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Project Monitoring and Scheduling of Water Supply Project Using Primavera P6 - A Review

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ABSTRACT

Water is of fundamental importance for human life and plays an important role in many biological and chemical systems. Only 0.3% of the water resources in the world are usable.Scarcity of water has become widespread all over the world. Current methods for water scarcity assessment are mainly based on water quantity and seldom consider water quality. Population growth and urban development aspect dramatically alter natural watershed ecosystem structure and functions and stress water resources. The demand of time is review water quantity and water quality issues, as well as water supply challenges in an urban environment.So that more than a billion people in the developing world lack safe drinking water. About three billion people live without access to adequate sanitation systems necessary for reducing exposure to water-related diseases.Water is a valuable fundamental asset for life. Availability of sufficient water resource in any region effects socio economic development as well as better quality of life. Lack of water resource is determinant the poor quality of life.

In this study proposing review of literatures related to water supply system.

Keywords : Water Resource, Supply, Quality, Quantity, Satisfaction level, Primavera p6.

I. INTRODUCTION

In the developing world more than a billion people are facing a lack of safe drinking water. Approximately three billion people live without access to adequate sanitation necessary for reducing exposure to water related diseases. Poor water quality continues to be a major threat to human health. Approximate 4.1 percent of the total global burden of disease due to Diarrhea and is responsible for the 2 million people deaths of every year. Water and water resources are very important for maintaining a productive environment for all living organisms. Due to human populations and economies grow; global water demand has been increasing rapidly. Global population increase and lifestyle changes are growing pressures upon water resources leading to widespread water stress in many countries. As a result there is urgent need to conserve water for future. Actually water influence living standard as well as health status. Water is crucial substance for all living thing not only human beings, so every decision.

II. LITERATURE SURVEY

Archana Sen et.al (2022) objective of the research paper was to investigate the status of water resource and water supply system in Bhopal city in order to analyse the quantity and quality of water supply and further investigate the issues and challenges about water resource in the city. Area wise survey has been conducted with the help of a structured interview schedule along with purposive random sampling technique used here, from different areas of Bhopal city like slum and non-slum 42 sampling points are selected for primary survey. Sample size was 400, sample distributed in two major parts 144 slum and 256 non slum according to basis of slum and non slum household proportion.

The paper elucidates that water bodies are being polluted which needs great concern to its protection. The main problem found in quality of water of colour smell taste and also in the quantity of water. There should be different arrangement of sewage line so that sewage water will not enter in the freshwater body because it affects both aquatic as well as human life. As per the study the slum are suffering to much because the drainage system and water supply system are passing through the same channel in case of leakage in supply line the drainage water gets mixed and makes the water contaminated and prone to diseases. Government authority should keep eye on the status of water body so that in the future we may not made water crises.

Roma Silawat and Rajendra Chauhan (2021) research paper aimed to evaluate water quality of "Kaliyasot River '' for a period of one year 2018-19 in summer, monsoon and winter seasons. The samples were collected from different sampling points. The parameter detected were temperature, turbidity, pH, electrical conductivity, total solids, TDS, SS, nitrate, phosphate, chloride, alkalinity, total hardness Ca-H, Mg-H, DO, BOD, COD, K, Na , sulfate and fluoride all physico-chemical parameters.

The analytical result of different physico-chemical parameters stated that Kaliyasot river water was affected by various anthropogenic activities. Results concluded that the value of some parameters were beyond the permissible limit while some others were within the limit. The river is polluted but can be used for irrigation purpose.

Shivanjali Giram et.al (2021) objective of the research paper was to investigate the concept of resource management and primavera software and further conduct the case study for resource management for relative data collection, assessment of resource management by primavera software considering a case study.

