



Software Project Management

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Resource Allocation cont ...



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Counting the Cost

- So far we have concentrated on trying to complete the project by the earliest completion date with the minimum number of staff.
- Doing this places constraints on when activities can be carried out and increases the risk of not meeting target dates.

Counting the Cost cont ...

- Alternatively, the project manager can consider using additional staff or lengthening the overall duration of the project.
- The additional costs of employing extra staff would need to be compared to the costs of delayed delivery and the increased risk of not meeting the scheduled date.

Allocation of resources to individuals

- Allocating resources and smoothing resource histograms are relatively straightforward where all resources of a given type can be considered more or less equivalent.
- When allocating labourers to activities in a large building project, we need not distinguish among individuals – they may be treated as equals so far as skills and productivity are concerned.

Allocation of resources to individuals cont ...

- This is not the case with software projects.
- Because of the nature of software development, skill and experience play a significant role in determining the time taken and, potentially, quality of the final product.
- Usually, the project manager should allocate individual members of staff to activities, as early as possible.

Factors affecting allocation of individuals to tasks

In allocating individuals to tasks, the following factors need to be taken into account.

- **Availability:** Project manager needs to know whether a particular individual will be available when required.
- **Criticality:** Allocation of more experienced personnel to activities on the critical path often helps in shortening project durations or at least reduces the risk of overrun.

Factors affecting allocation of individuals to tasks

cont...

- **Risk:** Identifying the activities posing the greatest risk, and knowing the factors influencing them, help to allocate staff. Allocating the most experienced staff to the highest-risk activities has more effect in reducing overall project uncertainties. But, more experienced staff are, usually more expensive.
- **Training:** It will benefit the organization if junior staff are allocated to non-critical activities, where there will be sufficient slack time for them to train and develop skills. There can even be direct benefits to the particular project since some costs may be allocated to the training budget.



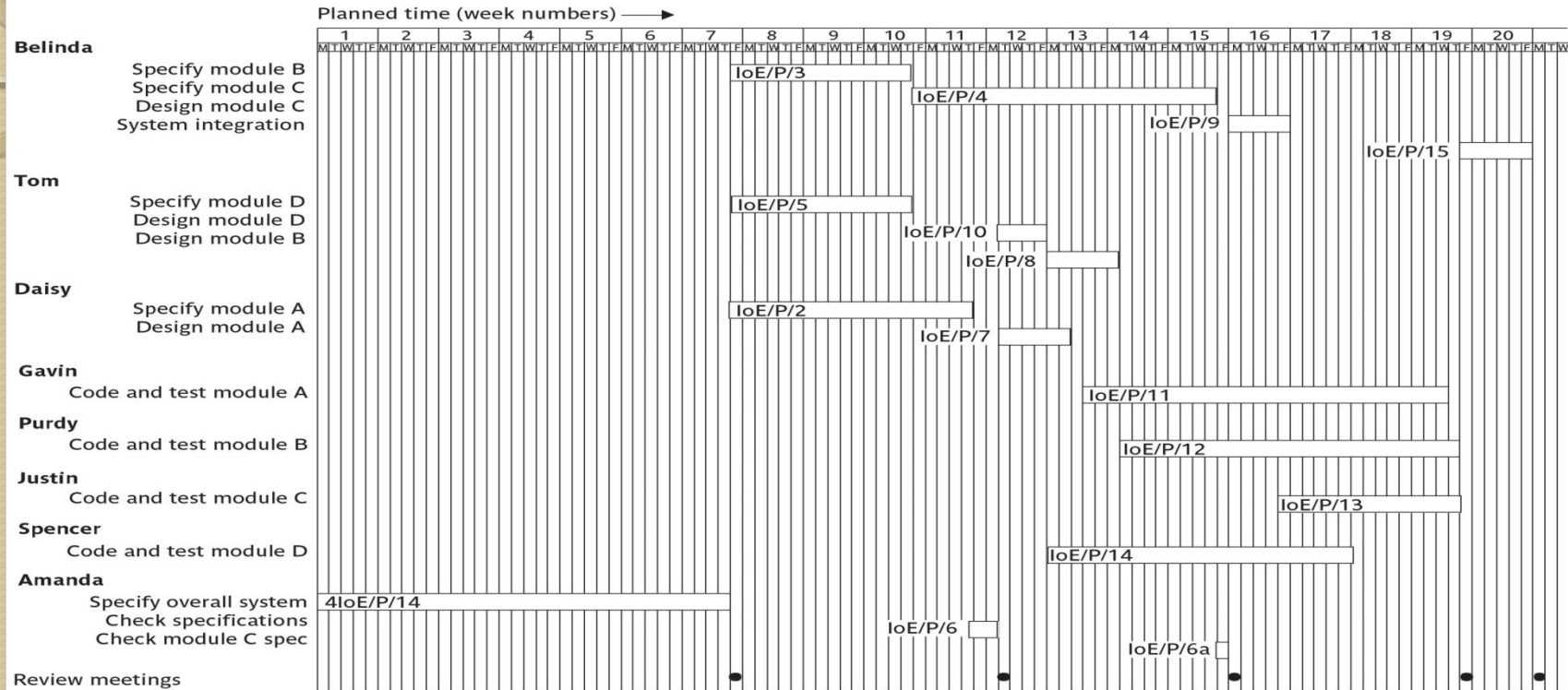
Factors affecting allocation of individuals to tasks cont...

