

WESTMINSTER

INTERNATIONAL UNIVERSITY IN TASHKENT

An Accredited Institution of the University of Westminster (UK)

Project Management

Lecture 8

Estimating Time and Cost

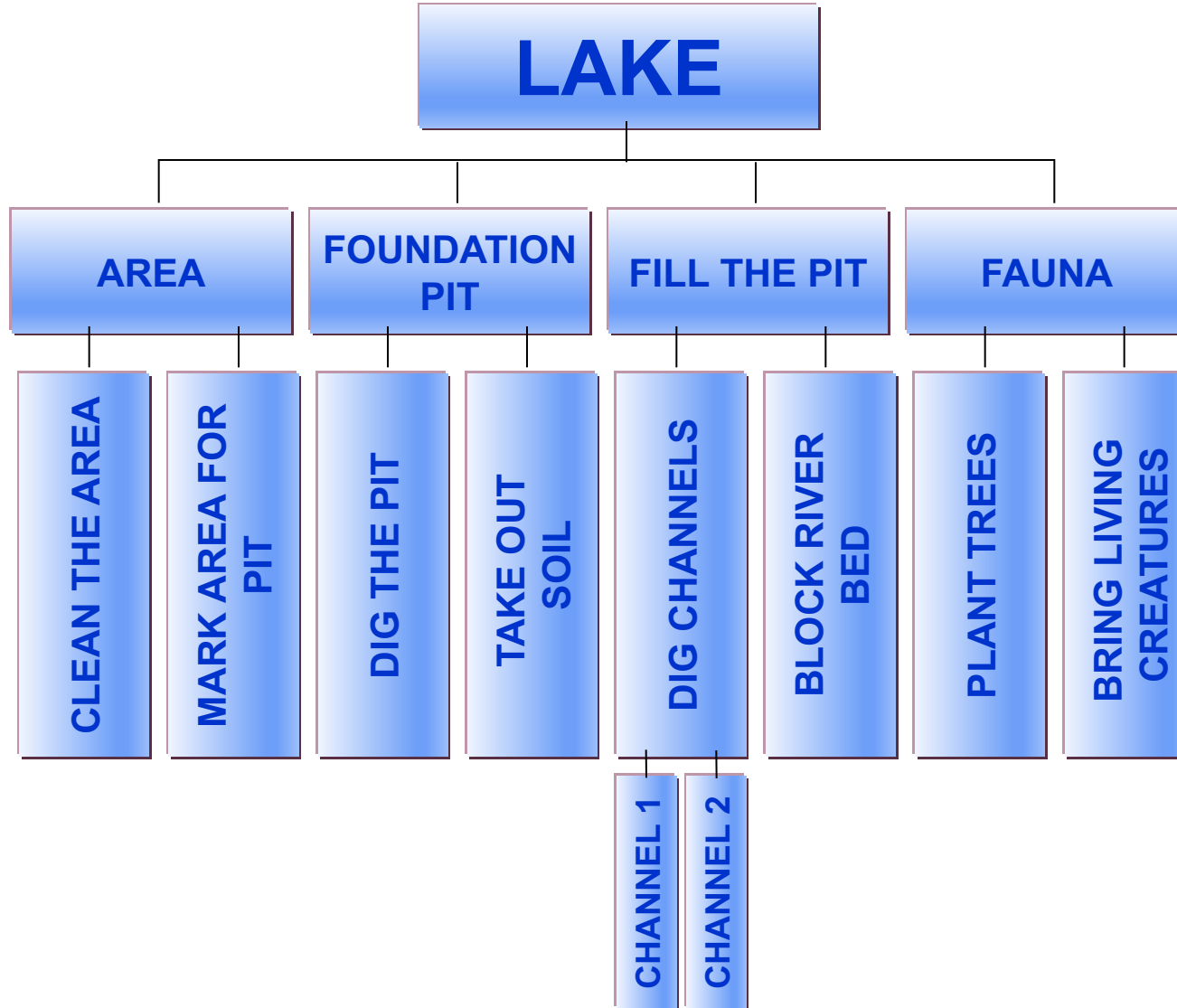
by

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Agenda

- Factors influencing Estimations
- Approaches for Project estimations
- Resource allocation

