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L & L Mitigation Aid for Effective Project Management System

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Abstract: The idea of the project management is to tackle the problems effectively and efficiently, which are faced in the construction management to optimize resources in the project and made the project successful. The construction management will identifying the lead and lagging areas in terms of time, cost, resources through the planned and performance schedule of activities during the execution of projects and the difference are monitored and controlled through project management software for completing the project successfully. The overall objective of this study is to investigate the influence of project management software technology on the well performance of construction projects. A comparison between the planned progress of construction work and actual progress is performed in this study using project management software Primavera P6, which include collecting, recording, and reporting information concerning project performance. So when the above work when integrated then there is flow of data which will help to increase efficiency and cost effective project management can be done through mitigation of leads and lags by L & L MITIGATOR tool with the help of dot NET, L & L MITIGATION AID software has the capacity to help plan, organize, and manage resource tools and develop resource estimates. Depending on the sophistication of the software, it can manage estimation and planning, scheduling, cost control and budget management, resource allocation, and documentation or administration systems. This software gives unparalleled control, monitoring, and insight to planners, project managers, schedulers, employers and any others who are involved in a given project. L & L MITIGATION AID makes the scheduling and planning process easier by allowing users access to the schedule. Additionally, you may allow workers to create their schedules within the software from any location without an internet access.

Keywords: *Lead and Lag; L & L Mitigator; dot NET*

1. Introduction

The construction industry is the largest industry in the world. It is more of a service than a manufacturing industry. Growth in this industry in fact is an indicator of the economic conditions of a country. This is because the construction industry consumes a wide employment circle of labor. While the manufacturing industry exhibit high-quality products, timelines of service delivery, reasonable cost of service, and low failure rates, the construction industry, on the other hand, is generally the opposite. Most projects exhibit cost overruns, time extensions, and conflicts among parties. In general, the construction industry is more challenging than other industries due to: its unique nature; every project is one-of a kind; many conflicting parties are involved; projects are constrained by time, money and quality and high risk.
Construction industry is important at both global and national level. It provides huge employment to the people and plays very significant role in country economy. Project is most common problem in construction industry. Project overruns due to time and cost result in delays during project execution. In developing countries project overrun is serious problem where implementation of project faces many uncertainties. It result inwastage of scare financial resource, delays in providing facilities, development and also makes construction costlier.

2. Objectives

The main objective of this study is to understand the role of project management software in a construction project. This objective was achieved through revision of literatures and methodologies involved in monitoring and control. The methodologies proved to be a guideline in understanding the progress of Construction work and also to identify the specific problems arising during the process. Also this study will help to understand different aspects of primavera p6 and the importance of project management software's in managing a construction project successfully, thus a vast and elaborate study were conducted which involves project report comparison and leveling of reports which further helps to optimize the leads and lags in project report.

Lead and lag is unavoidable parameters in a project schedule, which can arise due to various number of reasons, so mitigating of leads and lags are one of the challenging objective and motive of this project were, the project management tools play a vital role in mitigation process. With the help of project management tool L & L MITIGATOR, the identified leads and lags are mitigated throughout the project report. Results of this study show the drawbacks of the present project management system and the importance efficient planning, monitoring and Controlling, as well as the need and effectiveness of a project management software like Primavera P6 in a construction project.

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- To investigate the influence of project management software technology on the performance of construction projects.
- To compare planned and actual project report using project management software primavera p6 and to identify the leads and lags from the project report.
- To mitigate those leads and lags effectively and efficiently using L & L MITIGATOR tool with the help of dot NET.

3. Scope

Here arises the need for effective project management. Many issues are being faced by construction industry that must be taken care of. They include time and cost overruns due to inadequate project formulation, poor planning for implementation, lack of proper contract planning and management and lack of proper management during execution. It has been estimated by analysts that average cost of project goes up by 30 percentage compared to the budgeted cost. Observations show that proper skillful management is imperative for the timely completion of the project within estimated budget and with allocated resources. Projects with good planning, adequate organizational machinery and sufficient flow of resources cannot automatically achieve the desired result. There must be some warning mechanism, which can alert the organization about its possible success and failures, off and on. Project monitoring is the process of collecting, recording, and reporting information concerning project. Performance that project manager and others wish to know. Monitoring involves watching the progress of the project against time, resources and performance schedule during execution of the project and identifying lagging areas requiring timely attention and action whereas project controlling uses data from monitor activity to bring actual performance to planned performance.

