not mention it specifically in Allen 1964, his original Profession of Management Program incorporated a Principle of Self-Control: "Self-control tends to be the best control" (Allen 1962:C-2). This is supported – at least in part – by his Principle of Point of Control: "

> The greatest potential for control tends to exist at the point where the action takes place. (Allen 1964:319)

Kast & Rosenzweig 1981:457 equated self-control with the Theory Y beliefs typical of the open/adaptive/organic organizational form, thus:

> If we are basically optimistic concerning our subordinates' ability, we are likely to delegate more, live with loose controls, and rely on people to control their own work activities and behaviour.

In the project context, since the project manager will normally be operating at, or close to the work face, and also since the organisational environment of the project is normally of the open/adaptive/organic type, self-control will normally be the most appropriate form of control.

Although we had very detailed project control procedures in Civil & Civic, their major purpose was to help project managers control their own projects.

Change control

Change control does not appear to be a typically difficult issue in the general management environment.

In the project context, however, change control is of primary importance. It is absolutely vital that projects have effective change control systems covering potential and actual changes to project scope, time, cost and quality objectives.

In normal circumstances, change of project scope tends to be the most difficult to control effectively. On most projects it is likely that one or more of the project's stakeholders will request changes to the product scope at some point, and that some of these scope change requests will be approved, and implemented. The task of controlling such changes is usually a demanding one, and a clear detailed change control system is essential.

Changes to project time, cost and quality objectives are generally easier to handle, than scope changes - but only if you have a comprehensive control system in place, which, from my experience, is easier said than done.

To give a very general indication of our approach in Civil & Civic, we used a "variation advice" as the initiating change document. Essentially, this was an advice of receipt of instructions to vary something. There were four broad categories:

- no change in costs
- change of price agreed with client on the spot
- variation instruction by client, with price not agreed immediately, and work not to start until price is agreed
- variation instruction by client, with price not agreed immediately, but work to proceed before price is agreed (prompts a provisional variation advice)

From this point on we used "confirmations of variation advices" and "change notices" as documents that confirmed variation advices, and sanctioned their implementation.

The components of management control

There is substantial consensus in the general management literature about Allen's four primary components of management controlling, although somewhat different descriptors are often used. Mukhi et al 1988:475 added a fifth component, "feedback results", between performance measuring and performance evaluating, but perhaps this reflects more of a control-at-a-distance approach than some would feel comfortable with, particularly in the project context.

A circular representation of these components of management controlling is often used, along the following lines.

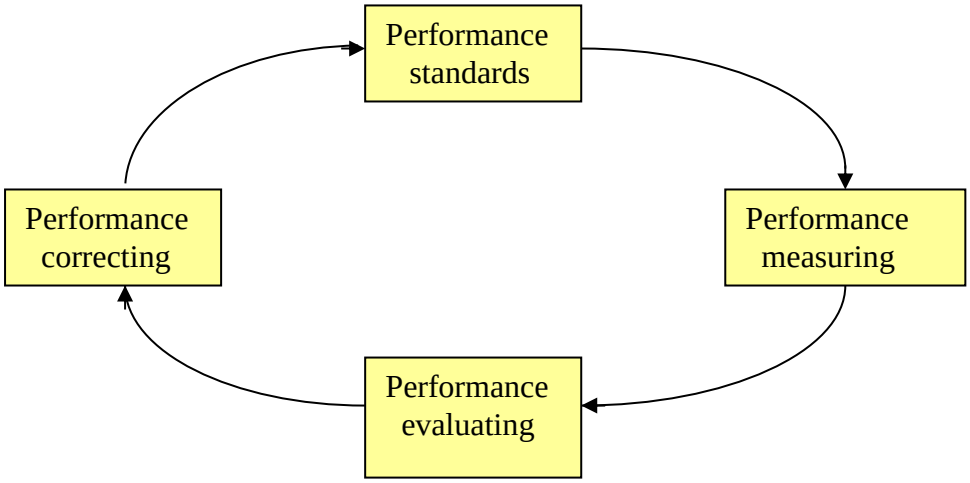


Figure 6-1: The components of management controlling

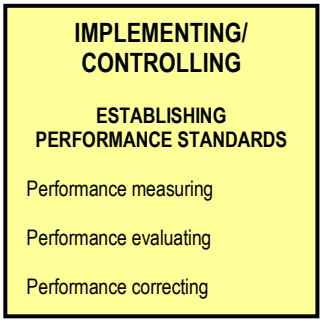
The reason for this circular depiction is that performance correcting often entails some replanning, which changes some parts of the performance standards, which then has flow-on effects on the remainder of the control cycle.