Botanical Garden



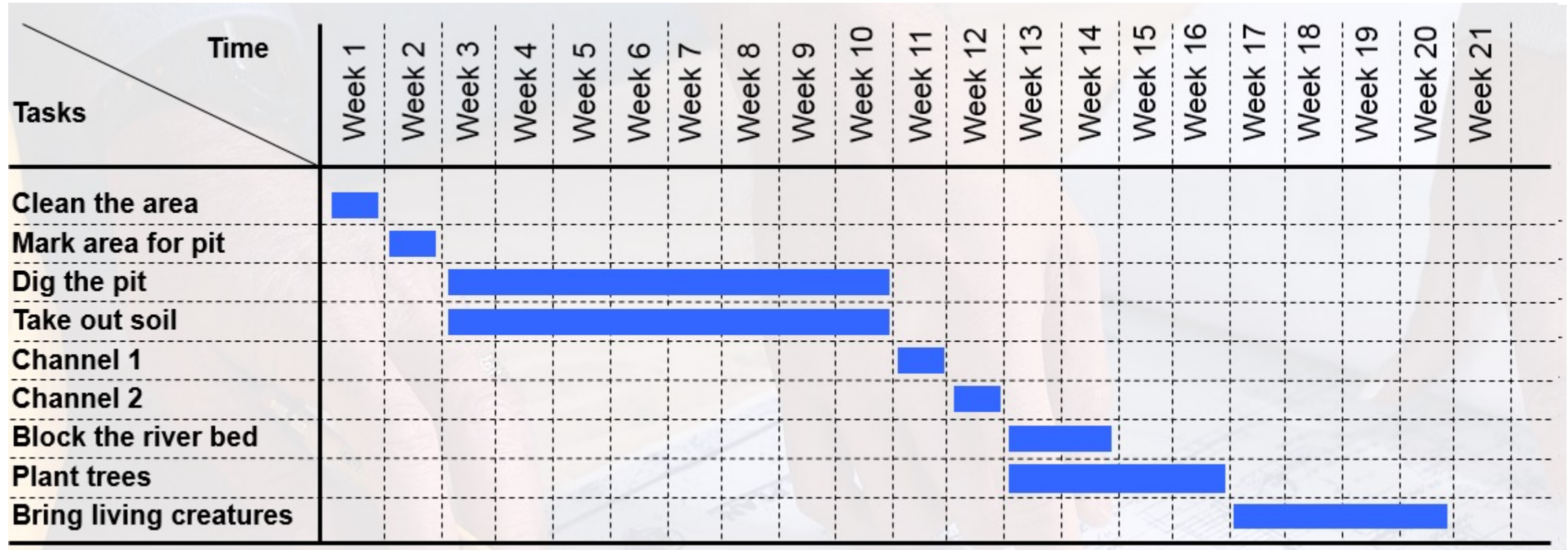
Tasks list

Tasks	Time	Time			
	Week 1	Week 2 (weeks)	Week 3	Week 4	
1.1.1.Clean the area		1	—		
1.1.2.Mark area for pit		1	—		
1.2.1.Dig the pit		8			
1.2.2.Take out soil		8			
1.3.1.1.Channel 1		1	—		
1.3.1.2.Channel 2		1			
1.3.2.Block river bed		2	—		
1.4.1.Plant trees		4			
1.4.2.Bring living creatures		4			

