How to map the activity plan to available resources

- **Allocation of resources leads to**
  - Review and modify the activity plan
  - Revise stages
  - Revise project completion dates

- The result of resource allocation
  - **Activity schedule**
    - planned start and completion dates for each activity
  - **Resource schedule**
    - dates on which each resource will be required and the level of that requirement
  - **Cost schedule**
    - Planned cumulative expenditure incurred by the use of resources over time
Nature of Resources

- **Resource** – any item or person required for the execution of the project

- **Labour**
  - Members of the project team

- **Equipment**
  - Workstations and other communicating and office equipments

- **Material**
  - Items that are consumed

- **Space**
  - Office space

- **Services**
  - Some specialist services
    - telecommunicating

- **Time**
  - Offset against the other primary resources
Identifying Resource Requirements

- What resources are required along with the expected level of demand
  - Consider each activity
  - Identify required resources

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**Stage** | **Activity** | **Resource** | **Weeks** | **Quantity** | **Notes**
---|---|---|---|---|---
ALL | All | Project manager | 22 | | 
1 | All | Workstations | | 34 | Check software availability
 | A1 | Senior analyst | 7 | | 
2 | All | Workstations | 3 | | One per person essentially
 | A2 | Analyst/designer | 4 | | 
 | A3 | Analyst/designer | 3 | | 
 | A4 | Analyst/designer | 5 | | 
 | A5 | Analyst/designer | 3 | | Could use analyst/programmer
3 | All | Workstations | - | 1 | 
 | A6 | Senior analyst | 1 | | 
4 | All | Workstations | 3 | | As in stage 2
 | A7 | Analyst/designer | 1 | | 
 | A8 | Analyst/designer | 1 | | 
 | A9 | Analyst/designer | 1 | | 
 | A10 | Analyst/designer | 2 | | 
5 | All | Workstations | 4 | | One per programmer
 | All | Office space | | | If contract programmer is used
 | A11 | Programmer | 7 | | 
 | A12 | Programmer | 5 | | 
 | A13 | Programmer | 3 | | 
 | A14 | Programmer | 5 | | 
6 | All | Full system access | | | Approx. 1 week for full system test
 | A15 | Analyst/designer | 1 | |
Scheduling Resources

• Allocating resources for one activity limits flexibility for resource allocation and scheduling of other activities

• **Prioritise resource allocation**
  – **Total float priority**
    • Activities are ordered according to their total float
      – Those with the smallest float are assigned the highest priority
  
  – **Ordered list priority**
    • Ordered according to predefined criteria
      – Shortest critical path
      – Critical activities
      – Shortest non-critical activity
      – Non-critical activity with least float
      – Non-critical activities

Scheduling Resources

• Map on activity plan to assess the distribution of resources required over the duration of the project
  
  – Recruiting staff has cost
Scheduling Resources

- Map on activity plan to assess the distribution of resources required over the duration of the project
  - Recruiting staff has cost
  - Smooth the histogram by delaying the start of some activities

Creating Critical Paths

- Scheduling resources can create new critical paths
  - Delaying the start of an activity because of lack of resources will cause that activity become critical if this uses up its float
Creating Critical Paths

• Scheduling resources can create new critical paths
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Being Specific

• When allocating labourers to activities we need to be specific among individuals
  – Nature of software development
  – Skill and experience influence
    • time taken
    • quality of the product

• Availability
  – Is she available when required
  – Department work plans

• Criticality
  – Allocation of experienced personnel to activities on the critical path

• Risk
  – Allocating experienced staff could contribute in reduce of project uncertainties

• Training
  – Junior staff to non-critical activities
    • Train and develop their skills

• Team building
Publishing Resource Schedule

- **What are the risks of this allocation of resources?**
  - There are no public holidays or non-productive periods during 100 days of the project
  - None of the team has holidays for the period
  - No explicit allocation for staff taking sick leave

Cost Schedules

- Calculating cost is straightforward where organisation has standard cost figures for staff and other resources
- If not
  - **Staff cost**
    - Salaries, employers contribution to social security, pension, holiday pay, sickness benefit
    - Contract staff is charged by the week/month
      - Even if they are idle
  - **Overheads**
    - Expenditures that organisation incurs: space rent, interest charges, costs of service departments
    - These can equal or even exceed the direct employment costs
  - **Usage charges**
    - Charged directly for use of resources – computer time
Scheduling Sequence

What did we learn today?

• Identifying resources is needed
• Arranging activity starts to minimize variations in resource levels over the duration of the project is necessary
• Allocating resource to completing activities in a rational order of priority is important
• Taking care in allocating the right staff to critical activities is necessary