4. Methodology

For this project there have chosen a reliable and innovative methods which include, selection of study area, systematic collection of data's in the form of literature papers and journals analysis and interpretation of data, identification of topic, project planning which involves adopting innovative ideas for the progress of project success, conducting detailed study on needful tools, here for example a detailed study on project management software primavera p6 have been conducted for analysis and identifying the problem which are faced by the construction industry and to tackle it a mitigation tool have been implemented as L & L MITIGATOR which increase the efficiency of project reports and to mitigate the main problem areas faced by the construction project in terms of leads and lags**.**

4.2. Proposed Methodology

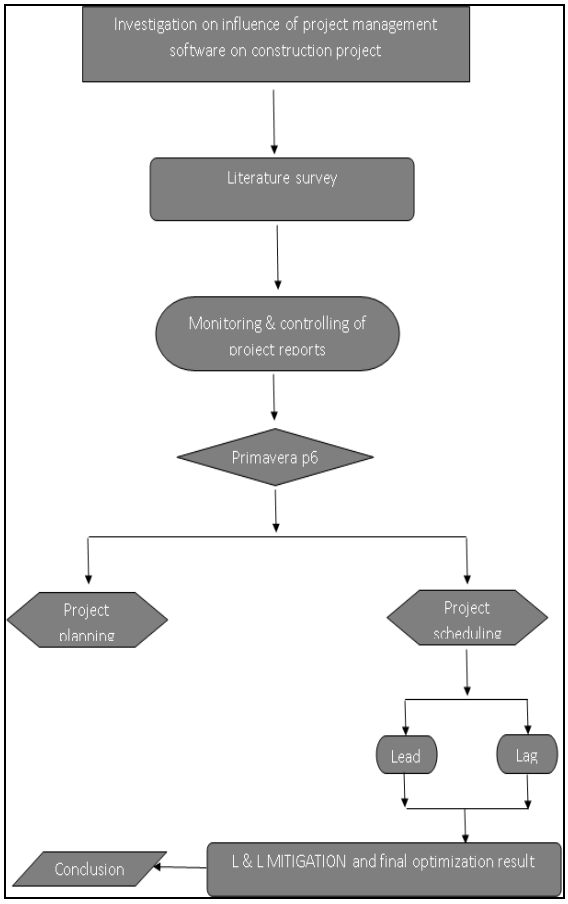

Figure 1.*Proposed methodology*

5. Project planning

Project planning is part of project management, which relates to the use of schedules such as Gantt charts to plan and subsequently report progress within the project environment. Initially, the project scope is defined and the appropriate methods for completing the project are determined. Following this step, the durations for the various tasks necessary to complete the work are listed and grouped into a work breakdown structure. Project planning is often used to organize different areas of a project, including project plans, workloads and the management of teams and individuals. The logical dependencies between tasks are defined using an activity network diagram that enables identification of the critical path. Project planning is inherently uncertain as it must be done before the project is actually started. Therefore the duration of the tasks is often estimated through a weighted average of optimistic, normal, and pessimistic cases.

The critical chain method adds "buffers" in the planning to anticipate potential delays in project execution. Float or slack time in the schedule can be calculated using project management software. Then the necessary resources can be estimated and costs for each activity can be allocated to each resource, giving the total project cost. At this stage, the project schedule may be optimized to achieve the appropriate

balance between resource usage and project duration to comply with the project objectives. Once established and agreed, the project schedule becomes what is known as the baseline schedule. Progress will be measured against the baseline schedule throughout the life of the project.

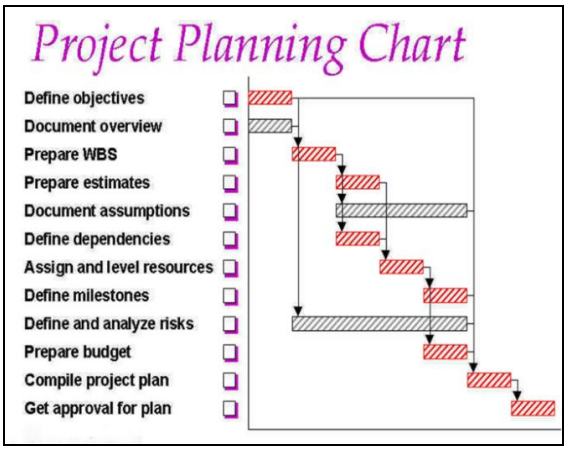

Figure 2.*Image of project planning*

6. Project schedule

In project management, a schedule is a listing of a project's milestones, activities, and deliverables, usually with intended start and finish dates. Those items are often estimated in terms of resource allocation, budget and duration, linked by dependencies and scheduled events. A schedule is commonly used in project planning and project portfolio management parts of project management. Elements on a schedule may be closely related to the work breakdown structure (WBS) terminal elements, the Statement of work, or a Contract Data Requirements List.