Tasks list

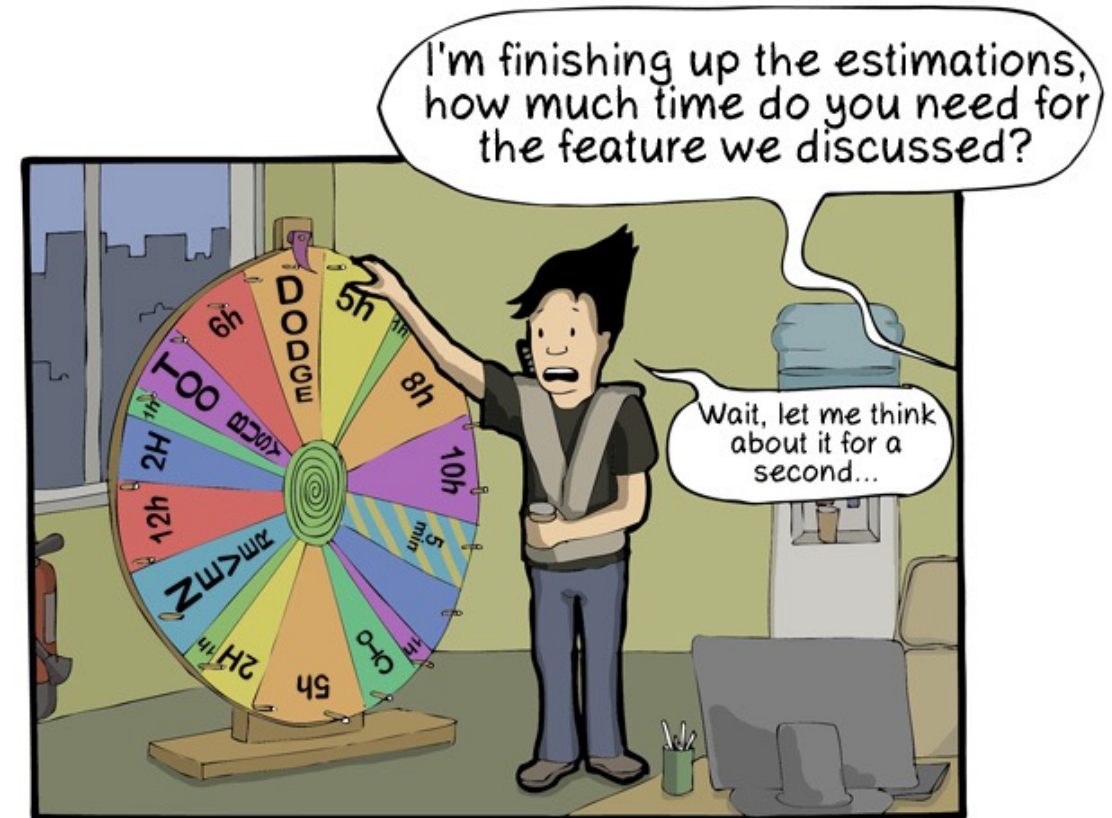
Tasks	Time	Time	Time	Time
	Week 1	Week 2 (weeks)	Preceding Week 3 task	Week 4
1.1.1.Clean the area			---	
1.1.2.Mark area for pit			1	
1.2.1.Dig the pit			2	
1.2.2.Take out soil			2	
1.3.1.1.Channel 1			3, 4	
1.3.1.2.Channel 2			5	
1.3.2.Block river bed			6	
1.4.1.Plant trees			6	
1.4.2.Bring living creatures			7, 8	

Gantt Chart



Factors influencing Estimates

- Planning horizon (we can estimate events which are close up to 100% accuracy)
- Project duration (the longer the project duration the more uncertainty in estimates)
- People (time needed to communicate in the project)
- Padding Estimates (ensuring to meet the deadline)
- Other factors – organizational culture, equipment down-time, national holidays, legal limits



CommitStrip. (2012a, April 24). *The wheel of estimation*.
<https://www.commitstrip.com/en/2012/04/24/the-wheel-of-estimation/>

- Process of **forecasting** and **approximating** the time and cost of completing project deliverables.
- Project estimation is essential for project cost control and there should be no underestimation.

WBS allows the project to be estimated at different level of details.

Basically the estimation at work package level is divided into:

- top-down estimate
- bottom-up estimate

Top-down estimate

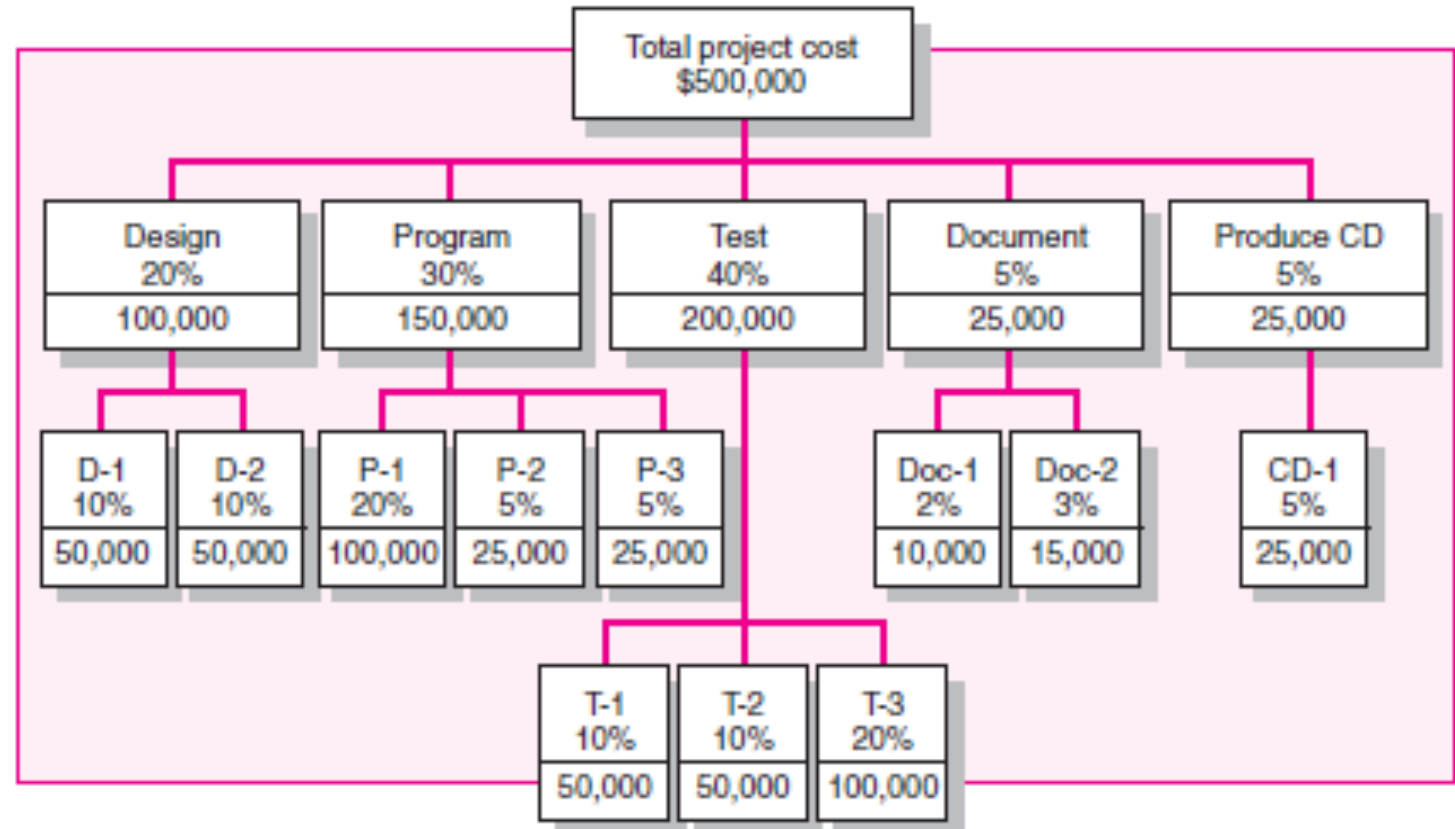
As the title suggests, the cost estimation is suggested from the higher levels down to the lower levels.

At strategic level top-down estimation is used to evaluate project proposal.

Consensus method – based on the experience of senior managers.

