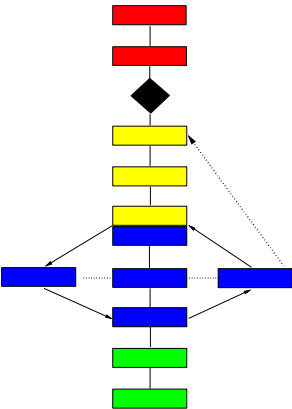


Progress Tracking Guide

MITP
v5.1



Edition Notice

First Edition (September 1995)

This edition applies to Version C5.0 of Managing the Implementation of the Total Project (MITP), and to all subsequent releases and modifications until otherwise indicated in new editions.

A form for reader's comments appears at the back of this document. If the form has been removed, address your comments to:

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PREFACE About This Document

This document describes how to use the MITP Progress Tracking technique to track and report on the progress of a project. It includes many valuable hints and tips supplied by experienced practitioners and is worth reading carefully. It is all too easy to overlook some of the common pitfalls associated with the apparently simple task of recording information on project progress. Following the introduction in topic 1.0, the document is divided into three topics:

- "Tracking Resource Utilization" in topic 2.0
- "How Do You Track Progress?" in topic 3.0
- "Progress Tracking Checklist" in topic 4.0.

For information about the MITP life cycle, the key techniques and the support techniques, see the MITP Handbook. A glossary of terms can be found at the back of the MITP Handbook.

Who Should Read This Document

The 'you' in this document is the Project Manager, but other people can read it too and extract useful information from it.

How to Use This Document

The table of contents provides a clear roadmap to the main topics outlined in this document.

ISO9000 Control Information

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1 Introduction to Progress Tracking

This topic provides an overview of the Progress Tracking technique.

Note: The Procedures for Techniques are contained in the Project Control Book Guide.

Progress tracking is required to assure you that the project is proceeding to plan. You record project information: how much time the members of your team spend on specified activities, how you spend your money, resources used, deliverables produced, and so on. This information is presented in the form of reports that can be circulated and discussed at appropriate reviews. See the Progress Reviewing Guide. The visibility of lack of progress is important in order that you can take prompt action to rectify out-of-line situations and bring the project progress back to the plan.

The process of progress tracking should be performed by the Project Office, or, if there is not a Project Office, by designated resources in the project team.

The purpose of progress tracking is:

- To provide information to show actual achievement versus plan for review and reporting purposes.
- To provide information to enable you to identify potential problem areas as early as possible.
- To provide a basis for you to take corrective action in order to adhere to the project plans.
- To maintain the appropriate level of commitment of the Project Sponsor and project team.

The characteristics of your reporting system should be:

- Measurement of the progress of each subproject against the plans (subproject, resource, quality, and so on).
- Variations from plans highlighted, revised forecasts to completion produced and corrective actions suggested.
- Summaries of progress and variations should be reported to the Project Sponsor.
- Formal reports should provide the input to project reviews (see the Progress Reviewing Guide).
- Informal reporting should supplement regular reviews to ensure that management are alerted to problems as soon as possible.
- Accuracy of estimates should be monitored to improve future plans.

Subtopics

- 1.1 MITP Standards for Progress Tracking
- 1.2 When Do You Track Progress?

1.1 MITP Standards for Progress Tracking

The MITP objective for progress management relating to progress tracking is to compare actuals with plans in order to take corrective action.

The following items are required as a minimum to achieve the above:

- A progress tracking cycle that quantifies and qualifies achievement versus plans.
- An effective communications system between you, the team members, the Project Sponsor, and other management associated with the project.
- Communication systems should cover formal and informal reporting and review processes.

1.2 When Do You Track Progress?

Tracking progress can be looked at in terms of the four phases of the MITP life cycle:

Identifying The Project

Not applicable unless you are running Project Tracking as a project in its own right.

Establishing the Project

- During this phase, the tracking activities are:
- Tracking the progress of Project Office set up (if applicable)
- Tracking the progress of building the detailed plan
- Establishing the project tracking procedures
- Establishing the project tracking forms
- Building the procedures and forms into the PCB
- Collecting and analysing the first set of tracking information
- Establishing report formats.

Managing the Project

During this phase, the tracking activities are:

- Collection of progress information required for project reviews
- Analysis of the information, identifying the out-of-line situations
- Completion of appropriate progress management reports
- Raising progress management or planning issues, as required

Ending the Project

- During this phase, the tracking activities are:
- Completion of the gathering and analysis of the tracking information
- Comparison of estimates, plan and actual performance
- Formulation of completion reports, which should be filed for use by later projects
- Consideration of amendments of any estimating bases in the light of this project's completion.

2 Tracking Resource Utilization

As a Project Manager, you will be aware of the three potentially conflicting measurements that may be applied to a project: time, cost, and quality. This topic discusses the need for a resource plan and for tracking time and money against this plan. For information on the quality aspects of progress tracking, see the Quality Management Guide.

Subtopics

- 2.1 The Resource Plan
- 2.2 What Should You Track?
- 2.3 Time Recording
- 2.4 Financial Tracking

2.1 The Resource Plan

All projects should have a resource plan built following the Project Definition Workshop and subproject definition sessions. This will indicate the numbers of people and at what times in the project they are required. Proper resource control is then the methodology that allows the actual resourcing to be assessed against the plan and action to be taken as appropriate where deviations occur. This leads to proper financial control of this part of the Budget Plan.

The most common form of resource plan lists the activity or tasks as a Gantt chart with people or groups assigned to each bar, as shown in Figure 1.

Activity	Who	Hrs	wk 1	wk 2	wk 3	wk4	wk 5	wk 6	wk 7
task1	A	n1	xxx	xxx					
task 2	B	n2		xxx	xxx	xxx			
task 3	C	n3				xx			
task 4	D	n4					xx		
task 5	E	n5					xx	xx	
task 6	F	n6							xx
Total			xx	xx	xx	xx	xx	xx	xx

Figure 1 Gantt chart

To be complete, however, totals need to be made for a predefined accounting period. This is usually a week or a month. From this a resourcing chart can be drawn, either on an accounting period basis or on an accumulated basis, as shown in Figure 2 and Figure 3.

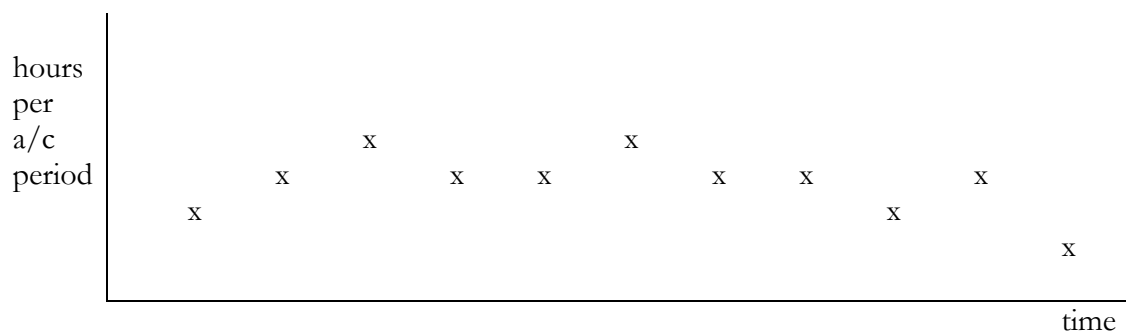


Figure 2 Resourcing Chart - Accounting Period

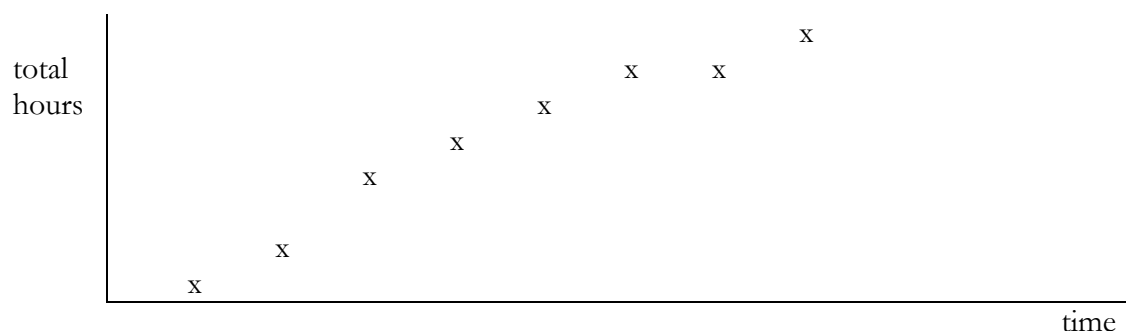




Figure 3 Resourcing Chart - Cumulative

From the resource plan, an indication of how time is to be used can be shown.

2.2 What Should You Track?

Different project types will require different things to be put into a plan and tracked; for example:

- Development Project
Plan people's time and track from timesheet information. Plan deliverables being built and track completions.
- Roll-out Project
Plan roll-out schedule and track actual numbers against plan.
- Implementation Project
Define what will be implemented when and track actual dates.
- Services Project
Plan resources to support service and track against actual.

It is important for you to identify, for your particular project, what it is critical to measure and track and to ensure that the tracking process adequately performs this. The term tracking indicators is used to mean whatever key items have been identified to define and measure progress. Typically, your tracking indicators might be:

- Budget spent (staff/suppliers or capital)
- Timesheet data (hours/days by task/activity/subproject)
- Deliverables (built, tested, accepted or released)
- Achievement (milestones, tasks completed)

Choosing the tracking indicators is part of the MITP Planning and Estimating technique (see the Planning and Estimating Guide) and should be done as part of the Project Startup activity. In addition, you need to define and set up the processes to track the indicators. Each type of tracking indicator should have a resource plan associated with it and be regularly compared against actual progress.

The benefits from tracking are that project plans are up to date and therefore provide the basis for progress reporting to senior project and user management as required, to reflect the status of the project.

2.3 Time Recording

In order that actual time used can be plotted against the plan, some form of time recording is necessary. This can be applied to all persons working on a project to assess the project cost, or, to arrive at what a contractor will charge for Time & Materials (T&M). In the latter case, you may also need to track hours charged by suppliers.

The most common way to do this is to use timesheets, which staff fill in with the time spent on the project or project activities.

2.3.1 Cost Codes

In order for an accounting process to take place Cost Codes may need to be introduced. This is usually standard practice in an application development environment but may not be elsewhere. You will need to decide what level of breakdown is required in the accounting and reporting and separate codes will need to set up. These are then used



with a minimum unit of time recording by the staff working on the project and usually recorded on timesheets.