Before a project schedule can be created, the schedule maker should have a work breakdown structure (WBS), an effort estimate for each task, and a resource list with availability for each resource. If these components for the schedule are not available, they can be created with a consensus-driven estimation method like Wideband Delphi. The reason for this is that a schedule itself is an estimate: each date in the schedule is estimated, and if those dates do not have the buy-in of the people who are going to do the work, the schedule will be inaccurate.

6.1. Project scheduling key elements

Two project scheduling techniques will be presented, the Milestone Chart (or Gantt chart) and the Activity Network.

6.1.1 Mile stone: Milestones mark significant events in the life of a project, usually critical activities which must be achieved on time to avoid delay in the project. Milestones should be truly significant and be reasonable in terms of deadlines (avoid using intermediate stages).

Examples include:

- Installation of equipment;
- Completion of phases;
- File conversion;
- Cutover to the new system

6.1.2 Gantt chart: A Gantt chart is a horizontal bar or line chart which will commonly include the following features:

- Activities identified on the left hand side;
- Time scale is drawn on the top (or bottom) of the chart;
- A horizontal open oblong or a line is drawn against each activity indicating estimated duration;
- Dependencies between activities are shown;
- At a review point the oblongs are shaded to represent the actual time spent (an alternative is to represent actual and estimated by 2 separate lines);
- A vertical cursor (such as a transparent ruler) placed at the review point makes it possible to establish activities which are behind or ahead of schedule.

6.1.3 Activity network: The foundation of the approach came from the Special Projects Office of the US Navy in 1958. It developed a technique for evaluating the performance of large development projects, which became known as PERT - Project Evaluation and Review Technique. Other variations of the same approach are known as the critical path method (CPM) or critical path analysis (CPA). The heart of any PERT chart is a network of tasks needed to complete a project, showing the order in which the tasks need to be completed and the dependencies between them. This is represented graphically.

7. L & L Mitigation aid

L & L MITIGATION AID is a project management software program powered by DOT NET, which is designed to assist a project managers, schedulers, employers in developing a plan, assigning resources to tasks, tracking progress, managing the budget, mitigating lead and lags and analyzing workloads.

L & L MITIGATOR is a tool specifically designed to optimize and mitigate the problem area which are identified as leads and lags from project reports of any construction project.

7.1. Objectives

- L & L MITIGATION AID software has the capacity to help plan, organize, and manage resource tools and develop resource estimates.
- Depending on the sophistication of the software, it can manage estimation and planning, scheduling, cost control and budget management, resource allocation, and documentation or administration systems.

- L& L MITIGATION AID is a tool which is developed in DOT NET, which is a high performance language for technical computing, it integrates computation, visualization and programing environment.
- It is a modern programming languageenvironment .it has sophisticated data structures, contain built in editing and debugging tools, and supports object oriented programming.
- Here in this project DOT NET is performing as a prominent tool in which a program is created known as L & L MITIGATOR, which is regarded as an efficient mitigating tool for analyzing the problem areas faced by project reports and specifically leads and lags given a prior options for the mitigation and this leads and lags are resolved with alternative programs which is allotted for each days in every activities.
- Generation and modification which implies vital role in plotting of graph in accordance with comparison of various project reports which helps in analyzing the variation of graph as an optimized result to the project.
- This software gives unparalleled control, monitoring, and insight to planners, project managers, schedulers, employers and any others who are involved in a given project.
- L & L MITIGATION AID makes the scheduling and planning process easier by allowing users access to the schedule. Additionally, you may allow workers to create their schedules within the software from any location without an internet access.
- Particularly designed for mitigation of lead and lags by considering each activity and resolving the lead and lag issues by implementing alternative works for each activity in WBS, so to refer the alternative works in case of resource constraints and other probable reasons by which the work might be delayed.