- **Team building:** The selection of individuals must also take account of the final shape of the project team and the way they will work together (e.g. Chief programmer team or Democratic team or Mixed control team).

Publishing the Resource Schedule

- In allocating and scheduling resources we have used the activity plan (or a precedence network), activity bar charts and resource histograms.
- But, they are not the best way of publishing and communicating project schedules.
- For this we need some form of **work plan / work schedule**. Work plans are commonly published as either lists or charts such as shown in the next figure.

Work schedule



Cost Schedules

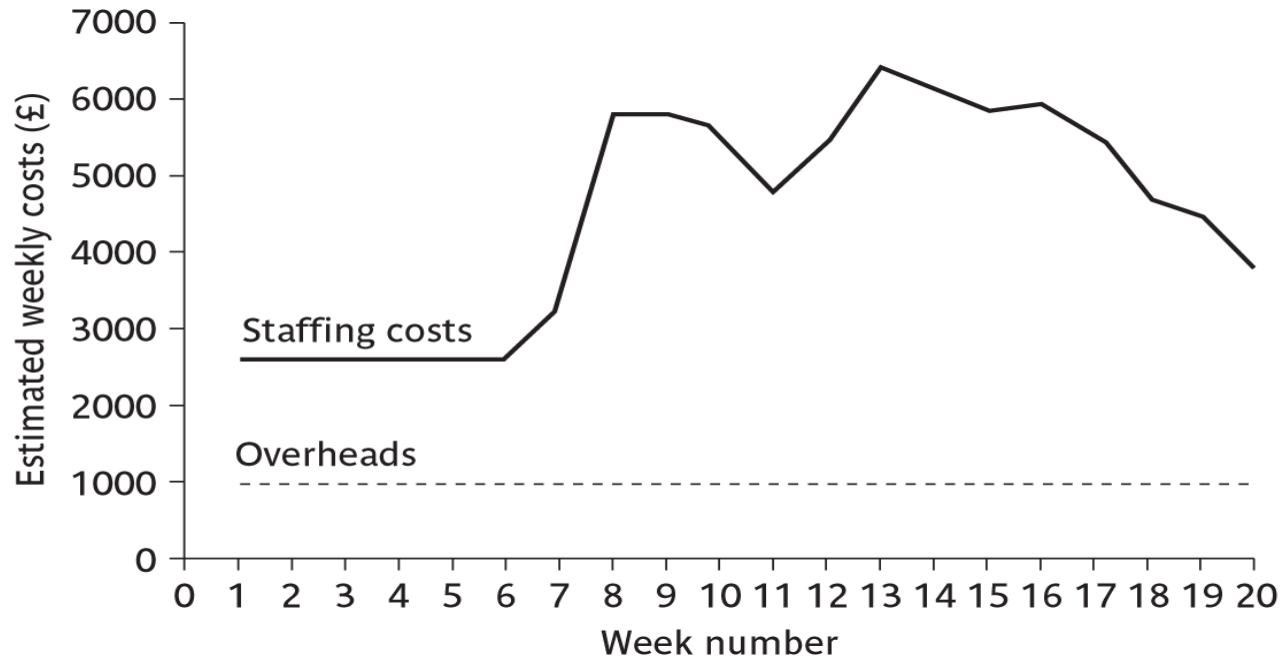
- **Cost schedule** shows the weekly or monthly costs over the life of the project. This will provide a more detailed and accurate estimate of costs and will serve as a plan against which the progress of the project can be monitored.
- Calculating cost is straightforward where the organization has standard cost figures for staff and other resources. Where this is not the case, then the project manager will have to calculate the costs.