In the project context, these components of management controlling, and the circular control cycle, are wholly appropriate for, and are habitually used.

We now go on to discuss each of the above components of management controlling in turn.

ESTABLISHING PERFORMANCE STANDARDS

Establishing Performance Standards: *The work a manager performs to establish the criteria by which methods and results will be evaluated* (*Allen* 1964:325)



Performance standards are developed from plans

This is really the key issue with controlling. If the performance standards are not developed from plans, what are they developed from? There can be only one answer.

In the project context, performance standards are developed from project plans. As discussed in the second article of this series (Stretton 2015h), there is an *operational* relationship between general management and project management in the context of management planning. This starts when general management formulates strategic objectives for the organization. The best strategic option(s) to achieve these objectives are then developed and chosen. This is followed by the development of a balanced strategic portfolio of projects.

This strategic portfolio then initiates various projects. Each individual projects is defined, and project planning undertaken as a progressive elaboration from the project definition. These project plans then form the bases against which project control standards are developed.

This chain of operations then represents an operational linkage between project control, project plans, and general management's organizational strategic plans.

Project performance standards

The principal project objectives established in the planning process are generally scope, time, cost, quality, and client/stakeholder satisfaction.

Scope: The project scope objective is defined by the Scope Statement. The main task in controlling scope is controlling actual and potential changes to the scope. As discussed above under "Change control", this requires a comprehensive scope change control system, coupled with time, cost and quality change control systems.

Time: Time plans comprise the programs, schedules and budgeted resources developed and progressively elaborated for each phase of the project life cycle. Performance standards for the control of each phase are derived from these plans. Decisions may be required about how much "stretch" to build into time standards.

For example, in Civil & Civic we would often establish target project durations that were significantly less than the original project time objectives, particularly if the project was of a routine type, and the project manager agreed.

Cost: Cost plans derive from the budgeted resources usage, expressed in dollar terms. One of the key cost control exercises in project management is to ensure that the progressive elaboration of requirements during the project life cycle does not result in increases in the original agreed total project cost, particularly during the development phase. As with project durations, we often built some "stretch" into the cost standards, particularly with certain types of projects, and the project manager's agreement to lower cost targets.

Quality: How project quality control is undertaken will depend to some extent on the degree to which the parent company has embraced Total Quality Management (TQM). If TQM is strong, the performance standards for quality will be multi-faceted. If it is weak or non-existent, performance standards for quality will tend to focus on product quality.

Client/stakeholder satisfaction: Basically, the customer perceives service and satisfaction in his own terms. It will be necessary to find out what those terms are if meaningful performance standards are to be established for client/stakeholder satisfaction during the currency of the project.

Involving people in planning and establishing performance standards

As Allen 1964:331 said,

> To be acceptable, standards must be developed with full consultation and participation of the people whose work will be measured.

In the project context, on Civil & Civic projects, progressive elaboration of the plans, and setting of detailed performance standards, were typically done by the project team, sometimes with the help of specialists.

PERFORMANCE MEASURING

Performance Measuring: *The work a manager performs to record and report work in progress and completed.*
(*Allen 1964*:332)

IMPLEMENTING/ CONTROLLING

Establishing performance standards

PERFORMANCE MEASURING

Performance evaluating

Performance correcting

Progress reporting

Allen focused heavily on the reporting aspects of performance measuring, which is no doubt appropriate to a functional/bureaucratic environment.

In the project context, it would seem to be also appropriate for very large projects. However, the main challenge with projects is to measure how much work has been done, and remains to be done, with reasonable accuracy, without needing an army of people to do this. There have been countless project control disasters from what has amounted to "guessing" percentage completion, rather than basing this on actual measurements. I call this the percentage complete problem, which is now discussed.

The "percentage complete" problem

In the project context, one of the more spectacular failures involving the "percentage complete" problem comes from ship-building projects, as reported by Baker et al 1976:

> An area with which the writer was most familiar entailed the use of percentage complete reports for reporting progress on U.S. ship construction to the U.S. Navy. If ever a tool was designed to lead management down the primrose path, the percentage complete report must come close to receiving the top award in that category. The writer found in some four shipyards that when ships were reported as 85% complete they were only about 70% complete, on average. When they were reported as 95% complete, they were only about 82% complete, on average. In one case, a ship was reported as 99.99% complete for over a year!