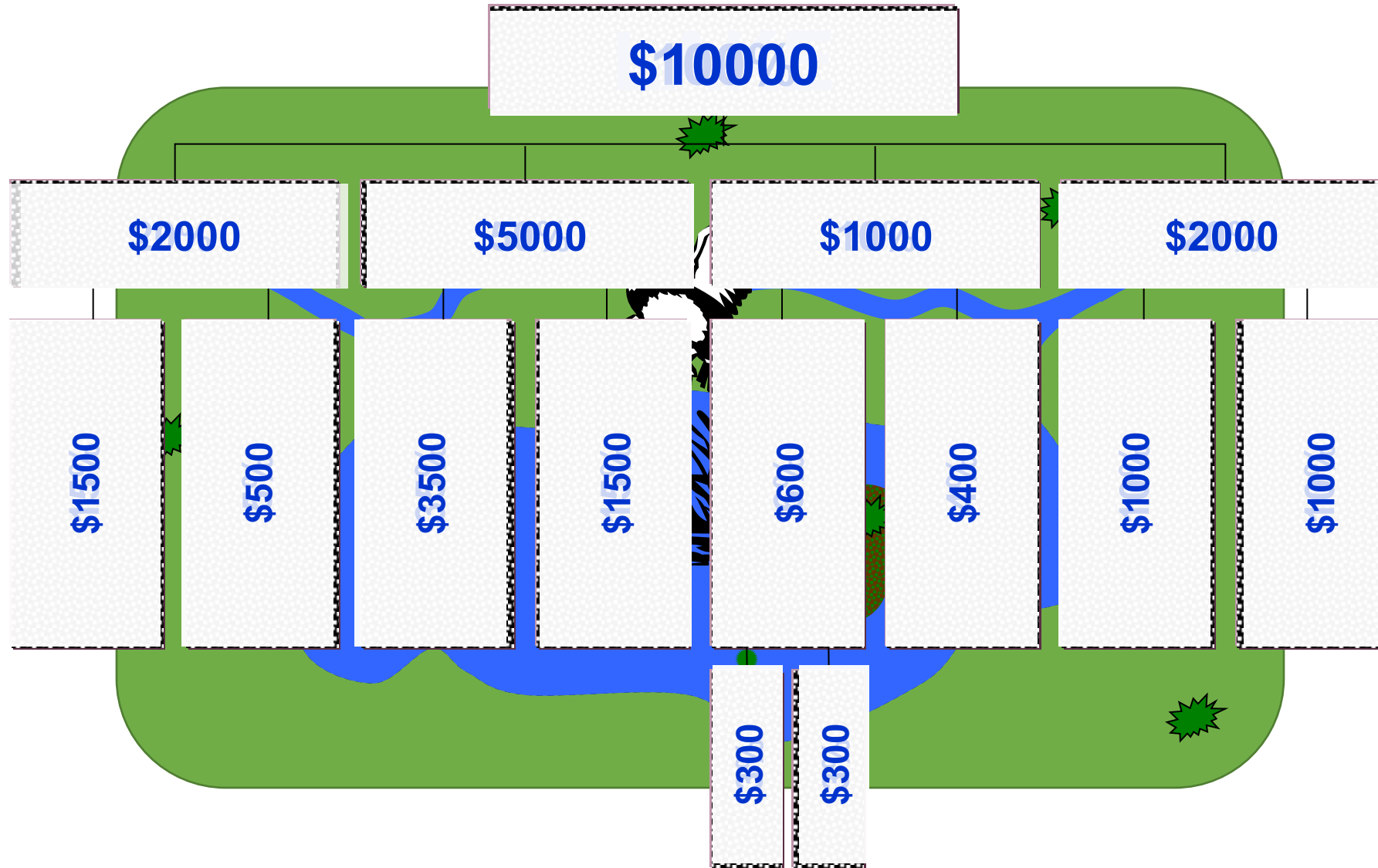
Delphi method – panel of experts to decide on the duration and costs of the project. **The voice of majority is decisive.**

