



Resource Allocation

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Introducing resources in planning

- Plans discussed so far somehow assumed that **resources were not limited** and no **constraints on their usage** are considered

Resources

A **resource** is any item or person required for the execution of the project

When considered in planning (**resource allocation**) they result in the definition of a number of scheduling:

- activity schedule
- resource schedule
- cost schedule

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Typical resources

Resources can refer to:

- **Labour** to perform project activities - full assignment vs. partial assignment to the project
- **Equipment** to be used to permit the work of labour (desks, workstations ...)
- **Materials** to be consumed during the project
- **Space** in particular if additional personnel units have to be recruited
- **Services** to be used during the project (e.g. confcall services)
- **Time**
- **Money** resource needed to retrieve other resources

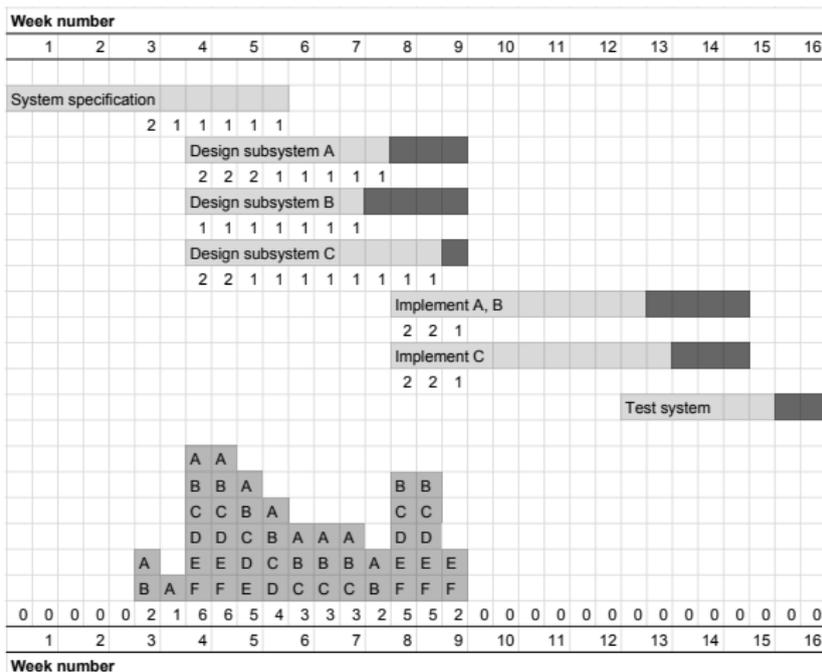
Resource requirements

To identify required resources we need to consider each single activity in the plan and define which are the needed resources

Stage	Activity	Resource	Days	Quantity	Notes
1		Project Manager	65 F/T		
	All	Workstation		17	Check for OS licenses
2	Planning	Senior Analyst	7 F/T		
...

Scheduling resources

After having identified the resources we use a bar chart to derive timewise the real needs ... we need to do it wisely



Optimisations

Finding the best allocation is difficult and time consuming

- Reduce maximum number of resource usage
- Reduce idle time for resources
- Reduce context switch for resources

Possible optimisation strategies suggest to:

- Move activities within their float
- Split activities

Additional constraints are introduced if allocation has to be based on individuals

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Allocating strategies

It is useful to **prioritize activities** so that **resources can be allocated on competing activities** in some rational order

Rule of thumb

Priority must almost always be to allocate resources to critical path activities and then to those activities that are most likely to affect others

General strategies

- **Total float priority**: activities are ordered according to their total float, those with the **smallest total float having the highest priority**. As scheduling proceeds, **activities will be delayed if resources are not available** and the total float is reduced accordingly
- **Ordered list priority**: activities that can proceed at the same time are ordered according to a set of simple criteria (e.g. Burman proposal):
 - shortest critical activity
 - critical activities
 - shortest non-critical activities
 - non-critical activity with least float
 - non-critical activity

Generation of new critical activities

Scheduling resources can create new critical paths:

- delaying an activity using all the available float
- resource allocation can transform an activity into critical as consequence of **resource release related to a critical activity**

Allocating individuals

Often individuals are **not considered the same** “as resources”. Skill and experience are generally important factors considered in resource allocation

- **Availability**: check departmental work plan and act wisely
- **Criticality**: more experienced on critical path
- **Risk**: more experienced on more complex and risky activities
- **Training**: junior staff on non critical activities permits to foresee training activities

Cost schedules

After having allocated the resources to activities and having defined a schedule it is possible to derive the **cost schedule for the project** on a weekly or monthly bases:

- Staff costs
- Overheads
- Usage charges

Scheduling decision affect cost so it can be the case that it need to be revised to optimize cost factors

Resources

Study material can be found here:



Bob Hughes and Mike Cotterell

Software Project Management, 5th Ed.

McGraw-Hill, 2009

- Chapter 7 - Resource Allocation