Computers & Project Management CMI

Overview:
Once a robust and effective schedule has been created, and the project team know and have agreed to what is expected of them, then the project focus moves to execution and managing progress, which we will discuss this week. Also this week we will look at the considerations that need to be given to creating multi-project schedules and managing their progress.

Objectives:
- Gain an understanding of the links between the computer schedule and managing project progress:
  - Progress in a closed-loop control system
  - Management styles and the impact on tracking progress, including exception reports
- Cover updating project schedules and gathering project information:
  - Update frequency
  - Collecting progress information
  - Progress Checks
- Gain an understanding of the creation and maintenance of multi-project schedules
  - Multi-project model
  - Interface activities

Introduction

Managing progress entails keeping all project team members travelling in the one direction – the concepts of common goals, shared project mission, culture and organisational standards come into play here. Project management applications can assist within this process. Consistency of approach and formalisation of coding standards (standard values), update intervals (standard intervals), update requirements (common elements to be updated) etc. will all contribute to ensuring projects are executed with the consistency necessary to ensure the relevance of information. It is vital that the time is taken to keep progress accurately recorded, schedules & plans updated (e.g. new tasks or additional task break-out etc.) and to inform the relevant stakeholders in a timely manner as to current status.

Reporting and tracking progress can be as much about PR as it is about project management. You need to ensure that your reports reflect what is actually going on in the project though. Be careful not to over-cook the progress in the reports you are generating and always ensure the PM reporting system and your own "sense" of what's going on tally. One of the most important lessons any project manager can learn is to keep abreast of things as they happen on a project otherwise the project itself can become unviable. This is where applications and rules for updating schedules come in. Even the simplest applications play a vital role in the control of all projects.

Closed Loop Systems

This sounds complicated but it is not. The diagram below outlines a closed-loop control system. In general, these are systems that have performance measurement routines inbuilt. These measurement routines can recognise when there system is performing outside expected / required tolerances. They are capable of making internal adjustments themselves e.g. add more coolant, increase pump pressure etc.

The diagram below provides a representation of a closed loop system. This model can be applied to individual tasks or deliverables or entire projects.

The principle is simple: **command – measure – feedback – correct**. In an ideal world corrections would never take place but corrections are required on most projects.
Lock refers to these closed-loops as "cybernetic controls" due to its close analogy in electronics.
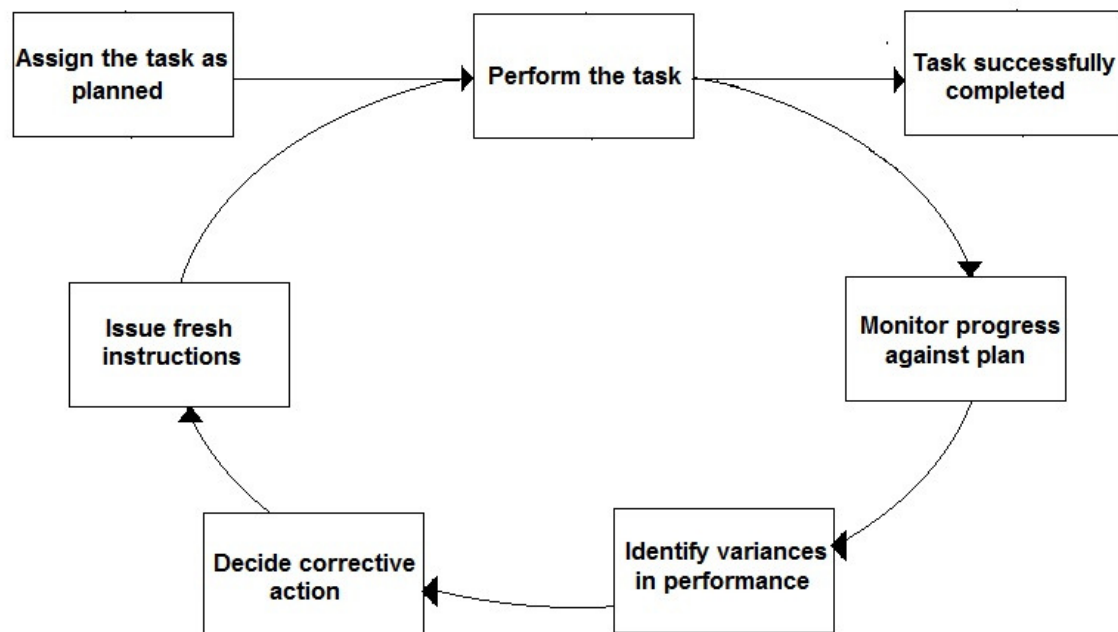

Figure 1 – Closed Loop

An open loop would mean that no corrections take place at all or no feedback is provided, meaning a task is "deemed" completed without confirmation that it has been completed successfully.