2.3.2 Timesheets

There are many variations of timesheet with increasing amounts of detail. You should identify what is required and produce the simplest form. An example is shown at the end of this topic. The table below gives some ideas:

- Project Requirement Timesheet Required
- Staff supplied at hourly rate
- One cost centre only Daily hours required
- Multiple cost centres Daily hours required + cost codes
- Staff supplied at daily, weekly or longer period rate
- One cost centre only Attendance sheet only
- Multiple cost centres Daily hours required + cost codes

2.3.3 Reporting Periods

Timesheets are normally filled in daily, accumulated into weeks and then reported against some accounting period. This is usually a week or a month. In reporting against an accounting period the resource plan needs to be built around the accounting period in order that actual time can be accurately mapped on to the planned time.

Note: Your company and its suppliers may use different accounting periods. This cannot be changed and will always lead to confusion. It is well to realize this in advance and tailor the time recording to include the different mechanisms.

One of the reasons for being particularly careful and keeping accurate records at this stage is to be able without much additional effort to agree, or disagree with reasons, the bills that will inevitably be passed to you for authorization of payment at some time in the future.

2.3.4 Spreadsheets

The simplest way to hold timesheets over an accounting period for a number of people is in a spreadsheet. This has the advantage of being a repeatable process for each time period and allows manipulation of the data, once entered. Also when charging rates or costs are required these can be easily added. These are discussed in a later topic. You will probably be familiar with a particular spreadsheet package and should exploit the report creation facilities to add to the project reporting that will be required in this area.

Figure 4 is an example of a monthly (four weeks) spreadsheet:

Name	Wk 1 - hrs	Wk 2 - hrs	Wk 3 - hrs	Wk 4 - hrs	Total
Name - A					
Name - B					
Name - C					
Name - D					
Name - E					
Total					

Figure 4 Example of a Resourcing Spreadsheet

An individual's time is recorded in columns for each week and totalled across and down for statistical analysis.

2.3.5 Tracking Task Hours Worked

Resource plans and timesheet summaries are the basis for what is a major responsibility for you; that of time management of your people. This is closely linked with resource cost, so is the basis for financial control. The administration of resource plans and timesheets can be delegated, but analysis and the decisions that have to be made are clearly yours.

Possibly your key role as Project Manager is to maximize the utilization of your available resources, from both a task and cost point of view. Therefore, it is vital that you plan in detail the resources required and manage any variances to these plans as an effective means of controlling the project.

Consider the example in Figure 5. What does this show?

Activity	Who	Hrs	Jan	Feb	Mar	Apr	May	Jun	Jul
task1	A	n1	===	----					
task 2	B	n2		===	-----				
task 3	C	n3			---				
task 4	D	n4			-----	-----			
task 5	E	n5			--				
task 6	F	n6		==	===	===	=====		
					===	=====			
			===	=====	=====	=====	=====	=====	
Total									
			xx	xx	xx	xx	xx	xx	

Figure 5 Gantt Chart With Effort Used

Remember, time now is end of February. Does this chart mean:

- The project is behind?
- The project is ahead?
- The resource plan is wrong?
- The project will overrun and cost more?

It could mean all or none of these. The only thing that can be deduced is that the people are working at a different rate and timescale to the plan as at the end of February. There will be reasons for this and the art of resource management is to understand all of these and identify which need to be addressed. For example, D has worked all hours allocated up to end of April. This is good if the task is nearly finished, implying the project is ahead. If, however, the task is only 2/5ths completed, but 4/5ths of the resource has been used, the implication is that this task will cost twice the estimated amount of time (and money). Similar arguments, and variations, can be made for the other activities. This is taken a step further in the example, later in this topic.

Similarly, time worked can be added to the other charts as described earlier, where additionally 'o' indicates the actual against the plan shown as 'x'. The time worked can be shown on an Accounting Period basis (see Figure 6) or on an accumulated basis (see Figure 7).

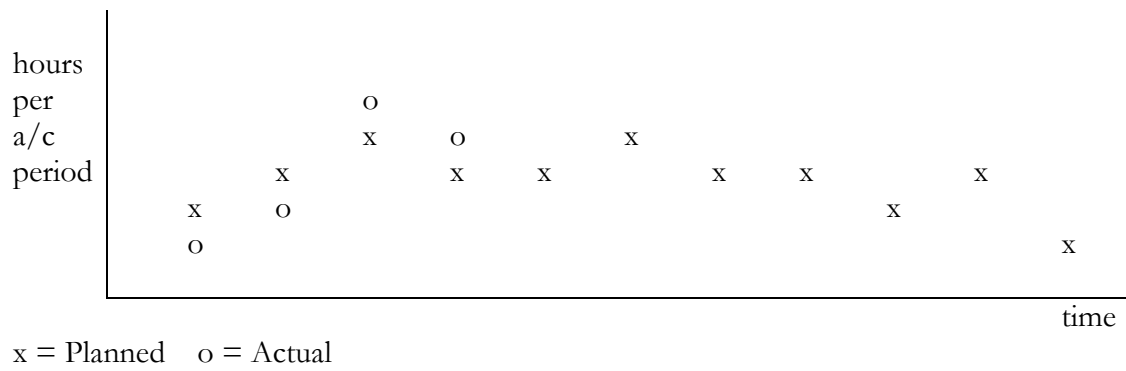


Figure 6 Task Hours Tracking Graph

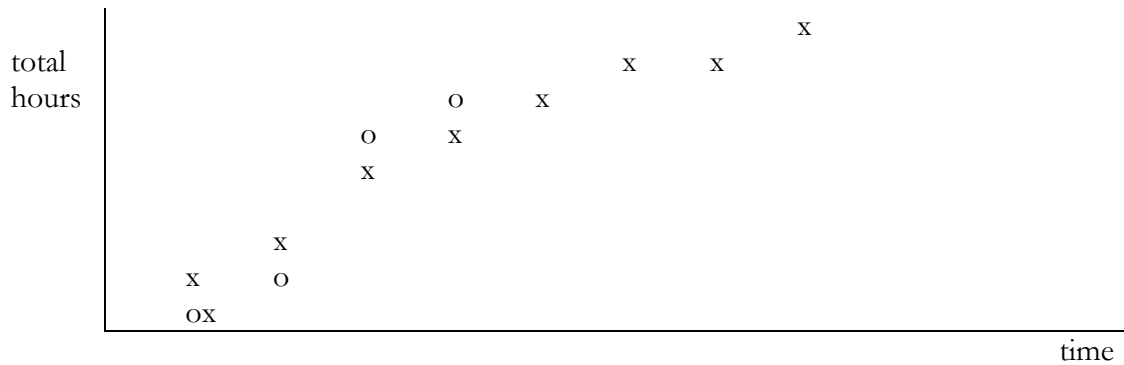


Figure 7 Cumulative Task Hours Tracking Graph

Both of these examples show resources being applied a bit late after the project start, but then at a rate above what was planned. This may or may not indicate problems for the same reasons as indicated above.

It should be noted here that tracking of resource against plan does not measure progress or project cost, only expense to date. It is the experience and expertise of you that are called upon to understand and make estimates and judgements and take appropriate action where necessary.

All of the above processes of time recording will give a resource total, and therefore cost, at the project end. What is required during the project is an indication of over or under estimation of resources as the project progresses. This can be done by analysing the timesheet information on a regular basis, such as at the end of every accounting period. Over or under performance at the activity or task level provides you with the opportunity to probe into the reasons and take action, or not, as necessary. At the end of the each accounting period the updated charts will indicate whether the previous action was sufficient or further action is required. This relies very heavily on your experience and the way that the project is being run.

After investigation, you take the following actions:

- Request D to re-estimate the work on the basis of having used 4/5ths of resources in 2/5th of the time.
- Confirm that E managed to start early and on track to finish early, therefore no action required.
- Press A to add resource to complete the activity within two weeks, and confirm that this can be achieved.

The only worry for you at this time is D. The chart at the end of March is shown in Figure 8.

Activity	Who	Hrs	Jan	Feb	Mar	Apr	May	Jun	Jul
task1	A	n1	===	==C					
task 2	B	n2		===	==C				
task 3	C	n3			===	-----			
task 4	D	n4		==	===	===	===		
task 5	E	n5			===	=====			
task 6	F	n6	===	===	===	-----	-----	-----	



Total			XX	XX	XX	XX	XX	XX
-------	--	--	----	----	----	----	----	----

Figure 8 Gantt Chart-March

A and B have completed their activities within their resource estimates, shown with a C above. C, E and F are working to plan, although E is still a month ahead. However, D has used more resources than originally estimated, but after re-estimation has informed you that twice the resource is required to complete the job.

After consultation, you take the following actions:

- Request a revised resource plan from the Project Office planner with surplus time from A and B given to D.
- Calculate the additional time for D (and maybe add some contingency) and request this be added into the revised plan to D.

The only worry for you at this time is the cost of the additional funding to resource D. Your experience will have led you to have some contingency and maybe some extra may be coaxed out of C, E and F. Once again this is specific to a particular circumstance and is part of your responsibility.

The revised resource plan is used to map the time used in April is shown in Figure 9.

Activity	Who	Hrs	Jan	Feb	Mar	Apr	May	Jun	Jul
task1	A	n1	===	==C					
task 2	B	n2		===	==C				
task 3	C	n3			===	==C			
task 4	D	n4		==	===	===	-----		
task 5	E	n5			===	===	-		
task 6	F	n6	===	===	===	===	-----	-----	
Total			xx	xx	xx	xx	xx	xx	

Figure 9 Gantt Chart-April

The chart confirms that D is now working to plan (the initial plan was underestimated). E is still working one month ahead and confirms a completion date end-June, to resource plan. F is a little ahead and has indicated an ability to bring the end-date forward with the use of some extra resource. Assuming you were able to gain additional funding for D, there should be no problems with the resource plan and there is every indication that the project will finish ahead of time and within the revised budget.

Note: The above example is for resource (and ultimately resource costs) only and does not give any indication of progress, other than completion of activities. These should be part of milestone tracking and progress management.

As a result of analysing the time worked against the plan and the cost of the work against the budget, you have to assess any actions that should be taken. By imposing a cycle around an accounting period, and suitable reporting, there is a natural time to assess what actions should be taken. The following gives some scenarios and possible actions. These may, or may not, be appropriate in all circumstances.