Categories of costs

In general, costs are categorized as follows:

- **Staff costs:** These will include staff salaries as well as the other direct costs of employment such as employer's contribution to social security funds, pension scheme contributions, holiday pay & sickness benefit. These are commonly charged to projects at hourly rates based on weekly work records completed by staff.
- **Overheads:** Overheads represent expenditure that an organization incurs, which cannot be directly related to individual projects or jobs, including space rental, interest charges and the costs of service departments (such as human resources).
- **Usage charges** In some organizations, projects are charged directly for use of resources such as computer time (rather than their cost being recovered as an overhead). This will normally be on an “as used” basis.

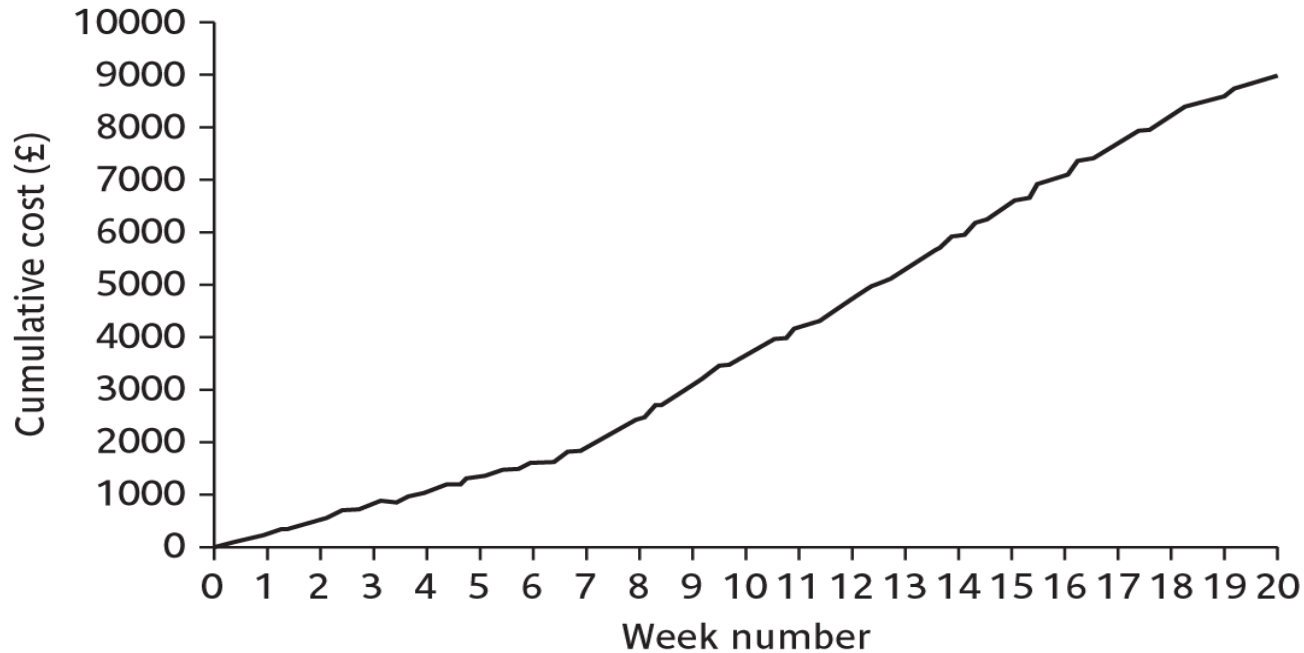
An example cost schedule



An example cost schedule cont ...

- The given figure shows the weekly costs over the 20 weeks that the project manager expects the project to take.
- This is a typical cost profile - building up slowly to a peak and then tailing off quite rapidly at the end of the project.