Results stated that resource usage improvement was about co-relating assets, its accessibility time session and decreasing their inaction just as unwanted interest variances. Asset levelling inclination at the asset supply station by assets administrator guarantees ideal advantages. Resource redemption to multisite ventures from a solitary asset base station subsequent to leveling the consolidated interest was constantly affordable. Non Appearance of assets information and their commitment subtleties between various asset source bases will prompt asset underutilization. Resource leveling at venture place of work and sending request bundle puts imperative on best reasonable/conceivable sharing of assets among ventures. Dispensing of assets from consolidated or sole asset station per multi ventures collected and leveled request brought about 5.65% asset decrease for our situation study.

Sudarshan. S and Geena George (2021) Planning of scheduling was performed in this assessment to understand the efficiency of two different software's

Primavera P6 and MSP in construction projects. Planning, scheduling, tracking of project is completed proficiently by Primavera P6 software. Several projects of organization may be disbursed proficiently by using Primavera P6 software. In research it was acknowledged that P6 software is valuable in resource flattening and resource leveling procedures. Primavera P6 software is more effective, reduced period intense and it needs less administration than conservative methods. In this research it has provided detailed information about time management, working hour administration. Monitoring of activities which enhance success in conveying services.

The results of earned value analysis stated that the project cost is escalated because of unforeseen increase in labour and material cost. The extra cost that has incurred can be recovered within the next activities in the line by adopting the project controlling tools like fast tracking and activity duration crashing. The duration of the remaining activities is reduced by using project management techniques and rescheduling the project. Float activities to be taken care of altogether the planning activities so that work activities are completed in time. In the analysis we need to know primavera is more precise and schedules dates are reduced compared to MSP

Akhil Gupta and Dr. Sanjay Tiwari (2020) the objective of the research paper was to detaile integrated planning of the project tasks to be accomplished and developing realistic schedules. Presenting the effect of the of present progress on the project completion time and taking any corrective action required in time and investigate the effects of resource on project using PRIMAVERA software. The analysis was carried out in two phases as in phase one, collected the required data and calculated the quantities assigned in Primavera with some specific duration to the requirement of assigned activity with respect to quantity resource which were assigned to these activities and in phase two, find out the over allocation resource and resource leveling was performed.

The conclusion of research on resource used in the construction industry was to optimize or Minimize or to neglect on wastages of the resource in construction project, resource optimization has been done by using project management software of primavera P6. Hereupon optimization was done to this resource and by modifying predecessors without affecting the duration of the project. These resources were leveled in such way that their allocation is prettily within maximum probability.

Divya V S and C Gayathri (2020) objective of the research was to optimize the resources by using the methods “Resource allocation, Resource levelling, time cost trade off”. The data of twin house residential building construction was collected. Project activities are done by using critical path method and primavera software.

Results stated that the total estimated building cost was Rs. 5609600.87. The twin house building constructed schedule duration was 167 days. The critical path method and primavera was done by the duration is reduced 140 days and The project will be done by 140 days.

Hassan ElFiky et.al (2020) research paper presented a case study for applying PRs to solve the RCMPSP considering uncertainty in activity duration. A set of 17 PRs was compared to test the performance of the individual project and portfolio in terms of schedule quality and robustness. In order to identify the PR performing best, a trade-off has to be made. An evident conflict may be identified between the selected objectives as well as the viewpoints of project and portfolio managers. The presentation of results

and analysis for the specific case study for the company gives managers insights about the performance of the different PRs and allows to arrive at a compromise satisfying both objectives and viewpoints within the defined company strategy. Since, no PR is ranked best under different circumstances related to project and resource characteristics, such a case study is vital to help managers solve the RCMPSP under uncertainty inherent to the real-life cases. The applied approach is advantageous due its simplicity, low computational requirement and the application of commercial project management software.