Given a set of tasks most people work in a set pattern, peculiar to themselves, or the environment in which they have to work. Some examples are:

- Late starters/finishers (such as 9:30am to 7:00pm)
- Early starters/finishers (such as 8:00am to 4:30pm)
- Long days (such as 8:00 to 9:00pm)
- Short days (such as 10:00 to 4:30pm)

All of the above are acceptable as long as the work and budget proceed to plan. If the contract is Fixed Price, or if T&M is at a daily rate, the hours worked daily may not be important (within the bounds of acceptable levels of work). However, if the contract is T&M, it is possible to 'overspend' because the people are too keen and the planned rate of work, often estimated at 37.5 hours a week, is too low. In this case you need to take action to 'slow down' the rate, advise on an overspend, or ensure the project finishes early, when the budget limit is reached. Actual average working of 45 hours a week against an estimate of 37 hours might mean:

- A potential uplift of over 20%, on a T&M hourly rate contract.
- An extra 20% of work for nothing, on a daily rate T&M contract.
- A reduction of 20% in any profit margins, on a fixed price contract where staff are paid for overtime.

Alternatively, where travel is not included in the charging structures, travel time may eat into the working time such that the working rate is lower than the estimate. In almost all cases this affects progress and this will require action from progress review. The problem of estimated hours being used too slowly has to be addressed in the context of progress and perception of the charging algorithm. In Fixed Price and daily T&M, shorter working days by contract staff will be a problem from the start. Management will believe that the team is 'slacking', lacking commitment, and so on.

However, charging actual project hours in a shorter working day suits T&M hourly charging, where a great deal of flexibility can be achieved. Only relevant work is charged. The only item to watch is that progress is to plan. As a benefit, T&M contracts, where the rate of time worked is slower than planned, can often give contingent time and budget to fund some of the changes or 'out-of-scope' requests that tend to plague you. Management of all these things is part of your responsibilities. Staff are assumed to become available as the plan dictates, but often are early or late due to other commitments. This implies either a change to the plan or revising actual start and finish times. It is important for you to be aware of these because:

- Starting early, but finishing on time implies an overspend.
- Starting late, but finishing on time implies an underspend.
- Starting early and finishing early, could mean anything.
- Starting late and finishing late, could mean anything.

In these instances you need to assess the progress against the budget by accounting period and take action as appropriate.

2.4 Financial Tracking

Financial Tracking is of great importance as it demonstrates the project costs and the cash flow involved. This area of control on projects is unfortunately often overlooked, as more emphasis is placed on project progress. Cost control is a strong contribution to profitability.

The project will have an estimated budget from quite early on. This will include many items. In this topic we are only concerned with that part that arises from the hiring of supplier resources, contracted labour, or permanent staff. The part of the budget plan that is relevant to this topic is derived solely from the resource plans, once the terms conditions and rates of the contract staff have been agreed. This topic looks at aspects of financial tracking that can be applied to a variety of situations, starting with a discussion of the cost of people resources in the delivery of some part of the project.

In general the cost of people is applied to the cost of the project in one of two ways, though occasionally as a mixture of both. These two ways are 'Fixed Price' (FP) or 'Time and Materials' (T&M). Fixed Price is used in building of standard items where the scope of the work and cost to the supplier is well known. Where the people effort is not so well defined a supplier will insist on the people being charged at T&M. Financial control

of staff in a project becomes very important since this is usually the highest single cost centre. At first sight it would appear that control in the T&M situation is the most important as there is the potential to increase costs with overrun of the project whereas in a FP situation the cost would be the same no matter how long it took. However, since we are looking at the cost of people, if the time element associated with people is not well defined both methods will end in disaster if there is any uncontrolled overrun.

Thus, whether the people resources are supplied under FP or T&M, you should assess how well the scope of effort is defined and put into place the controls to ensure that you know to the appropriate level the costs of your people.

For information on earned value tracking, see the Financial Management Guide.

2.4.1 Project Resource Budget By Accounting Period

The graph in Figure 10 looks all right, assuming that the costs are linear.

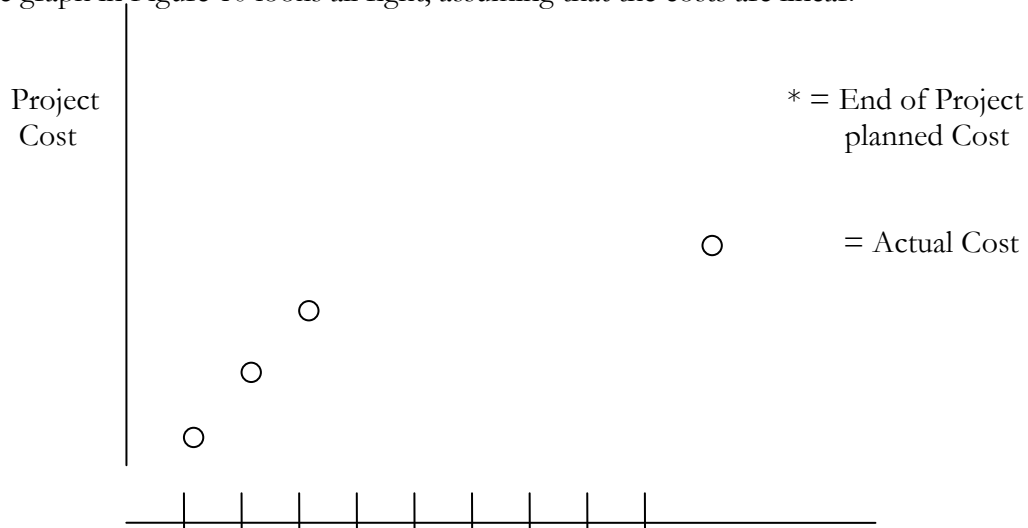


Figure 10 Resource Budget Plan

However, what is really required is a cost plan by accounting period. In the graph in Figure 11, the costs for each accounting period have been calculated and shown.

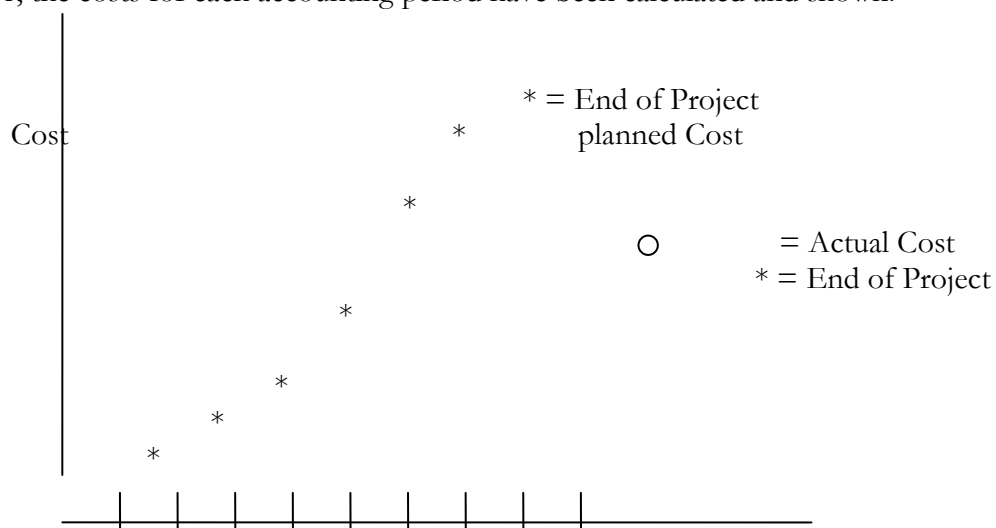


Figure 11 Resource Budget Plan by Accounting Period

This information may be available from the planning tool but, if not, it can be obtained by adding the planning information into the resource spreadsheet and cost calculated.

If actual costs are added to Figure 11, what was acceptable is now not acceptable, although tracking linearly the project cost is way over the plan. See Figure 12.

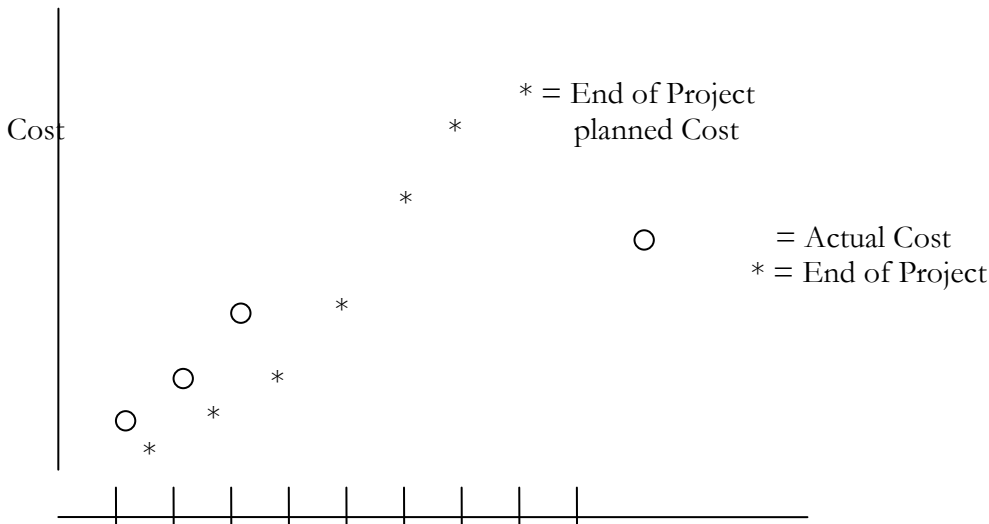


Figure 12 Resource Budget Plan Tracking

Thus there is a need for you to keep track of the resource costs by accounting period and to understand the implications of the chart. It is a desire that most projects complete ahead of time and often additional resources are added early on in attempt to do this. This implies that costs will be ahead of plan. If progress is also ahead this may be being achieved. It is your task to assess an increased cost rate against progress to judge whether the project will finish early and within budget, or that the project progress only proceeds to plan (or is behind), with additional resources, in which case the budget will be overrun. Beware of the project where even though it appears to able to complete ahead of time, when that time comes the resources don't go away. There are many reasons why they must stay, and someone must pay for them.

2.4.2 Resource Budget Spreadsheet--Costs

The planning tool may be able to provide an accounting facility to enable supplier invoices to be checked. Some planning tools may allow data to be exported into a spreadsheet alongside timesheet data, or a spreadsheet alone can be used. Spreadsheets are designed for this purpose and, taking the example shown earlier, can be used to record the costs directly from the completed timesheets. The advantage of using a spreadsheet is that a model can be built for the accounting period that can include all the necessary summaries and reports and be used cyclically.

The example shown in Figure 13 is similar to that used earlier, extended to include the rate of each person to give cost totals for the accounting period. Such charts by accounting period are invaluable for invoice checking, trend analysis, audit, and so on, and should be filed as part of the project history records.