We had just this sort of problem in Civil & Civic on a complex building in Melbourne in the early 1960s. When we realised what had happened (a bit late in this case, I must admit), we upgraded our project control procedures very substantially.

To overcome this problem, we insisted that work items be broken down into units whose durations were not greater than the formal control review periods (normally a month, in our case). Thus, at each review period, most of the time/cost items will either have been completed, or not yet started. Even if the assessment of the state of completion of the relatively small amount of work in progress at the end of the period is not totally accurate, it is not going to affect the overall assessment of work completed to a significant extent.

A recommendation on commitment costing

In the project context, another device we used in Civil & Civic in performance measuring was what we called commitment costing. As soon as we placed an order for products or services, this was recorded in our cost control system as a committed cost, as if the money had already been spent. Initially, it took quite a lot of persuasion (to put it mildly) to get our accounting people to go along with commitment costing, but it was highly effective in practice.

Feedback and feed-forward - forecasting final positions

On the reporting side, Koontz & O'Donnell 1978:472 noted that conventional feedback is essentially historical, and that

> One of the difficulties with such historical data is that they tell business managers in November that they lost money in October (or even September) because of something that was done in July. At this late time, such information is only a distressingly interesting historical fact.

They went on to say,

> What managers need for effective management control is a system of control that will tell them, in time to take corrective action, that problems will occur if they do not do something about them now. This kind of feedback is not much more than a post-mortem, and no one has found a way to change the past.

Koontz & O'Donnell introduced the subject of "feed forward control" by saying that

> The time lag in the management control process demonstrates the need for future-directed control if control is to be effective.

They go on to say (p. 473)

> One common way many managers have practiced it [feed forward control] is through careful and repeated forecasts using the latest available information, comparing what is desired with the forecasts, and taking action to introduce program changes so that forecasts can be made more promising.

In the project context, in 1962 Civil & Civic developed a forecasting system as part of its control procedures. This focused on forecast final costs and variances, rather than current costs and variances, as the primary cost control tool. The main advantage of this approach was that the project manager had to analyse current costs and variances, and forecast the final position. For experienced project managers, this helped quantify what they were already aware of, and had instituted or confirmed appropriate action. In the case of less experienced project managers, it helped them focus on emerging problems or opportunities, and to take appropriate action.

So, the central idea of this forecasting system was that the measuring, evaluating and correcting control actions were taken by the accountable person, the project manager. This was control by self-control. Naturally, the system worked equally well for those to whom our project managers reported.

PERFORMANCE EVALUATING

Performance Evaluating: *The work a manager performs to appraise work in progress and results secured. (Allen 1964:339)*

IMPLEMENTING/ CONTROLLING

Establishing performance standards

Performance measuring

PERFORMANCE EVALUATING

Performance correcting

Control by self-control

Allen supports the concept of control by self-control. He says:

> The accountable manager is generally in the best position to evaluate his own performance and to take corrective action as the activity progresses.

But he also points out that self-control is not enough. He advocates effective checks and balances following two steps:

(1) Assurances that the accountable manager has been fully informed and given the opportunity to take corrective action; and

(2) Further reporting of the variance, if it is still significant, to a higher level of management ….

In the project context, control by self-control has already been acknowledged, and endorsed, as being fundamentally important to project control.

Using forecast final variances

In the project context, as already noted under Performance Measuring above, forecast final variances are recommended as more useful indicators than current variances for control in the rapidly moving project environment.

There are three types of evaluation, which are interdependent – progress, productivity and resources.

- Progress evaluation: This is an evaluation of actual progress against the time plan. Which operations are significantly behind or ahead of schedule? What are the forecast final variances for these operations? Why are they occurring? Progress variances may be due to productivity variances, or to resources variances. Or they may be due to other cause, such as poor time estimates.
- Productivity evaluation: This is an evaluation of actual performance against the cost plan. Which operations are significantly different from their estimated costs, either currently, or in terms of forecast final costs? Why? Variances may be due to productivity alone, but might also reflect sub-standard estimating.
- Resources evaluation: Both progress and productivity variances may reflect resource problems. All resources should be in balance, and at a quantitative level that will maintain planned progress.