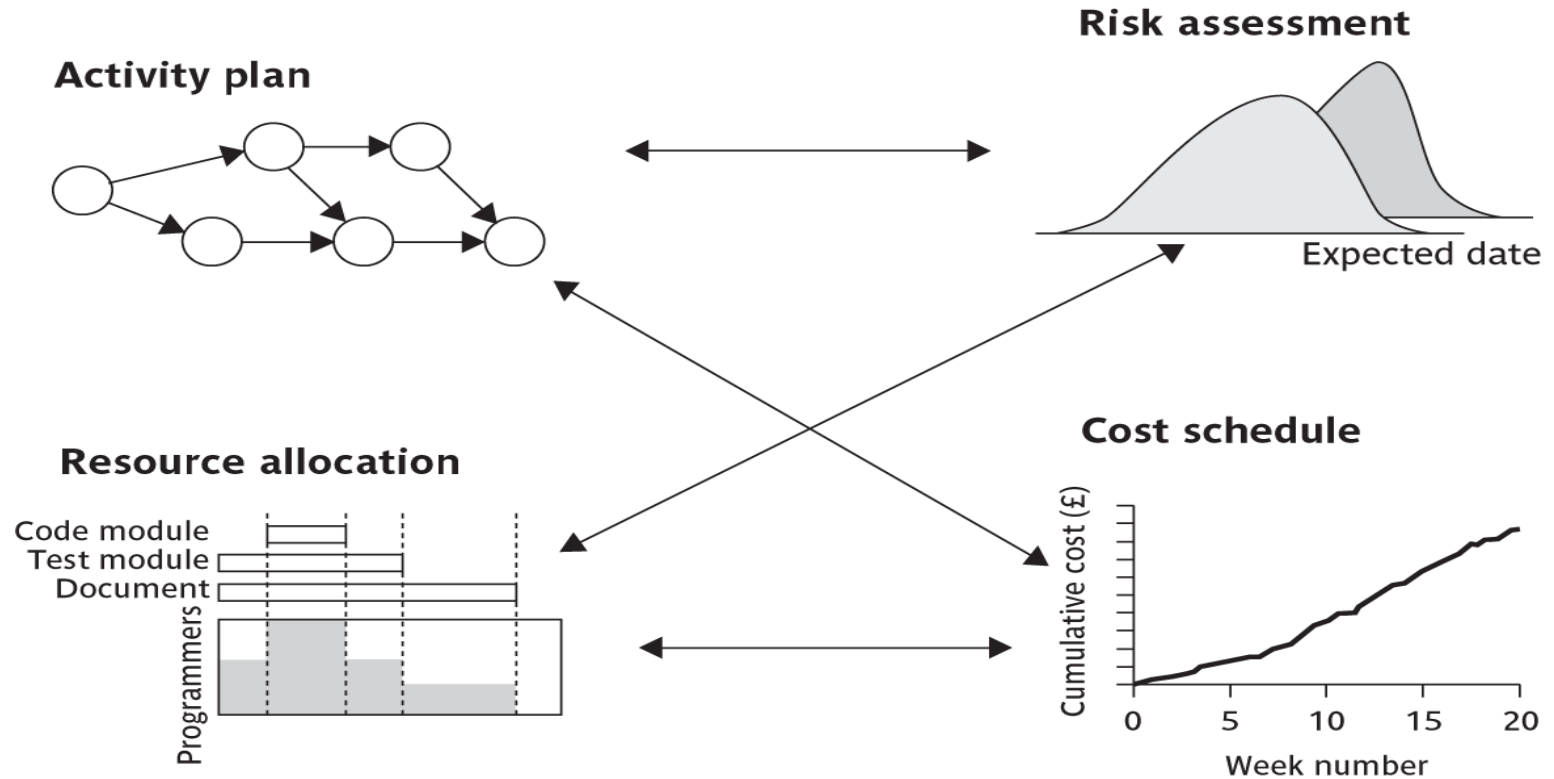
An example for cumulative project costs



Scheduling Sequence

- Going from an ideal activity plan to a cost schedule can be represented as a sequence of steps.
- Usually, the project manager should start with the activity plan and use this as the basis for the risk assessment.
- The activity plan and risk assessment would provide the basis for the resource allocation and schedule from which the project manager would produce the cost schedules.

Figure showing the scheduling sequence



Scheduling Sequence cont ...

- Usually, successful resource allocation often necessitates revisions to the activity plan, which, in turn, will affect the risk assessment.
- Similarly, the cost schedule might indicate the need to reallocate resources or revise activity plans – particularly where that schedule indicates a higher overall project cost than originally anticipated.

Scheduling Sequence cont ...

- The interplay between the plans and schedules is complex – any change to any one will affect each of the others.
- Some factors can be directly compared in terms of money, such as the cost of hiring additional staff can be balanced against the costs of delaying the project's end date. Some factors, however, are difficult to express in money terms (e.g. the cost of an increased risk) and will include an element of subjectivity.

Scheduling Sequence cont ...

- While good project planning software will assist greatly in demonstrating the consequences of change and keeping the planning synchronized,
 - successful project scheduling is largely dependent upon the **skill and experience of the project manager** in juggling the many factors involved.



Summary

- Discussed the allocation of resources to individuals and the factors to be considered during allocation.
- Presented how to publish the resource schedule using a work schedule
- Presented how to represent cost schedules
- Explained the scheduling sequence



References :

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2. J. Henry, *Software Project Management – A Real-World Guide to Success*, Pearson Education, 2004.
3. R. Mall, *Fundamentals of Software Engineering*, Fifth Edition, PHI Learning Pvt. Ltd., 2018.



Thank you