Name	Wk1		Wk2		Wk3		Wk4		Total	
	hrs	Cost	hrs	Cost	hrs	Cost	hrs	Cost	hrs	Cost
Name -A										
Name-B										
Name-C										
Name-D										



Name -E	-----	-----	-----	-----	-----	-----	-----	-----	-----
Total	-	-	-	-	-	-	-	--	--

Figure 13 Resource Budget Spreadsheet

Another advantage of this spreadsheet approach is the ability to 'cross-foot', that is, to check totals both ways, across and down.

2.4.3 Tracking the Cost of Resources

The above totals of resource cost by accounting period can be further recorded, or extracted, into a summary chart, by people, by month, as appropriate to give any accounting statistics that are often required to plan or summarize the work. See Figure 14.

Name	Mth1 hrs	Cost	Mth2 hrs	Cost	Mth3 hrs	Cost	Mth hrs	Cost	Total hrs	Cost
Name -A										
Name-B										
Name-C										
Name-D										
Name -E										
		-----	-----	-----	-----	-----	-----	-----	-----	-----
		-	-	-	-	-	-	-	--	--
Total										

Figure 14 Resource Budget Spreadsheet

This chart is then the basis for the 'actual' figures plotted in the Budget Performance chart. See Figure 15.

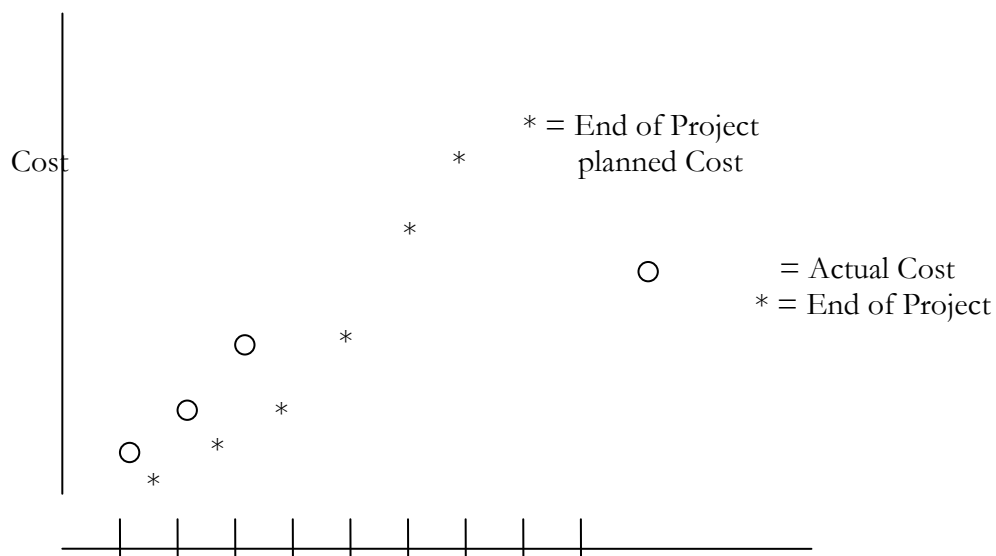


Figure 15 Resource Budget Tracking Graph

3 How Do You Track Progress?

Three powerful techniques are recommended for progress tracking. Used together they provide a clear view of both the general status of the project and areas of progress.

- Within MITP, project and subproject milestones are the most widely used tracking indicator. They are project independent and applicable from the smallest to the largest project. Milestone tracking is particularly suitable for reporting progress to a higher level of management (for example, from you to the Project Sponsor or the steering group; or from a Subproject Manager to you). It offers a method of presenting meaningful summary information about a project, instead of the masses of low-level data that many systems provide. Milestone tracking is also useful in motivating and driving project team members to achieve particular targets.
- A similar technique to milestone tracking is work package tracking, where work package start and completions are recorded as milestone events. This is an easy way to produce a set of tracking indicators from a Work Breakdown Structure. It has the advantage that it shows progress through the work of the project.
- Effort remaining tracking is a way of tracking and communicating project progress. The method is based on the periodic measurement of the amount of effort required to complete the project. This starts from the total estimated effort and ends at zero, when the project is complete. This method has the advantage of capturing the latest estimates to finish the project, based on the working knowledge, but needs more time to understand and manage than the other two.

Subtopics

- 3.1 Milestone Tracking
- 3.2 Work Package Tracking
- 3.3 Effort Remaining Tracking

3.1 Milestone Tracking

This chapter looks in more detail at milestone tracking.

Milestone tracking is a technique for tracking, controlling, forecasting and reporting the progress of a project in a highly summarized fashion.

3.1.1 Choosing Project Milestones

In any project it is usually possible to select, right at the outset, a number of events whose completion represents significant progress towards the successful completion of the project. At the time that you select these milestones, you may not always be able to guess the dates on which they will be reached; but that does not prevent you from recognizing the events themselves quite clearly.

Suppose that your project is to move house following a change of job. You might construct the following list of milestones:

- Suitable area chosen
- House chosen
- Finance arranged
- Contracts exchanged
- Building alterations decided
- All building work completed
- Move of furniture completed
- Last box unpacked

You will notice that this list includes events which are clearly significant, even though we don't yet have a plan which puts dates against them. You will also see that each milestone is phrased in a way which makes it very black and white; 'contracts signed' is a good milestone, since it has either been reached or not; there is no room for doubt. 'Contract completion' would be a bad milestone: is that reached when a date has been set for completion?; or when legal negotiations are under way?; or when the contract documents have been finalized?

In choosing milestones, you must consider which events are significant, and also how many milestones you should have. Some events are obvious candidates for milestones. If you were implementing a stock control system that involved installing small computers in each of several depots, milestones might include:

- First depot computer installed
- Stock control system implemented in first depot
- Stock control system implemented in final depot.

A less obvious one might be 'First staff training course completed'. To achieve this implies that trainers have been selected and trained; documentation written; training facilities installed; and the application system has been sufficiently tested to be useful for training.

Another milestone might be 'Press conference held'; this may be somewhat peripheral to the project, but may be chosen because its visibility gives it political significance.

In general, at the top level a project should have at least 10 milestones, but less than 40. Thus if it is a five-month project, you should probably aim to have one milestone every week or so; if it is a five-year project, then one milestone every couple of months would be appropriate. Each subproject might have a similar number of milestones; some of these will figure in the top level list as well.

Once you have chosen your milestones, and done some further project planning work, you will be able to put a planned date against each milestone. Then you can use the milestones for tracking and control. At appropriate intervals, you can see whether the milestones that should have been reached by that date have actually been reached; and you can forecast new dates for those which fall due in the next few weeks. You can track this information on a simple report and it gives you an immediate impression of how well the project is meeting its planned dates.

3.1.2 Choosing Subproject Milestones

Just as milestones can be chosen for a project, so they can be chosen for individual subprojects. The guidelines for choosing them still hold good. For example, in our house moving project, we might decide that building work on the new house should be a subproject. Milestones might be as follows:

- Kitchen alterations decided
- Three quotes obtained for kitchen
- All contracts placed for kitchen
- Kitchen alterations completed
- Garage extension decided
- Three quotes obtained for garage
- All contracts placed for garage
- Garage extension completed
- All building work completed

Note that one of these milestones (the last one) is also a milestone for the overall project. Note also that we could not have defined all these milestones right at the outset of the main project because, until we have chosen a house, we don't know exactly what building alterations are needed. But we could identify all these milestones quite clearly at the start of the building subproject, even though (as before) we do not yet have target dates for them.

3.1.3 Using Milestones For Reporting

Each regular report should cover those milestones which should have been reached since the last report, and those due to be reached in the next two reporting periods. There should be about 8 or 10 of these in total (three due now, six due shortly) sufficient to give a reliable feel as to the health of the project, but sufficiently few to avoid confusing the picture.

The report should show clearly and graphically any slippage in the actual or forecast achievement of each milestone.

3.1.4 Using Milestones For Tracking, Controlling and Forecasting

At each level of management in the project we can use milestones for reporting upwards. If no slippages are reported or forecast, we can be fairly happy. If slippages are happening or are forecast, we can investigate the detailed activities which underlie these

milestones, and decide what corrective actions to take. The use of milestones makes it unnecessary for the reviewing manager to go into the detail of tasks and activities at a lower level in those areas which are going according to plan; this leaves you free to concentrate on the things that are not going so well.

The milestone charts in this topic show how you can track using milestones. These milestone charts combine two important factors necessary for managing projects:

- They show the overall project plans.
- They show the difference between original plans and actual achievements.

The planned milestone dates are shown as arrows on a single line at the top of the chart (numbered 1-5 in the example). A separate sheet should be used to relate these numbers to very brief descriptions of the milestones. For each week, the planned milestone dates are shown by a / symbol.

Whenever progress is reported new milestone achievement dates are forecast. All the forecasts are drawn on one horizontal line (or more adjacent lines if more space is required) with any slippage of milestones not achieved shown by +(+ ...) joining the planned date and the new projected date. As milestones are achieved, the / or + symbols are replaced by XXX symbols joining plan and actual completion dates.

If a milestone completes early, it is marked with a X and - symbols to join the completion date to the planned date. This, + indicates overrun and - indicates early completion.

A column to the right of each report contains the cumulative slippage or gain of milestones (the example uses days, but weeks or months are equally valid). This figure has no meaning in itself, but changes in it give an indication of the rate of slippage or gain.

In the example, the project milestones are in control in Weeks 1 and 2 (see Figure 16), drifting in Week 3, with major slippages in Weeks 3 and 4 (see Figure 17). This slippage carries over into Weeks 5 to 8 (see Figure 18), because of interdependencies between the milestones.

Weeks	1	2	3	4	5	6	7	8	Slip
Milestones		1-	2-		3-	4-	5-		
Week 1 report		/	/		/	/	/		0

Figure 16 After One Week

Weeks	1	2	3	4	5	6	7	8	Slip
Milestones		1-	2-		3-	4-	5-		
Week 1 report		/	/		/	/	/		0
Week 2 report		/+	/++		/	/	/		2
Week 3 report		XX	/++ +	+++	/	/	/		6
Week 4 report		XX	XXX	XXX	/++ +	+ /++ +	/++ +		18

Figure 17 After Four Weeks

Weeks	1	2	3	4	5	6	7	8	Slip
Milestones		1-	2-		3-	4-	5-		
Week 1 report		/	/		/	/	/		0
Week 2 report		/+	/++		/	/	/		2
Week 3 report		XX	/++	+++	/	/	/		6
Week 4 report		XX	XXX	XXX	/++	+	/++		18
					+	/++	+		
Week 5 report		XX	XXX	XXX	/++	+	/++		18
					+	/++	+		
Week 6 report		XX	XXX	XXX	XX	XXX	/++		18
						/++	+		
Week 7 report		XX	XXX	XXX	XX	XXX	/++		18
						XX	XXX		
Week 8 report		XX	XXX	XXX	XX	XXX	XX	XX	18
						XX	XX		

Figure 18 At the End of the Project

3.1.5 Subproject Milestones As Tracking Indicators

From the subproject plans, the overall plan, and the subproject definition, a set of subproject milestones has been established that can be tracked as tracking indicators. These show at a project level, the progress of the project. When all is going well the actual line is close to the planned line on the graph, when subproject milestones begin to slip the curves diverge and further action is required. This simple process highlights the need to take further action and will cause you to investigate further. The areas for investigation will be shown via differences in the plan and actual dates on the tracking indicator sheet.