Generally speaking, systems should have some capacity inbuilt that demonstrates the following:
- Capacity to recognise system performance outside expected norms (i.e. under or over performance)
- A means by which adjustments can be made to the system to bring it back into the range of normal performance.
- Typically, these will exhibit the following capacity:
  - Ability to monitor
  - Ability to identify unwanted performance
  - Ability to incorporate changes to how the system operates

In project management terms, the project team becomes part of the system and, using the IT resources and reporting utilities available to them, they make adjustments to the project so that under performance (in particular) is corrected as swiftly and effectively as possible. Therefore, in its own way, a project team is a "system" that has been established to deliver a product for a sponsor / client.

Management & Reporting Styles
Management styles can have a significant influence on project performance and success. Organisational behaviour and culture can set the tone within an organisation overall and also within a given project or programme (of projects). On a project team, management styles can refer to a number of different things such as: forceful; commanding; adversarial; teaming; partnership etc. Each can be a style that suits the project and / or organisational context and can

be deliberately "chosen" as a management strategy by the senior project managers and sponsoring organisation.

In terms of reporting and status updates etc., there are a number of ways that a project can elect to monitor and report progress, over time. Some examples of these are outlined below.

Management by Exception & Exception Reports
The closed-loop control system shown above is dependent on the feedback of 'error signals' known to project managers as "variance" or "exceptions". These exceptions then facilitate "management by exception".

"Management by exception" is an accepted and effective approach to control. It means concentrating attention on project problems rather than wasting management time on tasks that are going according to plan and need no action.

Exception reporting is an essential element of management by exception. The PRINCE2 methodology relies heavily on exception reporting. In project terms, exceptions are those issues that arise that the project manager cannot fix and have a direct impact on the time, cost or scope of the project. Exceptions require a decision from the Project Board or project owner before the project can progress.

An Exception Report should generally include the following:
• Description and Cause of the Deviations
• Consequences of the Deviation
• The Available Options
• Options Appraisal
• Business Case – for the options available
• Risks
• Recommendations
• Sign Off

Management by Objectives
"Management by objectives" is another recognized technique, long championed by Peter Drucker (Management guru). Objective setting and meeting those objectives is what project management is all about.

It helps to remember that project objectives should always be SMART:

1. **S**pecific – Objectives should specify what they want to achieve.
2. **M**easurable – You should be able to measure whether you are meeting the objectives or not.
3. **A**greed - Are the objectives you set agreed with whomever is expected to meet the objective?
4. **R**ealistic – Can you realistically achieve the objectives?
5. **T**ime-bound – When do you want to achieve the set objectives?

Manage by Walking Around
Lock also espouses a less well documented management technique for the project manager to adopt, namely "management by walking about". What Lock means is that the project manager cannot live in a cocoon but needs to be aware of what is actually happening on the ground with a project. This allows the project manager "an opportunity to give praise where praise has been earned, and offer encouragement so that project staff remain motivated for success."

What is learned on these 'walkabouts' should then be punched into the project schedule, if it is appropriate to do so. Walk-abouts like this can also provide a very valuable source of information

in relation to for example: issues, risks, threats, opportunities, innovations, HR problems, lack of team synergy etc.

Updating Project Schedules

The project plan sets out the objectives for the project, including the times, resources, scope of requirements etc. As the project progresses through the project life cycle the original plan and the reality will digress.

Keeping fully abreast of all project activity is vital to ensure that regardless of the gap between the original or 'baseline' plan and the reality, the objectives of the project will still be met. The plan (PID in PRINCE2, "schedule" for Lock) is a living document that is constantly updated throughout the project. This does not mean re-writes or anything so drastic but the plan must be kept up to date so objectives continue to be met. To keep plans up to date the project manager must get regular progress reports on every active task.

Lock identifies 3 general reasons for changes to project schedules:

- A change in project parameters – resources, costs, timescale suddenly changes

- A change in "network logic" – Lock refers to the actual approach to a project as the network logic, the sequence of tasks that will lead to the attainment of the objectives for the project. A change to this logic will mean the schedule needs to be updated.

- Update with progress on specific tasks, i.e. recording progress.

It is also recommended that a baseline of the originally planned schedule is saved before updates are made. This will allow the PM to compare the actual plan to the baseline as the project progresses and also once the project has been completed.

Frequency of Updates

Some managers update their plans continuously and progress information is entered directly into the computer as soon as it is known. This is not straightforward on large projects or in situations where the resource working on the task is not in a position to update the schedule. (Project support or project administrators can assist here.) A key influence here will obviously be the frequency with which management require status updates. Another influence may be the complexity of the project and therefore the level of risk associated with it. In a high risk project, it may pay off to track and report on it more frequently. That way, you have all the necessary updates coming in to the project office and you are more likely to identify potential problems before they get out of control.