Apportion Method – when projects follow features of past projects

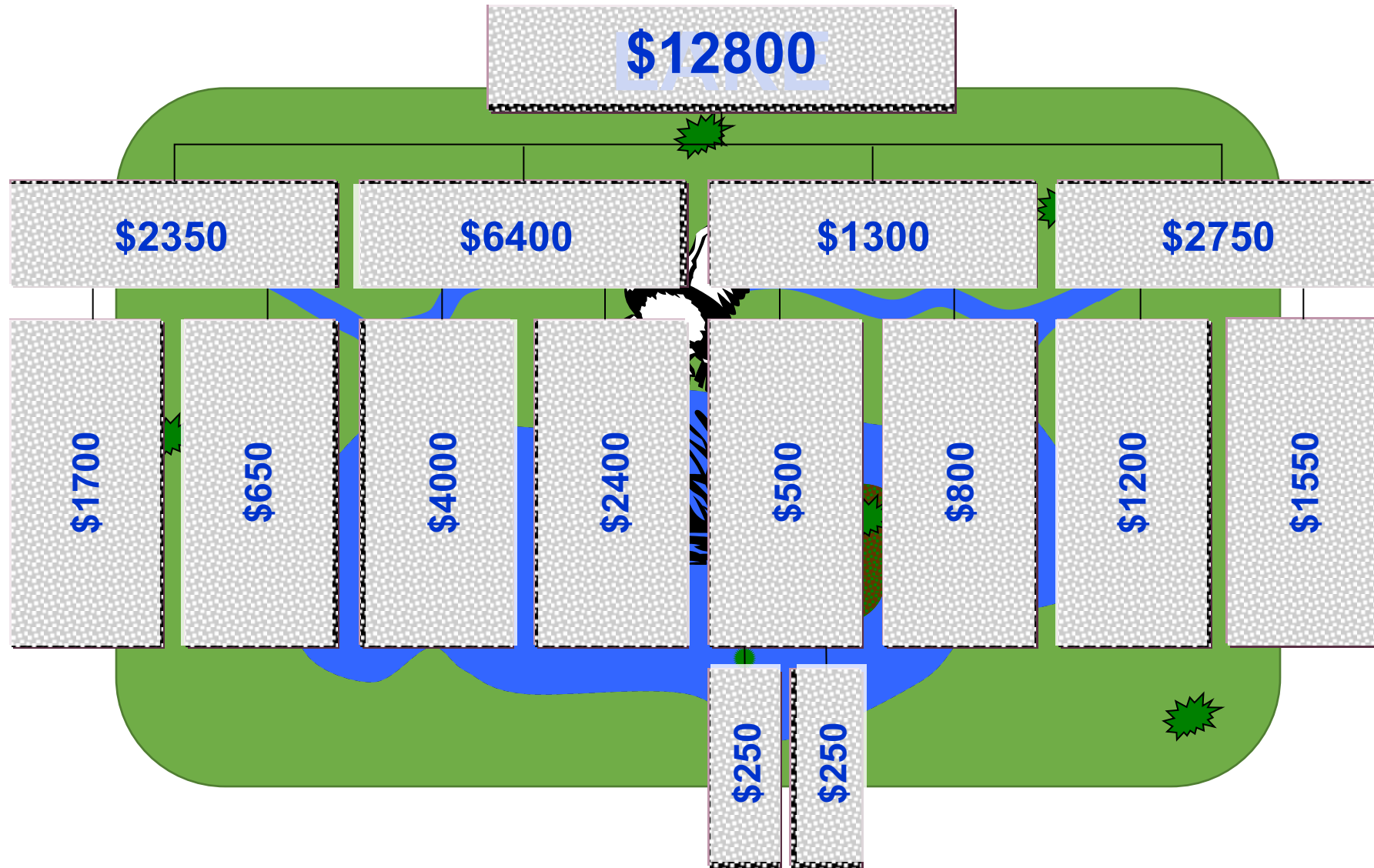


Mahajan S. (2015, December 10). *Bottom-up estimating*.
<https://iamsaurabhsite.wordpress.com/2015/12/10/bottom-up-estimating/>