An example is shown in the table in Figure 19. The data is shown graphically in Figure 20.

Month			Month:
Progress Indicator Sheet			Month:
Project:		Phase:	Date:
Progress indicator S/p Milestone		Plan no	Page of
Tracking Period	Planned Value	Actual Value	Comments
May	10	8	No problems
June	20	17	Slight concern with subproj 2
July	25	23	OK now
August	38	30	Resourcing problems at subproj 1
September	52	40	Holiday period not planned well
October	70	67	Forecasts indicate back on track

November	82		
----------	----	--	--

Figure 19 Subproject Milestones as Tracking Indicators

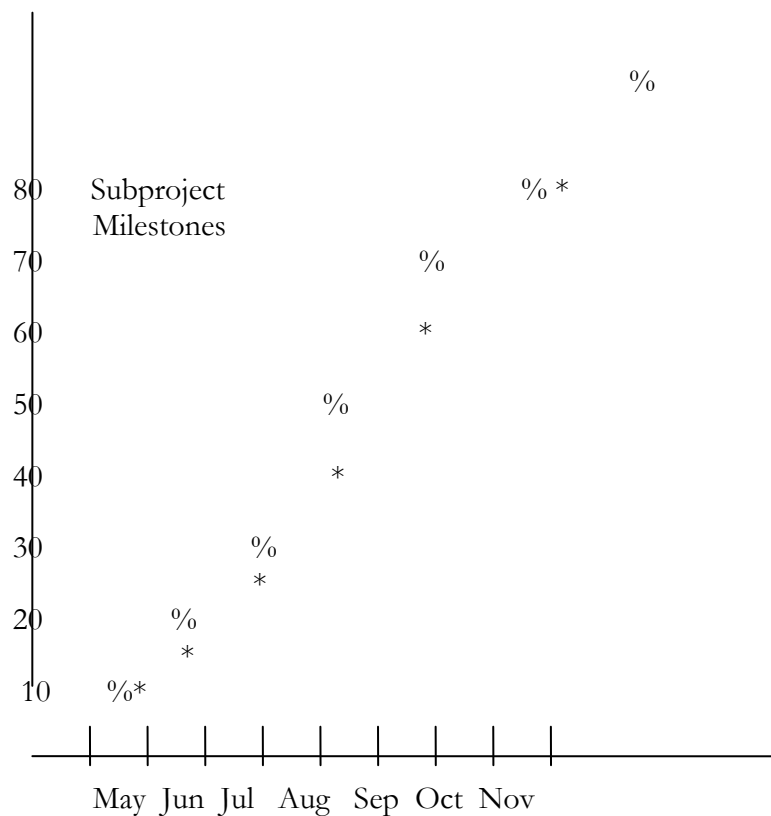


Figure 20 Graphical Representation of Subproject Milestones as Tracking Indicators

Note: An alternative method of plotting the indicators remaining can be used where changes are continually increasing the number of tracking indicators. This is described in the Progress Reviewing Guide.

3.1.6 Milestone Progress Table

- Progress of milestones may take the form of a table which should include the following:
- Milestone number
The suggested format is 'SS.nn', where SS is the number of the subproject and nn is the milestone number with the subproject. This allows milestones selected to represent the overall project progress to retain a single identifier.
- Milestone definition
A description of the major activities or deliverables completed by the end of the milestone.
- Target date
The date by which all the tasks for the milestone should have been completed.
- Outlook date
This column should contain the date by which it is currently expected that the milestone will be completed.

Note: As a general practice it is recommended that the dates provided for milestones

be the Friday following the expected completion. This brings it in line with weekly reporting, which is based on the project status at the end of the week.

- Progress Tracking Guide
- Work Package Tracking



3.2 Work Package Tracking

This topic describes a technique for tracking, controlling, forecasting and reporting the progress of a project from the work packages defined in a Work Breakdown Structure (WBS). This technique, known as Work Package Tracking is particularly suitable for reporting against a WBS plan.

Work Packages are part of the Work Breakdown Structure approach to planning. In summary, the WBS shows a top-down view of the work of the project, usually based on the deliverables. The structure is successively broken down into more detail, as follows.

Item Description

Major Deliverables The WBS identifies the major deliverables such as applications, training, specifications, equipment, and so on.

Components

The deliverables are then divided into component parts such as systems or subsystems.

Work Packages

The components are further subdivided into the individual constituent items, such as application module.

Activities/Tasks

The work packages are divided into lower levels of activities and tasks, which are units of work required to complete a specific job, such as a report, a module, a design, and so on.

All of the above layers may not appear in the WBS but should contain at least work packages and, if possible, tasks. The task is the lowest level of planning and will be estimated in man-hours or, at most, man-days. Tracking is performed against the lowest level in the WBS. This might be the work package or the task. At the component of work package level, the approach is similar to milestone tracking using start and completion dates as milestones, at the task level a time sheeting system is required and the approach method should then be 'Effort Remaining'.

Work packages and activities (groups of related tasks) may also be used as tracking indicators, recording starts and completions. The status can be recorded in the tables during the reporting process and then the starts and completions summed each period to form a graph. An example is shown in Figure 21. Note that, as with the subproject milestone graphs, a baseline plan needs to be drawn against which the actual dates are plotted over time. The planned and actual lines should be close to each other. Divergence of planned to actual in any pair indicates problems that require closer inspection.

$$\begin{array}{ccccccc} \text{Number of} & & \% & & & & \\ \text{Work packages} & & * & & & & @ \\ & \% & & & & = & \\ & * & & @ & & & \end{array}$$

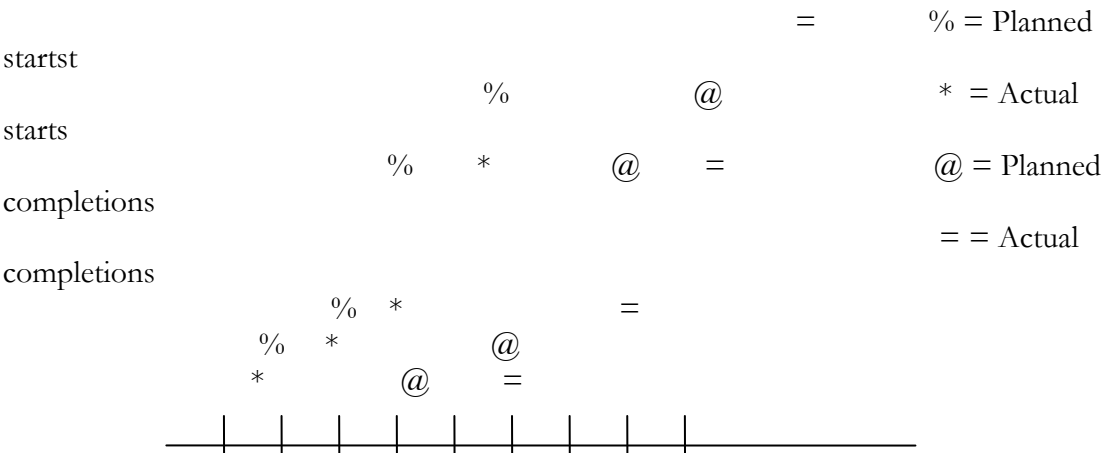


Figure 21 Work Package Tracking

Although there are pitfalls with tracking against task or activity starts (you could start all of them and complete none!) by tracking both on the same graph a good picture of progress though the work is shown.

An alternative method is to track the number of work packages still to be completed. This gives a downward sloping graph, where completion is when you reach the x-axis. This has the advantage of capturing increasing numbers of work packages being introduced into the plan, if there are significant changes during the project.

3.2.1 Example of Work Package Tracking?

This topic describes how you track using work packages by using as an example a project to modify a house following a house move.

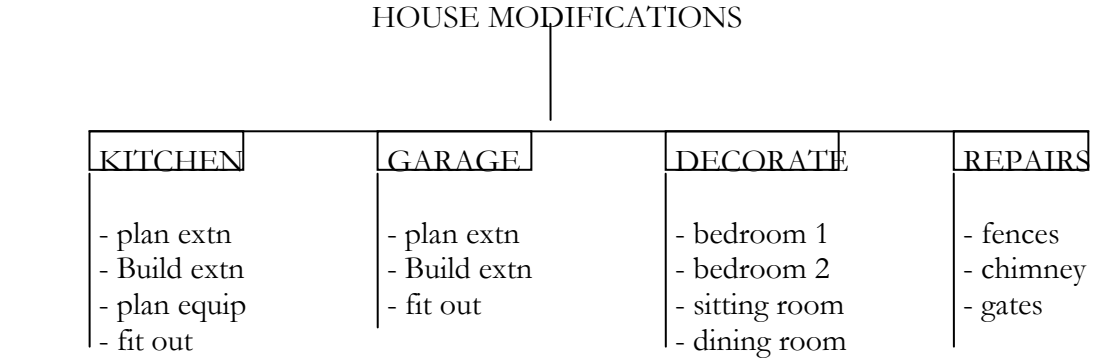


Figure 22 WBS example

In Figure 22, the boxes show the subprojects, and the lists below each subproject show the work packages. From the plan, the following table can be constructed showing the forecast start and finish dates. Note that each may be marked as S = started and C = completed.