It is often simpler to update schedules with all latest available information in one go, thereby keeping things consistent. Depending on the nature of the project such 'batch' updates could take place daily, weekly or monthly.

The balance between keeping the project on track and the need to allow those working on the project to concentrate on the tasks assigned to them needs to be tailored to fit.

Collecting Progress Information

Generally, the more straightforward the approach is to the collection of progress information the better. Collecting progress is more straightforward where all project team members have access to the schedule or an application that will update the schedule. Progress information collection should become a routine part of every project. Collection can be done by a number of computerised methods, some of which might be:

- Emailing in Project Schedule files (e.g. MS Project file for a sub-project)
- Emailing in Excel update sheets (perhaps a standardised project update Spreadsheet)
- Accessing the master schedule over the network and updating those files and tasks to which computer access has been granted.
- Updating the schedule though a purpose built web frontend.
- Submission of timesheets for each resource or workstream so that effort (time) updates and completion estimates (% complete) can be manually entered into the master schedule.

Use of Task Lists

As indicated above, if tasks or activities have been assigned directly it makes sense to request progress updates on a task by task basis. This may be as simple as a phone call to enquire how the far along the task is or may involve the submission of RAG status reports on a task list.

The use of "% complete" generally appears on these sorts of reports or lists, including on MS Project Gantt Charts. This is fine in terms of the duration of the task but recording a % completion rate for the task itself is a dangerous tactic for a project manager. Recording a task as 50% complete gives the reader the distinct impression that 50% remains and it will take exactly the same amount of money and time to complete the second half when this is rarely the case on projects. You need to be certain that 50% of the time allocated actually translates to delivery of 50% completion status (i.e. efficiency of the resource completing the task in question). We'll look at this in a later session in terms of Earned Value calculation as a schedule and cost performance measurement / tracking approach.

Time-Now Data

Lock recommends the use of the 'time-now' data approach. This basically means asking all those reporting progress to mark all tasks against one date i.e. status as at reporting date – usually the day that all progress updates take place. If you don't do this, people may report status against a variety of as-at dates and this will distort the accuracy of your reporting.

Lock's recommended content:

1. For every task which should start on or before time-now:
    - ➢ Has the task started (or will it start by time-now)?
    - ➢ If not, why not?
    Plus a typed report of any difficulties or problems

2. For every task in progress at time-now:
    - ➢ Its expected finish date or
    - ➢ duration remaining or
    - ➢ percentage completed
    Plus a types report of any difficulties or problems

3. For every task that should have finished since the last check:
    - ➢ Has it been finished?
    - ➢ If not, why not?
    - ➢ If it has been finished, can the following tasks start? (network logic check)

4. For every task running late:
    - ➢ How much float remains?
    - ➢ How much of that is free float?
    - ➢ What action needs to be taken?
    - ➢ What action *is* being taken?

Typically, all of the above reports can be generated from within the Project Management Software – rearing in mind the old adage "garbage in – garbage out" your reports should provide up to date and timely information on project status and issues arising.

Statistical Checks
Many PM computer applications offer sophisticated functions that will churn the available data in the schedule or plan and provide figures and graphs etc. The following are two simple checks that can be of great assistance when reviewing a schedule without the benefit of these applications:

- How many people should be working on this project (or task) today?

- How many people actually *are* working on this project (or task) at this moment?

Multi-Project Schedules
Previously, we noted the distinction between individual projects, portfolios of projects and programmes. It is in the planning and the control of multiple projects that project portfolio management applications really come into their own. Enterprise project management systems allow project files and data to be collaboratively shared and accessed across countries, organisations, divisions, departments and teams etc.

Some of the key characteristics that multi-project PM applications need to consider are, for example:

The need for Unique Task (Activity) Identifiers
Consistency of coding in activity records and updates across multiple projects is essential. Task similarities between projects (e.g. tasks in two related projects with the same task descriptor / name) can lead to problems and confusion. Unique identifier codes on tasks or activities are essential so that all the tasks can remain within their own parent projects from an ownership & reporting perspective, at any rate. These codes also allow the project management organisation to "slice & dice" the project tasks and related task attributes & information. Reports, filters and status updates etc. can be devised to show progress from a variety of viewpoints.

"Dice & slice" capabilities can be an important component of stakeholder management, communications and reporting processes with a multi-project programme of works. Some applications will allow automatic inclusion of a Project identifier as part of each project task. They will automatically assign a project identifier tag to all tasks e.g. TaskID = "PE0814_Tnnnn" (Type=**P**roject, Owner = **E**ngineering, Year = 2008, Engineering Project # = 14, Tnnnn = Task number within that project). Applications that can do this will have been designed to work in a multi-project or distributed project environment. With others, you may have to add these identifiers in manually e.g. use a custom text field to enter the project Identifier for the task.