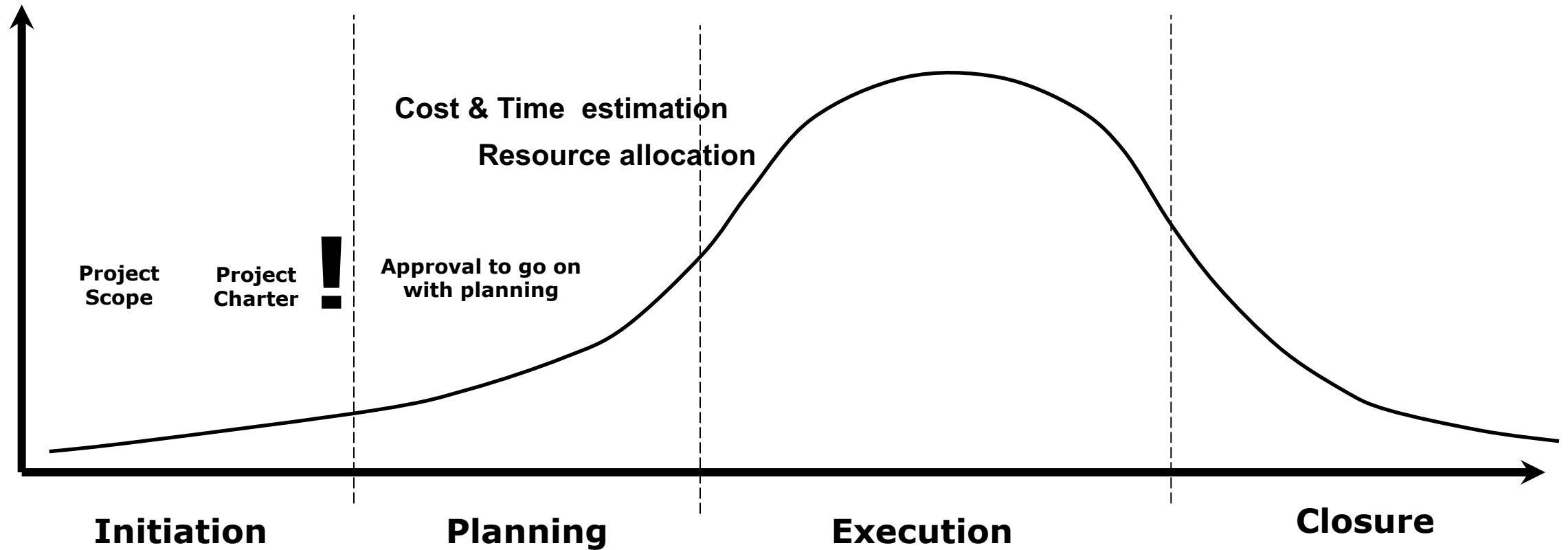
Botanical Garden Project



Botanical Garden Project



Project planning



Categories of resources

- Financial – project budget and dealing with project costs
- Human – availability and dedication (100%, 50%, 25%)
- Equipment or facilities – access to buildings, PCs and other equipment
- Consumables – normally managed through the budget; in case of rare consumables, it should be managed by PM.

Priority Matrix

This tool is helpful to identify the key criteria of the project with regard to:

Time

Cost

Performance

	Time	Performance	Cost
Constrain		●	
Enhance	●		
Accept			●

For instance, for new wireless modem development project **time to market is crucial** and PM should take every opportunity to reduce time even **compromising the budget** – which is not desirable but acceptable. Original **performance specifications cannot be compromised**.

How can we optimize time and cost?

Crashing- is injecting more cash or resources to some activities in project network diagram in order to shorten their planned durations.

There is no need to waste money by crashing all tasks as much as possible because only some need to be crashed to achieve this result, i.e. tasks on critical path (the most cost-effective).

This result gives the shortest project duration possible.

Pinto, J. K. (2007). Project management: achieving competitive advantage. Upper Saddle River, NJ, USA: Pearson/Prentice Hall 18, pages 340

Resources – Time optimization

Man days	Resource Available	Duration (days)
180	10	18
180	11	16.4
180	12	15
180	13	13.8
180	14	12.9

Duration of the task or work packages can be reduced via increase of resources dedicated for it. In turn it will lead to **increase in costs**.

1. Reducing Project Scope

- Changing scope according to constrained resources

2. Compromise Quality

- Lower the quality set before the project

3. Fast-Tracking

- Reexamine the WPs and arrange them in parallel to decrease overall duration

Pinto, J. K. (2007). Project management: achieving competitive advantage. Upper Saddle River, NJ, USA: Pearson/Prentice Hall 18, pages 342-345

- **The process of allocating tasks to resources** or conversely allocating resources to tasks.
- Resource scheduling is **trying to use resources smoothly** at a uniform rate without idle time or overloads yet with all available resources gainfully employed.

