Learning Resource
On
Software Project Management

SPM_Unit-4
Resource Allocation

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Talkflow

- Introduction to Resource Allocation
- Types of Resources
- Resource Histogram
- Resource Smoothing
- Resource clashes
- Burman’s priority list
- Resource usage
- Cost Schedule
- Balancing concerns

Introduction

- Resources are considered as the lifeline of a project.
- Resources are used to carry out the project task and they are returned to the owners when the task is either complete or the resource is currently not being used.
- **Resource Allocation** is the process of assigning and scheduling different resources to the project activities.
- ***Resource schedule*** - indicating dates when resources **needed + level of resources**

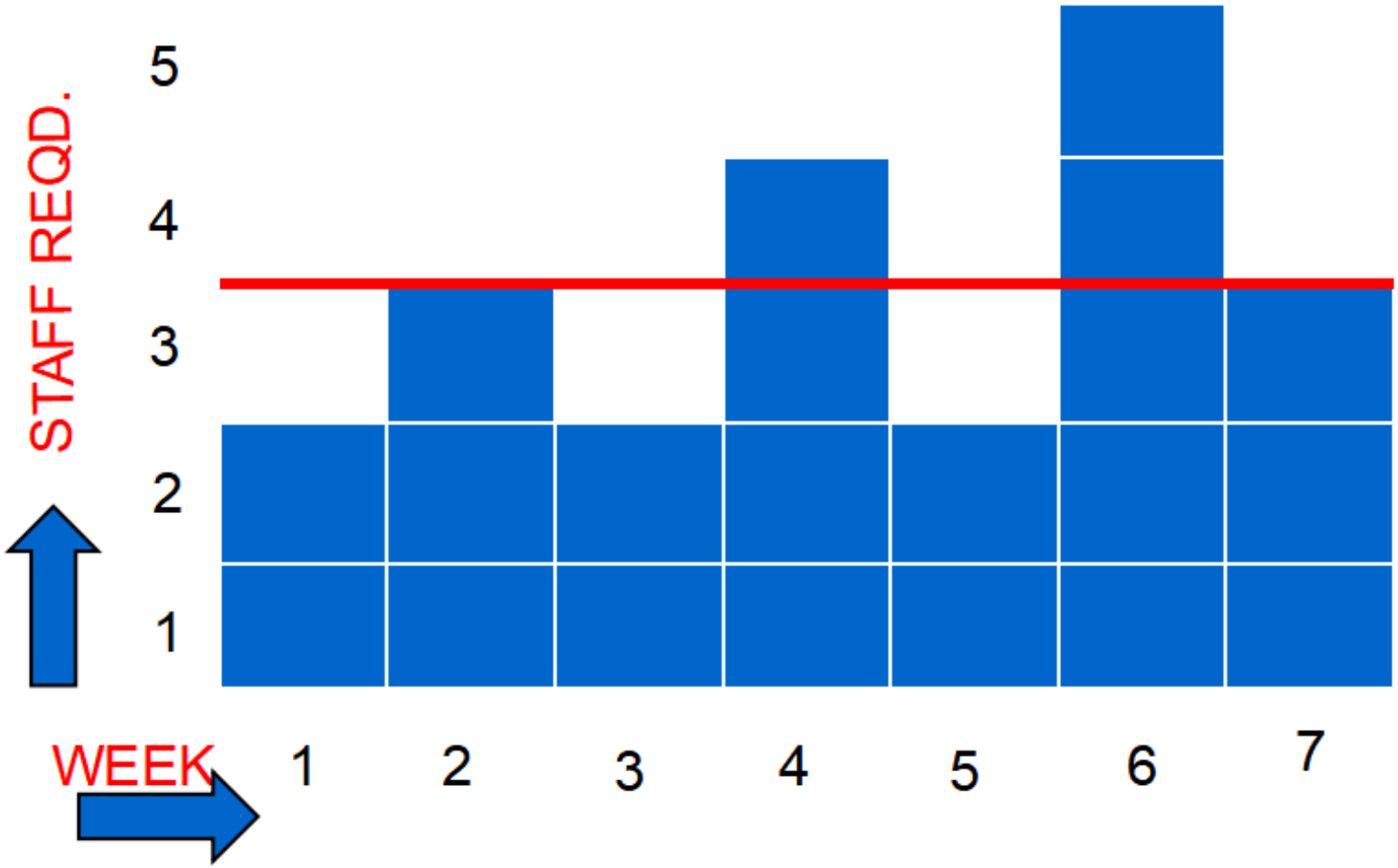
Types of Resource

- In simple terms, resources are anything that can be used to execute the project.
- These include:
  - Budget
  - People
  - Technology
  - labour
  - equipment (e.g. workstations)
  - materials
  - services
- **Time:** elapsed time can often be reduced by adding more staff.
- **Money:** used to buy the other resources

Resource Histogram

- Identify the resources needed for each activity and create a ***resource requirement list (RRL).***
- Identify ***resource types*** - individuals are interchangeable within the group (e.g. 'VB programmers' as opposed to 'software developers')
- Allocate resource types to activities and examine the ***Resource Histogram.***
- **Resource Histogram**
  - It is a bar chart that is used to display the specific amount of time that a particular resource is scheduled to work on over a predetermined and specific time period.
  - It allows a quick and single page view of availability and utilization of resources throughout the project duration.

