RESOURCE LEVELING

Introduction

Resource leveling is a technique in project management that overlooks resource allocation and resolves possible conflict arising from over-allocation. When project managers undertake a project, they need to plan their resources accordingly.

This will benefit the organization without having to face conflicts and not being able to deliver on time. Resource leveling is considered one of the key elements to resource management in the organization.

An organization starts to face problems if resources are not allocated properly i.e., some resource may be over-allocated whilst others will be under-allocated. Both will bring about a financial risk to the organization.

The Two Key Elements of Resource leveling

As the main aim of resource leveling is to allocate resource efficiently, so that the project can be completed in the given time period. Hence, resource leveling can be broken down into two main areas; projects that can be completed by using up all resources, which are available and projects that can be completed with limited resources.

Projects, which use limited resources can be extended for over a period of time until the resources required are available. If then again, the number of projects that an organization undertakes exceeds the resources available, then it's wiser to postpone the project for a later date.

Structure of Resource leveling

Many organizations have a structured hierarchy of resource leveling. A work-based structure is as follows:

- Stage
- Phase
- Task/Deliverable

All of the above-mentioned layers will determine the scope of the project and find ways to organize tasks across the team. This will make it easier for the project team to complete the tasks.

In addition, depending on the three parameters above, the level of the resources required *seniority*, *experience*, *skills*, *etc.* may be different. Therefore, the resource requirement for a project is always a variable, which is corresponding to the above structure.

Establishing Dependencies

The main reason for a project manager to establish dependencies is to ensure that tasks get executed properly. By identifying correct dependencies from that of incorrect dependencies allows the project to be completed within the set timeframe.

Here are some of the constraints that a project manager will come across during the project execution cycle. The constraints a project manager will face can be categorized into three categories.

- **Mandatory -** These constraints arise due to physical limitations such as experiments.

- **Discretionary -** These are constraints based on preferences or decisions taken by teams.

- **External -** Often based on needs or desires involving a third party.

The Process of Assigning Resources

For resource leveling to take place, resources are delegated with tasks *deliverables*, which needs execution. During the starting phase of a project, idealistically the roles are assigned to resources *humanresources* at which point the resources are not identified.

Later, these roles are assigned to specific tasks, which require specialization.

Leveling of Resources

Resource leveling helps an organization to make use of the available resources to the maximum. The idea behind resource leveling is to reduce wastage of resources i.e., to stop over-allocation of resources.

Project manager will identify time that is unused by a resource and will take measures to prevent it or making an advantage out of it.

By resource conflicts, there are numerous disadvantages suffered by the organization, such as:

- Delay in certain tasks being completed

- Difficulty in assigning a different resource

- Unable to change task dependencies

- To remove certain tasks

- To add more tasks

- Overall delays and budget overruns of projects

Resource leveling Techniques

Critical path is a common type of technique used by project managers when it comes to resource leveling. The critical path represents for both the longest and shortest time duration paths in the network diagram to complete the project.

However, apart from the widely used critical path concept, project managers use fast tracking and crashing if things get out of hand.

- **Fast tracking -** This performs critical path tasks. This buys time. The prominent feature of this technique is that although the work is completed for the moment, possibility of rework is higher.

- **Crashing -** This refers to assigning resources in addition to existing resources to get work done faster, associated with additional cost such as labor, equipment, etc.

Conclusion

Resource leveling is aimed at increasing efficiency when undertaking projects by utilizing the resources available at hand. Proper resource leveling will not result in heavy expenditure.

The project manager needs to take into account several factors and identify critical to non-critical dependencies to avoid any last minute delays of the project deliverables.

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