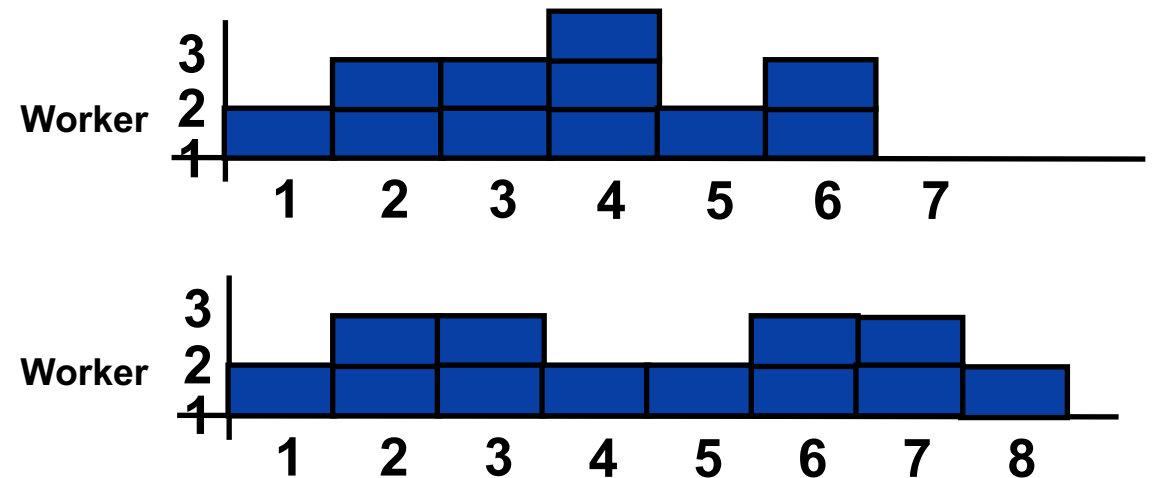
Time constrained project

- focuses on **resource utilization**. When demand for a specific resource type is unpredictable, it is difficult to manage, and utilization may be very poor.

Resource Levelling

- Technique for resolving resource conflicts by delaying noncritical tasks (using slack times).

- The main purpose of resource leveling is to create a smoother distribution of resource usage and reduce over-allocation.

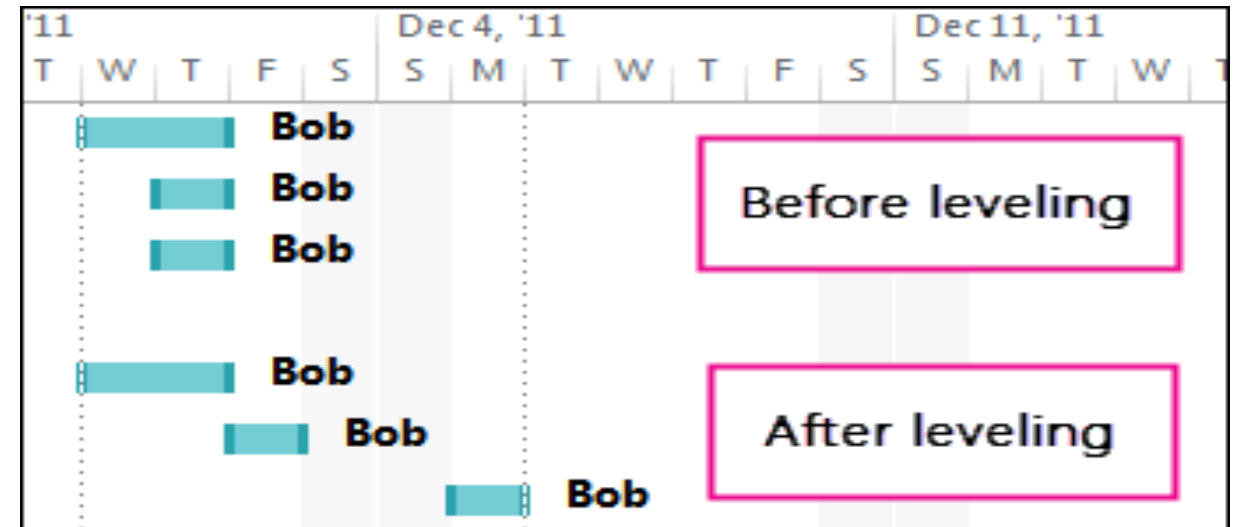


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Resource Levelling

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- The main purpose of resource leveling is to create a smoother distribution of resource usage and reduce over-allocation.



- It is a scheduling technique used to get a better schedule and/or to **increase resource utilization**.
- A planner splits the continuous work included in an activity by interrupting the work and sending the resource to another activity for a period of time and then having the resource resume work on the original activity.

MS Project Workshops Agenda

- Gantt Chart
- Dependencies
- Milestones
- Network Diagram
- Critical Paths
- Slack
- WBS Coding
- Materials
- Costs
- Human Resources
- Resource Leveling [Tutorials Online](#)



Viarami (2020) available at <https://pixabay.com/photos/tutorials-instructions-to-learn-5238355/>

Any
Questions

- Kerzner, H. (2013) Project Management: A Systems Approach to Planning, Scheduling, and Controlling, 11th edition, Wiley.
- Larson, E., & Gray, C. (2018). Project Management: The Managerial Process 7e. McGraw Hill.
- Pinto, J. K. (2007). Project management: achieving competitive advantage. Upper Saddle River, NJ, USA: Pearson/Prentice Hall.