Table 1. WBS Tracking Table at 20 March				
No		Status	Forecast	Forecast

			Start Date	Finish Date
K00	KITCHEN	S	1Mar	7Jul
K05	Plan extension	S	1Mar	30Apr
K10	Build extension		15Apr	7Jul
K15	Plan furniture		1Apr	1May
K20	Fit out		15May	30Jun
G00	GARAGE	S	1Mar	7Jul
G05	Plan extension	S	1Mar	30Apr
G10	Build extension		18Apr	7Jul
G15	Fit out		1Jun	30Jun
D00	DECORATE	S	1Feb	21Jul
D05	Bedroom 1	C	1Feb	15Feb
D10	Bedroom 2	C	20Feb	7Mar
D15	Sitting room		1Jul	15Jul
D20	Dining Room		7Jul	21Jul
R00	REPAIRS	S	2Jan	7Jul
R05	Fences	C	2Jan	7Jan
R10	Chimney		30Jun	7Jul
R15	Gates	C	1Jan	7Jan

As the project progresses, a better estimate of the start and finish dates can be made. The movement from the original dates to successive forecast dates may be important and can be tracked using the milestone charts discussed previously. The previous table shows the dates for the work packages by subproject.

3.2.2 Tracking Work Package Activities

A similar chart can be constructed for the activities within each work package, as shown in Table 2.

Table 2. Work Package Activity Tracking at 20 March				
No		Status	Start Date	Finish Date
K00	KITCHEN COMPONENT	S	1Mar	30 Jun
K05	Plan extension	S	1Mar	30Apr
K0505	Define requirements	C	1Mar	15Mar
K0510	Design extension	S	15Mar	15Apr
K0515	Appoint builder		15Apr	30Apr
K0520	Obtain permission		15Apr	30Apr
K10	Build extension		15Apr	7Jul
K1005	Clear site		15Apr	30Apr
K1010	Build base		1May	15May
K1015	Build walls		15May	7Jun
K1020	Build roof		7Jun	21Jun
K1025	Finishing		21Jun	30Jun
K1030	Install services		30Jun	7Jul
K15	Plan furniture		1Apr	1May
K1505	Design furniture		1Apr	1May
K1510	Design equipment		1Apr	1May
K1515	Procurement		1May	1Jun
K1520	Storage		1Jun	15Jun
K20	Fit out		15May	30Jun
K2005	Appoint installer		15May	1Jun
K2010	Delivery		1Jun	7Jun

K2015	Installation		7Jun	21Jun
K2020	Completion		21Jun	30Jun

The above list of activities could probably be broken down further into tasks. This point would probably be the starting point for entry into a software planning tool, which will then be repository for the information regarding dates and task starts and completions.

The above technique of tracking starts and completions as tracking indicators may be used, but if the project is correctly planned down to the task level, then a more accurate tracking method should be used.

From a task-level resource plan, costs can be tracked for the project. However, this can only be achieved using some form of timesheet system to record time spent on tasks. The tracking of time spent on taskwork is a common tracking method, requiring a detailed plan and time recording system. This technique can be extended to track using 'effort remaining', which provides a much more powerful method. This requires an additional piece of information to be collected on the timesheet, that of 'time required to complete the task'.

Thus for WBS task level tracking, it is recommended that you use 'Effort Remaining'. See "Effort Remaining Tracking" in topic 3.3 for more details.

3.2.3 Tracking Application Work Packages

The following example shows a WBS table with work packages broken down into activities. The forecasting dates are at the work package level, but the recording is at the activity level as started and completed. Tracking is shown in the Gantt chart following at the work package level.

The date now is April 1st.

Table 3. Tracking application Work Packages (1)				
No		Status	Start Date	Finish Date
2201	INWARD PROCESSING A Pallet Book in Grid processing Receipt pallet - delete/add notes	C	17Jan	1Feb
2203	INWARD PROCESSING B Inspection Primary pack/prepack Primary prepac	C	27Jan	17Feb
2205	INWARD PROCESSING C Marshalling Book in returns Put away View returns View outstanding putaways Allocate putaway slot	C	8Feb	21Mar
2207	INWARD PROCESSING D Load truck Move/unload truck	C S	3Mar	31Mar
2221	PICKING A Sttart pick/select zone /creat group View pick elements	C	1Feb	28Feb
2223	PICKING B Large part pick View pick group by w/stn Split pick group - 2 ops Call off single part	C	20Feb	14Mar
2241	DISPATCH A Internal client disp. List of disp. ser. parts List dist target vs act View dispatches by pt. no	C C C S	8Mar	26Mar
2243	DISPATCH B Lorry load for Cust dispatch Line up cases for Cust. dispatch	S	18Apr	6May
2261	MOVE Move View move queues	C	9Jan	14Feb



	Divert box Divert item from box View single box movement			
--	--	--	--	--



No		Status	Start Date	Finish Date
2361	WAREHOUSE CONTROL A View box contents View input work queues View summary of items List input work queues Change box priority	C C S S	13Feb	13Mar
2363	WAREHOUSE CONTROL B View part in pipeline Back up movement instr. Add/del/update part rec. List parts eligible deln List parts near end	S S	3Mar	3Apr
2365	WAREHOUSE CONTROL C Amend workstation record View workstation status List system event log Alter hardware conf'n Process failed insp item Process svpr action list		23Mar	21Apr
2367	WAREHOUSE CONTROL D List activity history List movement history View/list act. by part no		12Apr	11May

3.2.4 Tracking Against The WBS

Completed work packages are shown as 'CCCC' in Figure 23. Where work has started but is not complete the chart shows 'SSSSS'. If the work package is not started it is shown as '-----'.

Work Package	May	Jan	Feb	Mar	Apr
2201 Inward Processing A		CCCC			
2203 Inward Processing B			CCCCC		
2205 Inward Processing C			CCCCCCCCCCCC		
2207 Inward Processing D				SSSSSS	
2221 Picking A			CCCCCCC		
2223 Picking B				SSSSSSS	
2241 Dispatch A				SSSSS	
2243 Dispatch B					
SSSSSS	 				
2261 Move		CCCCCCCCCCCC			
2361 Warehouse Control A				SSSSSSSS\$	



Figure 23 Tracking Against the WBS

Figure 23 indicates that the Warehouse Control work packages are behind schedule and will require further investigation to assess why and produce a recovery plan to address. DISPATCH A may be behind, but work has started on DISPATCH B ahead of schedule. This also needs investigating.

3.3 Effort Remaining Tracking

Effort remaining tracking is a graphical technique for tracking progress in a project by measuring the work still to be done. The method is based on the periodic measurement of the amount of effort required to complete the project; this starts from the total estimated effort and ends at zero, when the project is complete. The planning of a project may produce a simple, straight-line graph, similar to that shown in Figure 24. Each week the current estimate of how much effort remains is plotted. The resulting graph can then be compared with the one drawn at the planning stage in terms of:

- The amount of effort remaining (more, less or the same as planned).
- The slope of the line (that is, the trend).

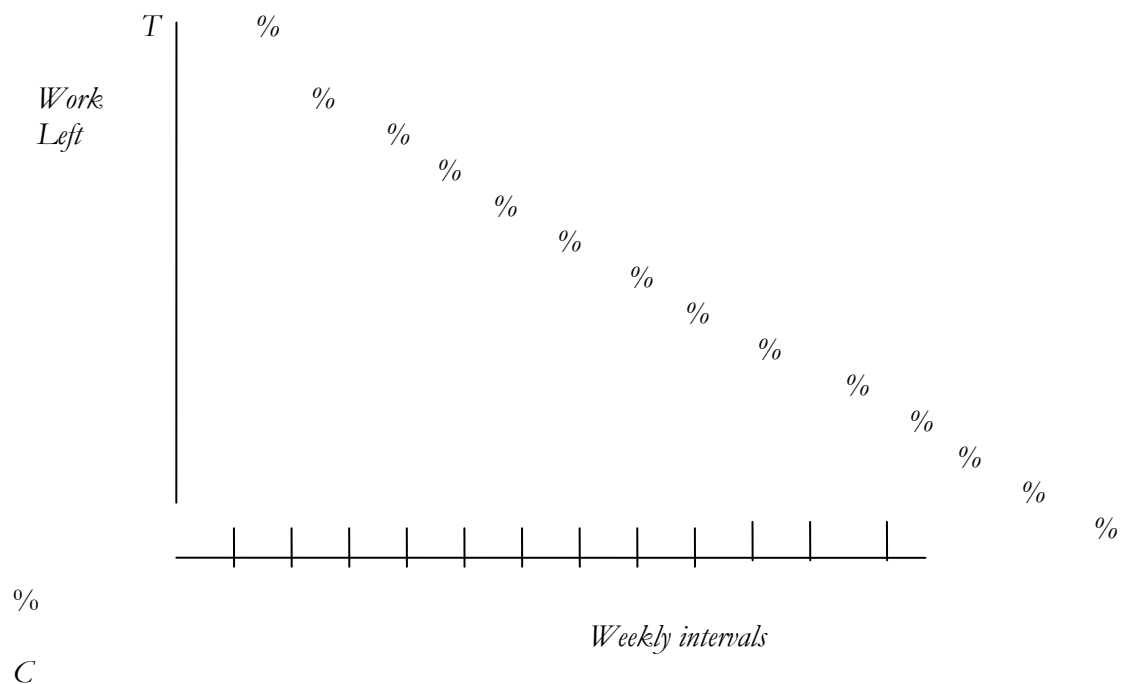


Figure 24 Simple 'effort remaining' chart (plan only)

The graph produced provides a very simple and clear picture of the overall status of the project for inclusion in weekly reporting; both upwards to management and downwards to the project team.

The graph is drawn this way up to emphasize the need to complete the project. Recording effort expended often hides the fact that the amount of work remaining is increasing, so the end of the project is moving further into the future!

The effort remaining technique is mainly suited to those projects where people and time are the most important resources. It has been used successfully in a number of projects including conversion projects and in all phases of Application Development.

This method is most effective in projects where the dependency between activities is relatively low, and where it is reasonably easy to interchange workers. This technique should not be the only tracking measurement, because it does not highlight individual

progress and neither does it give any indication of the cause of slippage. For example, the effect of one person being much slower than the others will only show up when it is too late to take action. Some form of milestone prediction is needed to complement this method.

The effort remaining technique is unlikely to be useful in projects constrained by external events or more than one critical resource, such as people and machine time.

3.3.1 Using Effort Remaining

To use the effort remaining technique for your project, you need to:

- Estimate the amount of work to be done.
To obtain the total effort, other than by complete guesswork, the project is broken down into a set of activities, commonly called tasks. Each task is then given an estimate using the chosen measure of work, as discussed earlier. The sum of these estimates is the total work to be done--the 'T' point.
The 'T' point represents the estimated work to be done, without any uplift for contingency.
- Estimate the elapsed time.
The work to be done must now be allocated across the resources available to do the work. This will result in a schedule giving start and end dates for the project. The end date of the project is called the 'C' point. The elapsed time should be based on the work-to-do being uplifted by the desired contingency percentage.
The contingent level of effort is the one that you expect to be needed in the end. The non-contingent level represents only those activities that can be foreseen at the planning stage.
- Draw the graph.
The 'C' point is the estimated end date--the point when there is no work left to be done! The simplest plan is obtained by drawing a straight line between the T and C points, see Figure 24 in topic 3.3.
A more realistic plan is obtained by taking the actual availability of people into consideration. This usually means a gradual build up of people at the start, with a gradual running down at the end. If the project takes place during the summer then there may be a period of low progress due to holidays. This will result in a chart something like the one shown in Figure 25.