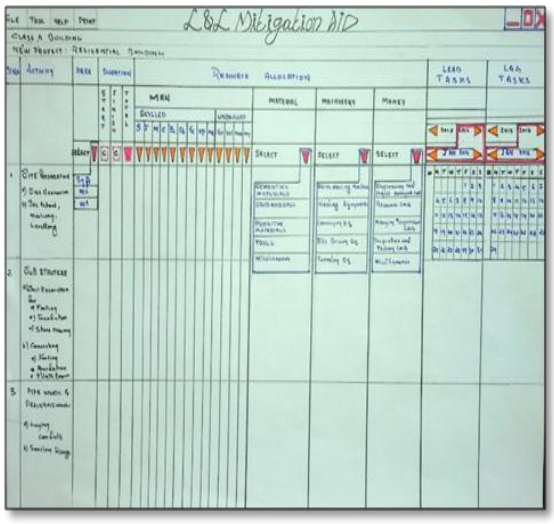

Figure 1.*Image of basic sketch of L & L MITIGATION AID software.*

Figure 4.*Image of startup page of new software in windows.*

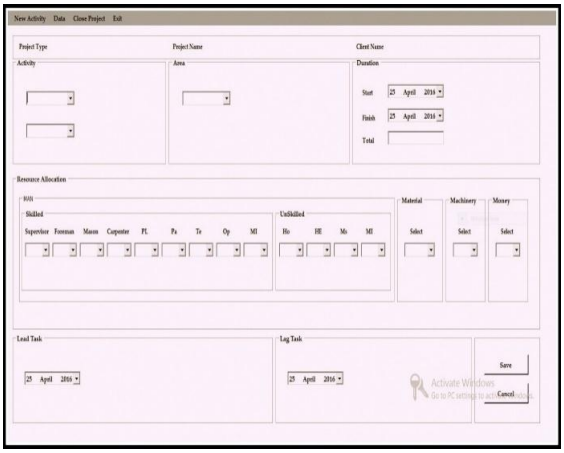

Figure 5.*Image of advanced project scheduling page in L & L MITIGATION AID software.*

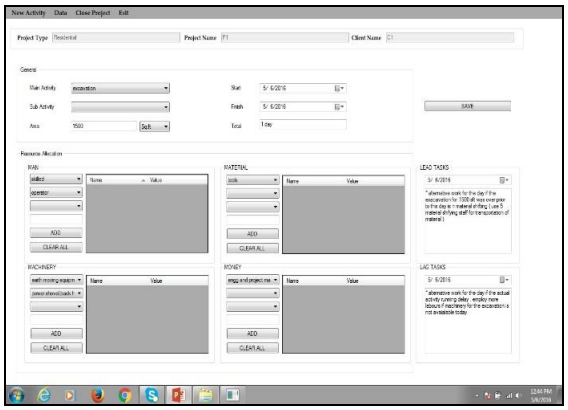

Figure 6.*Image of resource allocation and lead and lag mitigation tool features in L & L MITIGATION AID software.*

8. Conclusion

Here Project management system is directly responsible on efficient planning, monitoring and controlling of construction project with use of project management software. This study shows importance, of project management software in construction project for the success of the project.

This study helps to understand the different aspects of project management and how to use management tools effectively for the success of the project, and during the study several issues were resolved through

continues studying, monitoring and control process of various project reports with the use of project management software, similarly the leads and lags where identified and effective mitigation procedures where implemented for success of project, Thus use of such software's helps to complete the project on schedule time and cost. At the enclosure of this project following are the main results which have been regarded as effective output for the selected research topic.

(1) This research was a very important learning experience for the researcher, this research has brought in new dimensions to understanding of software development and risk management. Also, this work has helped him to appreciate the role and application of research methodology in management research.
(2) This study helps to understand the different aspects of project management and how to use management tools effectively for the success of the project, and during the study several issues were resolved through continues studying, monitoring and control process of project reports.
(3) The leads and lags where identified and effective mitigation procedures where implemented for success of project, Thus the use of L & L mitigation aid software, helps to complete the project on schedule time and cost.
(4) L & L MITIGATION AID makes the scheduling and planning process easier by allowing users access to the schedule. Additionally, you may allow workers to create their schedules within the software from any location without an internet access.

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