Primavera and MS Project Server support this collaborative work approach. The benefit of multi-project, multi location PM systems is that they can be configured to support calendars across International boundaries. This allows work to be passed along an organisation so that while one time zone sleeps, another continues on with the project etc. Another dimension to the international systems is the fact that it allows the sponsoring organisation to avail of lower labour costs in some areas and increased technical expertise in others.

Managing the Multi-project Model
- Discipline is the key to managing multiple projects plans and schedules. Consistency in the addition of data (project, resource, activity) is required.
- You need to document and / or configure your task naming conventions, activity types, resource pools, reporting filters, views and templates etc. so that only official standards can

be used. Allowing people to develop their own "ways of doing things" can lead to misinterpretation of meaning across project groups and teams.

- Only skilled, appropriately trained people should be allowed (have access) to update.

Data Preparation
- Individual projects require individual schedules or plans. These need to be comparable and need to be compatible with the PMO or Master project planning system. Some of the more popular high-end systems will support import of project schedules and plans from multiple other vendors e.g. Primavera will read in an Excel file (providing it has been properly formatted) or an MS Project file and incorporate it into the existing project or programme schedule (often with assistance from a schedule resource in the PMO).

- Resource Definitions - resource data needs to be recorded with the full portfolio of projects in mind.
  - ➢ Non-project or 'line' / overhead / administration work needs to be taken into account – since it will ultimately be charged against the project budget.
  - ➢ A resource pool can be defined by the project organisation. Charge rates (standard, overtime, holidays, callout charge etc.) can be attached to the resource.
  - ➢ Calendars can be defined for different resource types e.g. professions, geographic zones, factories, machinery etc. Resources defined in the resource pool can be attached to a calendar so that any attempt to schedule a resource outside the calendar will result in either an error or advisory message or an automatic adjustment of task end dates (or maybe a suggestion that you need to add more resources to complete the task in time).

Prioritisation across Projects
- In-house prioritisation rules need to be set before resources can be allocated to allow applications to make recommendations. This can be on a time-basis, i.e. the project with the earliest completion date is the highest priority project. It is rarely this simple however. No application can solve organisational problems related to personal preferences and office politics. The approach or methodology adopted is what matters.
- Many applications have "wizards" and "prompts" to let you know when there is a potential or actual problem in a schedule. As you become more expert with an application, you can turn these prompts off. However, they are a useful way to allow your organisational "preferences" to be reflected by the application when novice or new schedule (software) controllers are working on your projects.

Interface Activities
- Some tasks end up being listed for more than one project or activities are linked by shared constraints. It can be the case that an entire project is reliant on another project, in which case the interface activity is the final activity on that project. Equally, a deliverable from a sub-project (maybe at a sub-contractor organisation) may be on the main programme critical path. This would mean that a delay at the subcontractor could delay the critical path for the programme. Definitely one for your risk managers! Lock suggests that interface activities that are actually the same task should have the same identifier. This is however not possible on many applications. Most applications allow linkages which are easier to handle. In network diagrams (AOA or AON) dependencies across projects are often indicated by "dummy" activities – these allow the external dependency to be represented graphically and maintain the "logic" of the overall programme network.

Updating Intervals

- As each project update will need to feed to the portfolio schedule, the more frequent the updates the better. Some planners recommend that you do not allow the software system to automatically update the schedule as it can cause changes and errors to go unchallenged or unnoticed. Generally speaking it is probably best to enter your updates and then manually (i.e. press a button or run a command) get the application to re-calculate the schedule, based on your task updates.

What If testing?
- Project management applications generally include a function that allows 'what if' comparisons. New projects can be slotted in at a high level and the impact on resources fed back or priorities can be changed to see the impact on resources or timescales.

Bibliography and Further Reading
- Project Management, 9th Edition – Denis Lock (Gower).
- Guide to the Project Management Body of Knowledge (PMBOK), 4th edition, PMI.
- Managing Successful Project with PRINCE2, OGC 2005.
- Brilliant Project Management – Barker & Cole (Prentice-Hall)
- Dynamic Scheduling with Microsoft Office Project 2007 by Rodolfo Ambriz (J.Ross / International Institute for Learning,) ISBN: 978-1-932159-87-5

Websites
- www.prince-officialsite.com – PRINCE2 website
- www.pmi.org – Project Management Institute
- www.ipma.ch – International Project Management Association
- www.esi-intl.co.uk/PM9/ – support materials for Lock