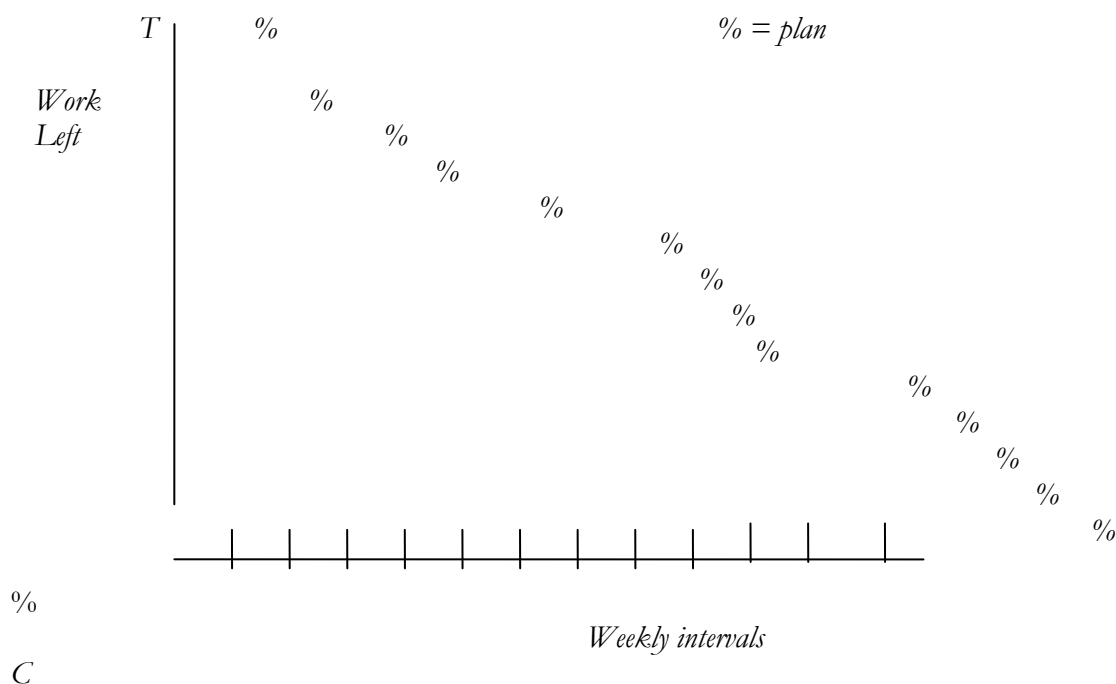


Figure 25 Typical chart showing build up, holidays and tail off

- Update the graph at regular intervals.
Effort remaining tracking consists of estimating each week how much work is left to be done in total, using the chosen measure of work. This will produce a point on the chart for that week.
Each task in the plan was originally given an estimate. For each task that is 'open' (being worked on), an estimate is needed at the end of each week for how much effort is needed to complete it. This is NOT the difference between the original estimate and the time spent on it so far; it is the person's best view on how much time he/she needs to complete it. For each task not started the original estimate is used. New tasks can be added in without disturbing the plan, they just increase the work left.

The weekly calculation is the sum of:

- Total of the effort left for open tasks.
- Total of the estimates for tasks not started.

This value gives the new actual point on the graph for this week.

A chart in use looks something like the one shown in Figure 26.

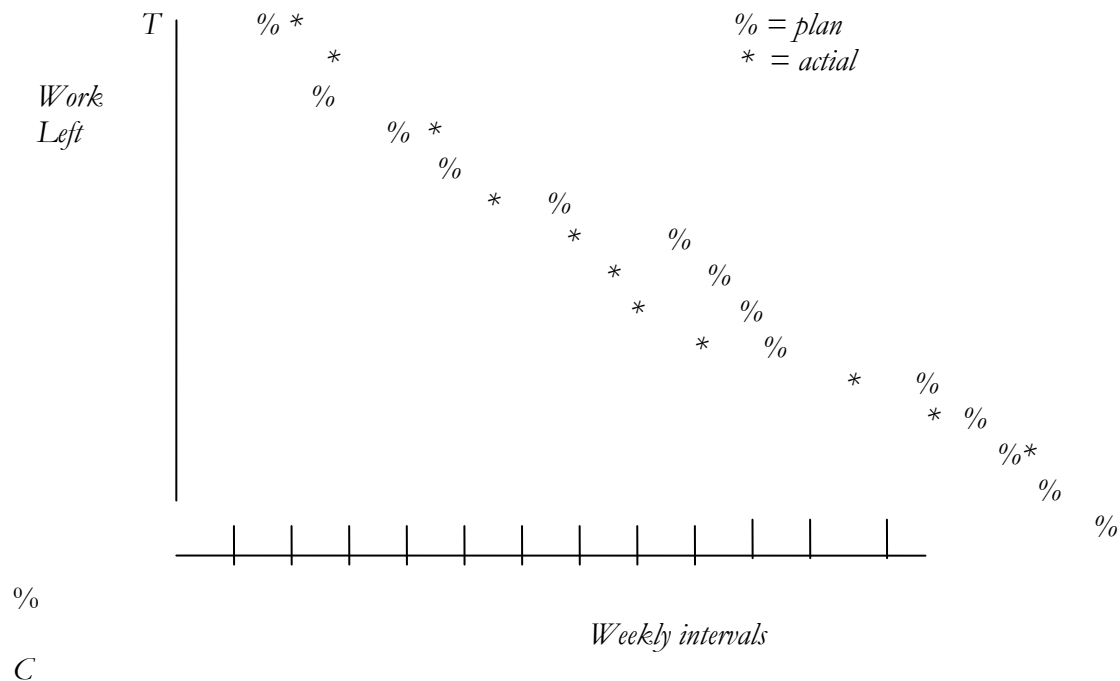


Figure 26 Typical chart showing actual versus planned progress

3.3.2 Interpreting the Chart

The weekly points are joined up to form an 'actual' line whose shape and direction can be compared to the 'planned' line giving information on:

- Status--that is, how far behind or ahead of schedule.
- Trend--the direction of the line can be seen to be going towards the planned end date, or away from it.
- Completion date--once a few weeks have passed it will be possible to rule a line through the average of the points. The point at which this cuts the horizontal axis is the projected completion date.

See the illustrations in Figure 27 and Figure 28.

An 'actual' point (*) below the 'planned' point (%) means that the project is ahead of schedule by the number of days measured horizontally between the '*' and the next '%' point (in a left-to-right direction), as in Figure 27.

Conversely, an '*' above the planned '%' means that you are behind schedule by the number of days horizontally between the '*' and the earlier '%' point (in a right-to-left direction), as in Figure 28.

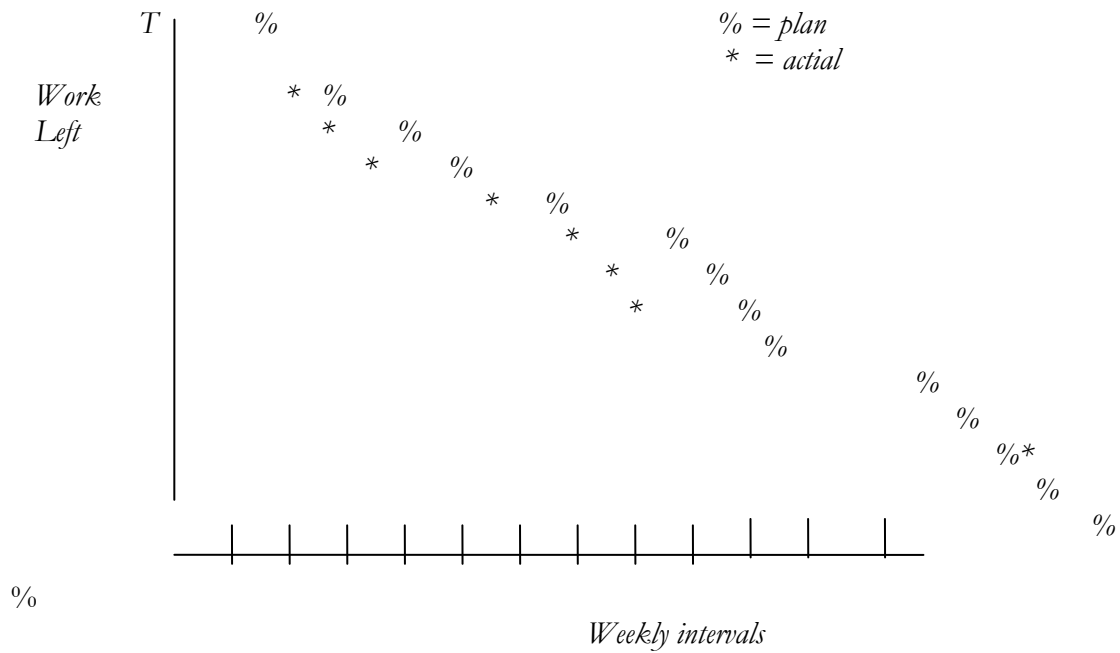


Figure 27 Example of a project keeping well ahead of schedule

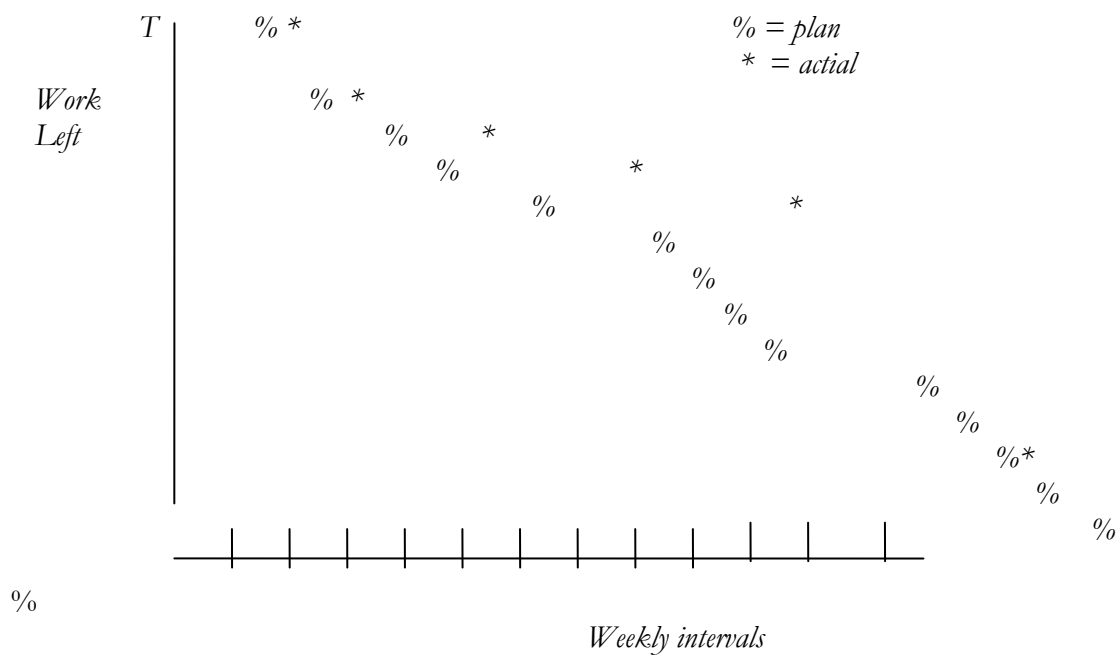


Figure 28 Example of a project going way behind schedule

3.3.3 Effort Remaining Using a Spreadsheet

This topic describes a method of implementing 'Tracking Progress On Effort Remaining' using spreadsheet and graphic products. An attempt has been made to avoid terms specific to a particular product or set of products.