Divya.D.S and Sahaya Nisha.J (2019) objective of the project was to optimize the resources by using the methods "Resource allocation, Resource leveling, time cost trade off". Resource allocation was used to assign available resources in an economic way. Resource allocation is the scheduling of activities and the resources required by those activities while taking into construction both the resource availability and the project time. Resource leveling aims to minimize the period variation in resource loading. Resource leveling involves redistribution and imbalance of allocated work. Resource leveling techniques were developing to enhance the shape of the resource histogram by reducing its variations. Time cost trade of was project duration can be reduced by assigning more resources to project activity. Doing this however increases project cost whereas the critical path method was used for scheduling a set of project activities. The analysis of resources also done by using primavera software.

The critical path and the building estimated total amount were determined from the above data. Then which amount of resources used for this building is calculated. Total estimated building cost is Rs. 5609600.87.The twin house building constructed schedule duration is 167 days. The critical path method and primavera is done by the duration is reduced 140 days. The project will be done by 140 days.

Kottamasu L. N. Panakala Rao and K. Shyam Chamberlin (2019) the research aimed to achieve optimum resources utilization and resource leveling and understand the importance of resource management technique using the PRIMAVERA software for Resource management.

The construction project resource allocation like labours, unskilled labours, wood worker, collaborator, watercolourist, carpenter collaborator, painter collaborator in this case revision has been optimized. In such a way that they are not over outstanding of any of the activities in the project. Resource allocation as optimised can be completed devoid of changing the project period. Resource allocation as Optimization can be done to all other resources which are used in construction projects and can reduce the project cost.

Patil C B and Arun Kumar C J (2019) objective of the research paper was to prioritize and arrange each and every activity of the project in a sequential manner with respect to the time frame and resources to complete within the specified budget. Further, identify all the risks and constraints to project workflow that may has worst effect on the whole project and schedule the project based on the planned activities along with resources requirement with a time frame so as to avoid the labor resource conflicts in later period of time & to obtain the smooth labor resource usage profiles with maximum usage & minimum wastage and to compare the project baseline schedule and total cost of labor resources both before and after the optimization of labor resources.

The initial detailed Planning helped in the preparation of Baseline Project Schedule in which Projects starts on 17 Aug 2018 and Finish on 11 Aug 2021 with the total duration of 935 Days taking into consideration field actuals, Risk factors etc., by using Primavera P6. By making workers to work 10h/d with considerations such as Labor Resource shortage, due to heavy rainfall, non-delivery of material Resources on time, due to no proper management of Labor Resources etc. that may cause Project to be Delayed, so that Project can be completed within Baseline Schedule of 935 Days. Total Cost of selected Labors Resources such as Bar-benders, Carpenters, and Masons in both before and after the Labor Resource Levelling and Labor Resource Smoothing process remained same at Rs. 2,05,43,280.

Hylton Olivieria et.al (2018) Critical Path Method (CPM), a planning and controlling technique, is widely used in the construction industry. However, CPM is criticized for its lack of workflow and inability to schedule continuous resource usage. Location-Based Management System (LBMS) fill these gaps and has been implemented in many construction projects. We propose that LBMS will improve schedules and project performance, addressing CPM's main shortcomings. This study was composed of three case studies. CPM schedules were analyzed and were improved using LBMS tools.

The resulting schedules show improved workflows, crew balancing, resource usage and had fewer interruptions, without affecting project duration. Furthermore, LBMS schedules were optimized with only a few scheduling operations and fewer planning elements. The computational benefit of LBMS increases with the number of locations and tasks in a schedule. Project managers will benefit from a simpler scheduling process and better resource flow.

Shanghong Zhang et.al (2018) research paper investigated a complex regional water resources system, the concept of a water resource treatment and distribution station (water station) was proposed. A water distribution hierarchy for the regional WSSU was constructed to clarify the relationship between supply and demand. A refined multi-source, multi-user, multi-target water resource allocation model was constructed. Tianjin's water resource allocation in the average year of 2020 was used as a case study.