Earned value measurement

This method originated in US Defence projects in the mid-1960s, under the name of Cost/Scheduling Control System Criteria (C/SCSC). The earned value method is a combined evaluation of progress and costs. It relates three variables:

1) the operations planned to date, and their estimated value (“Planned Value”)
2) the operations actually done to date, and their estimated value (“Earned Value”)
3) the Actual Costs of the operations done to date

Earned Value – Planned Value = Schedule variance
Earned Value – Actual Costs = Cost variance

It is quite a complex set of calculations in practice. We did not use it in Civil & Civic, having found that our own methods, which had already been developed and implemented, worked very well for us.

Focus of control – negative or positive variances

One matter of actual practice that has drawn frequent comment is the practically universal tendency to focus control effort on negative variances, in spite of the intellectual recognition that equal effort applied to maximise positive variances might by more productive. As Drucker 1977:420 expressed it:

> Businesses typically look upon the budget as an early warning system for danger and lack of performance, and this is an important function. But performance against budget should also be seen as an early warning system for opportunities, that is, for performance that is better than expected.

Byrt & Masters (1982:58) said much the same thing.

> It is interesting to reflect on the fact that the bulk of the literature on management control assumes that all variations from target will be in the negative or undesirable sense. The concept of using control to grasp opportunities is significantly absent.

In the project context of Civil & Civic, I have to confess that, although we were well aware of the above, negative variances still received a lot more managerial attention than positive variances

PERFORMANCE CORRECTING

Performance Correcting: *The work a manager performs to regulate and improve methods and results. (Allen 1964:343)*

IMPLEMENTING/ CONTROLLING

Establishing performance standards

Performance measuring

Performance evaluating

PERFORMANCE CORRECTING

Operating action and management action

Allen identified two types of corrective action – operating action and management action.

- ***Operating action*** is a short-term, emergency type of corrective action that is necessary when variances occur in the routine operation ("fire fighting")

- ***Management action*** is the development of new improved plans, organization, or controls, usually longer-term in nature ("fire prevention")

Allen 1964:345 linked the two as follows:

> If we want operating action to be truly effective, we should back it up with whatever management action is necessary.

In the project context, much the same should apply. However, time constraints on projects put limits on the amount of management action that is feasible or practical.

Focus on opportunity - replanning

Allen 1964 tended to focus on the negative – "Identifying what is wrong …" (p.343). However, as indicated in the section on Performance Evaluation, corrective action can be, and arguably should be, opportunity focused.

In the project context, replanning on the basis of lessons learnt in the evaluation is probably the most common aid to management action. This can (and should) be used both to minimise problems and to maximise opportunities.

Replanning may involve the following types of modifications:

- Performance Rates: Replanning should use performance rates which reflect the realities of achieved rates and trends to date. Replanned rates should be targeted to better previous achievement, but should be achievable.
- Resources: Evaluation of progress variances often results in decisions to modify the strength of resources.
- Method and sequence: Sometimes more substantial changes to method and sequencing may be necessary to minimise very substantial negative variances, or to maximise already substantial positive variances.

SUMMARY OF MANAGEMENT IMPLEMENTING / CONTROLLING

We began with quite an extensive overview of management controlling, which included types of control (by personal inspection, and by exception), the importance of appropriate value systems, having competent managers for effective control, imposed control and self-control, and change control. In all cases, materials from the general management literature were found relevant for project control. Some elements that are particular to the project context were expanded on.

IMPLEMENTING/ CONTROLLING

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Moving on to establishing performance standards, it was first established that these are developed from project plans. These, in turn, derive from general management's organizational strategic plans (Stretton 2015h). This then establishes an operational link between general management and project controlling. There were brief discussions specifically on project performance standards.

In performance measuring the main emphasis was on project-specific topics, particularly the "percentage complete" problem, and recommendations about commitment costing, and forecasting final positions. The latter was also further discussed in the next section on performance evaluating, which again was mainly concerned with evaluating in the project context. Finally, in performance correcting we were concerned with operating action and management action, and re-planning. As was the case in the overview, materials from the general management literature were found relevant for all four activities of project controlling.

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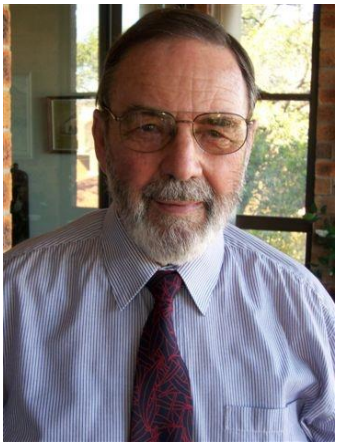
About the Author



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