The following diagram is an example of how the spreadsheet can be laid out. The annotation is as follows

'(n)' refers to description of spreadsheet area which follows example

'fn' relates to a formula

'kn' relates to an entered value



Milestones	(1) Start	1	2	3	(2) 4	5	6
Planned	k1						
Total weeks (3)	k2	f2	f2	f2	f2	f2	f2
Effort remaining (4)	f1						
Average effort/week (5)							
Actual							
Effort remaining (6)	f3	k3	k3	k3	k3	k3	k3
Current week (7)		k4	k4	k4	k4	k4	k4
Forecast (8)	f4	f5	f5	f5	f5	f5	f5
New average effort/week (9)	k5						

The spreadsheet areas are:

1. The initial values on the first Monday of the period to be tracked.
2. The values at the end of each week during the period to be tracked.
3. The planned total number of weeks of the period.
4. The planned effort remaining at the start and at the end of each week.
5. The planned average effort per week over the period.
6. The actual effort remaining at the start and at the end of each week.
7. An indicator to mark the current week being reported on a graph.
8. The forecast effort remaining based upon either the planned average per week or a specified new average effort per week.
9. A specified new average effort per week.

Each formula is written in 'pseudo-code'. There may well be alternate ways of obtaining the equivalent results in a particular product.

f1

'Planned average effort per week' =

'Planned effort remaining effort' / 'Planned total weeks'

f2

'Current week's planned effort remaining' =

'Previous week's planned effort remaining' -

'Planned average effort per week'

f3

'Actual effort remaining at start' =

'Planned effort remaining at start'

f4

'Forecast effort remaining at start' =

'Planned effort remaining at start'

f5

if 'New average effort per week' is not blank then

'Current week's forecast effort remaining' =

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'Previous week's actual effort remaining' -
'New average effort per week'
else
'Current week's forecast effort remaining' =
'Previous week's actual effort remaining' -
'Planned average effort per week'

k1 Planned total number weeks for the activity being tracked.

k2 Planned effort at the start of the activity (first Monday).

k3 Actual effort remaining at the end of each week.

k4 A value of 0 (zero) entered only under the current reporting week which places a marker on the X-axis of a graph to indicate the current week.

k5 New average effort for the week

To use the spreadsheet:

- Prepare the spreadsheet by:
 - Building the basic design as above.
 - Entering suitable names, dates or week numbers for the end of week columns.
 - Entering the formulae.
- Enter 6 in the total weeks to be tracked (k1).
- Enter 180 the total effort remaining at the start (k2).
- Perform the CALCULATE function.
- This will result in the following:

Milestones	(1) Start	1	2	3	(2) 4	5	6
Planned	6						
Total weeks (3)	180	150	120	90	60	30	0
Effort remaining (4)	30						
Average effort/week (5)							
Actual							
Effort remaining (6)	180						
Current week (7)							
Forecast (8)	180	150	120	90	60	30	0
New average effort/week (9)	-						

- Enter 160 in Actual effort remaining under Week 1 (k3), and put a 0 in Actual current week under the column for this week (k4), and perform a CALCULATE to simulate reporting at the end of Week 1. The spreadsheet should look like this:

Milestones	(1) Start	1	2	3	(2) 4	5	6
Planned	6						
Total weeks (3)	180	150	120	90	60	30	0
Effort remaining (4)	30						
Average effort/week (5)							
Actual							
Effort remaining (6)	180	160					

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Current week (7)		0					
Forecast (8)	180	160	130	100	70	40	10
New average effort/week (9)							
-							

- Note that the forecast effort remaining at Week 6 is 10, representing a slippage.
- Enter 32 in the New average effort per week (k5) and perform a CALCULATE. This should show:

Milestones	(1) Start	1	2	3	(2) 4	5	6
Planned	6						
Total weeks (3)	180	150	120	90	60	30	0
Effort remaining (4)	30						
Average effort/week (5)							
Actual							
Effort remaining (6)	180	160					
Current week (7)		0					
Forecast (8)	180	160	128	96	64	32	0
New average effort/week (9)	-32						

This shows that an increase of average weekly effort must increase by 2 hours to achieve the original end date.

The spreadsheet can be transposed into a graph as in the following example which shows a 10-hour slippage at the end of the first week. In all cases, the milestone week row provides the x-axis. The annotation is as follows:

* Planned effort remaining (from Planned effort remaining row)

+ Actual effort remaining this week (from the Actual effort remaining row)

+ Forecast (from the Forecast effort remaining row)

x Marker for current week (from the Current week row)

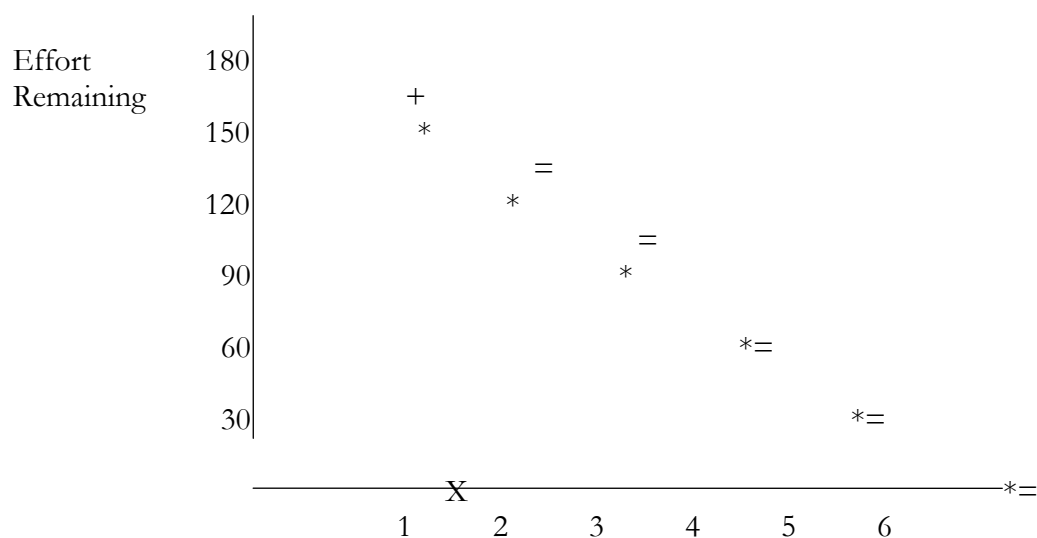


Figure 29 Effort Remaining Graph

It should be possible to produce a unique plot marker for each line on the graph to facilitate identification of the planned, actual and forecast lines.

Depending upon the specific tools used to implement this system, there are a number of opportunities for enhancement. For example, it should be possible to automatically calculate the remaining weekly average effort required, or to allow for availability of manpower week by week.



4 Progress Tracking Checklist

- Project Plans
 - Project milestones
 - Subproject milestones
 - Work breakdown structure and work packages
 - Task/resources plan
 - Deliverables plan
 - Budgets
- Data Gathering
 - Milestone achievement
 - Defined tracking indicators
 - Reporting cycle
 - Forecasting system
 - Timesheet system
 - Exception management systems
 - Issues
 - Change requests
 - Risk
 - Fault recording and log
- Data Analysis
 - Project Office support
 - Planner
 - Administrator
 - Methodology
 - Milestone progress
 - WBS progress
 - Effort remaining
 - Highlighting potential problems
 - Reporting systems and forms
 - Review meetings
- Corrective Action
 - Project Manager and Project Sponsor
 - Review meetings
- Team Reporting to Subproject Manager
 - Team actuals vs plan
 - Effort
 - Costs
 - Team milestones
 - Deliverables
 - Changes since last report
 - Issues and risks for subproject attention
 - Forecasts and outlook
 - Actions in place to address variances



- Subproject Manager to Project Manager
 - Subproject actuals vs plan
 - Effort
 - Costs
 - Subproject milestones
 - Deliverables
 - Changes since last report
 - Issues and risks for project attention
 - Project change requests
 - Forecasts and outlook
 - Actions in place to address variances
- Project Manager to Sponsor/Project Board
 - Project actuals vs plan summary
 - Effort
 - Costs
 - Project milestones
 - Major deliverables
 - Changes since last report
 - Issues and risks for executive attention
 - Change requests outside project manager's scope
 - Forecasts and outlook for project completion
 - Actions in place to address variances
- General project reporting and communications
 - Communications and reporting to:
 - Project members
 - Associated departments
 - External departments
 - The outside world
 - Procedures to:
 - Publicize the work of the project
 - Publicize the deliverables of the project
 - Market the deliverables of the project.



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**Readers' Comments**

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Progress Tracking Guide
Version C5.0

Publication No. MICG1TRK

Overall, how satisfied are you with the information in this book?

Legend:

- 1 Very satisfied
- 2 Satisfied
- 3 Neutral
- 4 Dissatisfied
- 5 Very dissatisfied

	1	2	3	4	5
Overall satisfaction					

How satisfied are you about the information this book contains:

	1	2	3	4	5
Accurate					
Complete					
Easy to find					
Easy to understand					
Well organized					
Applicable to your task					

Please tell us how we can improve this book:

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