The results stated that, even with adequate external water supplies, Tianjin will have water shortages. Some areas do not have a water infrastructure network connecting them to the River water transfer project. In addition, the capacity of the pipeline from the Luanhe River water to some areas is limited, which leads to water shortages caused by infrastructure limitations. Therefore, it is necessary to optimize the water supply network and increase the amount of external water in the water shortage areas. The cost of water supplies can be effectively controlled by setting a limit for River water. If the costs of water supply are sufficient, it is recommended that the water supply scheme with a minimum water shortage of 2.82 × 108 m3 be chosen to meet the water demand of the region to the maximum extent. If the costs of water supplies need to be controlled, it is suggested that a plan to meet water shortages within the range of 2.82–4.57 × 108 m3 be selected.

Kavita Dehalwar and Dr. Jagdish Singh (2016) Bhopal is in the phase of transition to becoming a metropolitan city in India due to high level of urbanization and industrialization. This rapid pace of industrialization is resulting in the high demands of water resources and enhanced level of environmental stress that further accentuates the scarcity of available resources due to high industrial and agricultural pollution. Although Bhopal has plenty of water bodies and is popularly known as 'City of Lake', but

the city's administration is getting unsuccessful in catering for the ever increasing demands of the city's population due to several reasons.

Conclusion stated that it was required to build up social capital by constructing a healthy partnership between community organizations such as Farmers Organizations (FOs), and women centered Self Help Groups for augmenting the capabilities of governance.

Aman Gaur et.al (2014) research paper conducted quality assessment of Kolar Water treatment plant. Complete data was collected and tabulated for a period of 6 months, and the performance of the plant was evaluated on the basis of the variation observed in parameters such as turbidity, alum dosage, pH, lime content. Climatic variation of the city also had a major impact on the performance of the plant. The Bhopal Kolar water treatment plant (WTP) meets the required standards set by the Bureau of Indian Standards. The data was collected for a period of six months from 1 st May 2012 to 31st October 2012 on the physical and chemical characteristics which define the quality of the raw water and filtered water of the Kolar Water Treatment Plant. In addition to that, the data was also collected on the physical and chemical characteristics which define the quality of treated water of the plant after the end of each unit process for nineteen days from 12th December 2012 to 31st December 2012.

It was found out that on an average the sedimentation tank removes 24.96% of turbidity for a period of nineteen days having a detention time of one hour and a half hour. The percentage of removal efficiency of turbidity of the water in the filtration unit is almost 100% during the study period which makes the treated water drinkable for the people due to efficient handling of equipments and careful addition of chemical dosage in the water.

Satinder Chopra and Arvind Dewangan (2014) The research dealt with discussion /introduction on Primavera P6 a project planning and scheduling tool available in the market. The quality of schedule generated from the software often lacks detail and the purpose of the software in adding value to the project is generally not met by the users in India. In addition to provide insight on various project tasks, their inter relationship, dependencies to predict total project duration during planning phase. The schedule should be comprehensive enough to let the user understand in detail the purpose of various activities in the schedule.

The result concluded that the Activity ID and Activity Description both the most unused part can greatly enhance the quality of the schedule if used properly. It was the duty of the planning team to carefully decide the Activity ID structure in advance so, that schedule preparation flows smoothly without any conflicts. Further research on how other fields like Original duration, Remaining Duration, Tasks bars in the Gantt chart, Start and Finish dates could be presented to give maximum understanding to the user for efficient schedule development.

III.CONCLUSION

The study about resource allocation, resource leveling, time and cost optimization is carried out in literature summary in section above. These are the resources are optimized by using primavera and histogram. The critical path method is done for manually and primavera software used. The project duration is reduced for using the critical path method. The many construction project the primavera software is used and this was clearly explained by the author Bhanthirithirumalesha in paper "Resource Optimization in Construction of a Residential Apartment Using Primavera P-6Software". The resource optimization is clearly studied and the

method is used the resource optimization and resource leveling. Then clearly studied the resource leveling using histogram by using crashing method for level the resources. From the various literature review is clearly stated the PRIMAVERA software used for reduce the time, cost and resources.

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