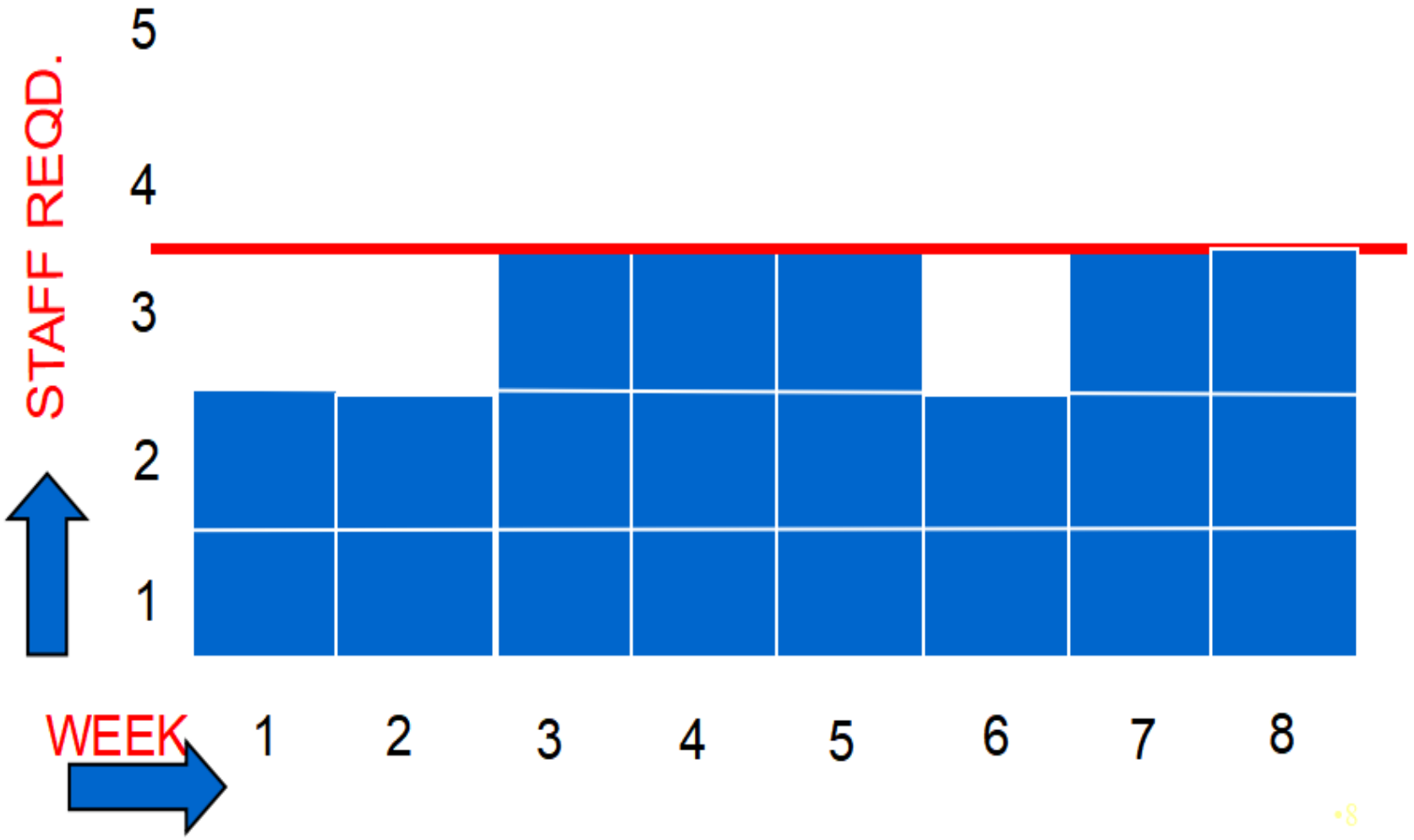
Resource histogram: systems analysts



Resource Smoothing

- It is usually difficult to get specialist staff who will work odd days to fill in gaps – need for staff to learn about application etc
- Staff often have to be employed for a continuous block of time
- Therefore desirable to employ a constant number of staff on a project – who as far as possible are fully employed
- Hence need for resource smoothing

contd..



Resource Clashes

- **Resoure clash** happens when same resource is needed in more than one place at the same time.
- can be resolved by:
  - **Delaying one of the activities**
    - taking advantage of float to change start date
    - delaying start of one activity until finish of the other activity that resource is being used on.
  - **Moving resource from a non-critical activity**
  - **Bringing in additional resource - *increases cost***
  - **Prioritizing activities:** There are two main ways of doing this:
    - ***Total float priority*** – those with the smallest float have the highest priority
    - ***Ordered list priority*** – this takes account of the duration of the activity as well as the float – see next overhead

Burman's priority list

Give **priority** to:

- Shortest critical activities
- Other critical activities
- Shortest non-critical activities
- Non-critical activities with least float
- other non-critical activities

Resource Usage

- It is suprisingly commn that a resource arrives at a project and sits idle for a long time. It should be avoided.
- We need to maximise % usage of resources i.e., **increase** the billable time and **reduce** idle periods between tasks.
- need to balance costs against early completion date.
- need to allow for contingency.
- **Utilization rate** = Number of billable hours / total number of hours.
  - **Ex:** if a resource is used for 4hrs against the possible 40hrs then the utilization rate is 4 / 40 = 0.1 or 10%. So, the project manager needs to take corrective measures to increase the utilization rate.

Critical path

- Scheduling resources can create new dependencies between activities – recall ***critical chains***.

- It is best **not to add** dependencies to the activity network to reflect resource constraints
  - Makes network very **messy.**
  - A resource constraint may disappear during the project, but link remains on network.

- Amend dates on **schedule** to reflect resource constraints

Allocating individuals to activities

- The initial ‘resource types’ for a task have to be replaced by actual individuals.

- Factors to be considered:
  - **Availability:** who is free
  - **Criticality:** more experienced
  - **Risk:** more experienced
  - **Training:** preferrably to a trained staff but can also be given to inexperienced one so that they can learn.
  - **Team building:** people who work well together.
  - **motivation:** motivated individuals