Earn Value Analysis Using Primavera for Construction Industry- A Review

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Abstract: Project cost is one of the governing factor in project success. Project management is used to increase productivity in terms of human resource and materials. Earned value management (EVM) is a project performance evaluation technique which has been adapted for application in project management. The technique helps in comparison of budgeted cost of work to actual cost. The present study deals with the review of the project management involving earned value analysis.

1. Introduction

Construction industry is an important industry at both the global level and national level. It is second largest sector in India. It provides huge employment to the people and plays very significant role in country economy. Project delay is most common problems in the construction industry. Project over runs due to time and cost result in delays during project execution. In developing countries project overruns is a serious where implementation of project faces many uncertainties. It result in wastage of scare financial resources, delays in providing facilities, development and also make construction costlier. With globalization and technology driven economic growth all over the world, a scientific and systematic approach to project management becomes imperative to ensure that project objectives are attained within the constraints of time and resources. EVM is the process of measuring performance of project work against a baseline plan. EVM application helps in providing performance standard for the evaluation of progress report of project and it also act as a control device to take care of time and cost schedule by responsibility defined in OBS. It provide better performance picture of project and gives better forecast of the final completion cost. Earned Value is an enhancement over traditional process of cost accounting. Traditionally the budgeted cost is evaluated by computing the difference between planned cost and actual cost incurred in a project. The focus was on planned expenditure and actual costs. Earned Value reveals future opportunities and it also examines actual accomplishment. With the help of EVM, project managers get sufficient help to keep deep intuitive understanding into potential risk areas. So that with the help of clearer picture of the project cost performances, managers can create risk mitigation plans based on actual cost, schedule and technical progress of the work. It is like an alarm for the managers to identify and control problems by taking timely corrective actions before they become too great to overcome. It provides better understanding of the project in terms of time and cost schedule. Earned Value Management System is a set of guidelines to provide satisfactory completion of project. It has been seen that to cover cost overrun, project team undergoes cost reduction either by reducing the project scope and quality or by providing additional. Similarly incase of time overrun, they plan crashing of activities or fast tract programs. Therefore with the use of EVM system, project goals are achieved in better way. Earned Value analysis is a method of performance measurement. Earned Value is a program management technique that uses “work in progress” to indicate what will happen to work in the future. Earned value management is system for planning and controlling the project cost performances. EVM establish work packages earned value baseline by integrating project scope, time, schedule and cost objectives. This baseline is called as cost control and is used for performance evaluation of project on a given date. Analysis of variance from the baseline provides the cost related information’s for problem identification, trend analysis and corrective actions such as re-planning and revising budget. Earned value analysis serves two main purposes. It analyses cost changes which is resulting in time and cost overrun or under-run so that timely corrective actions are taken such as modification of cash flow, updating financial forecast and project profitability expectations. Analysis of variance from the baseline using earned value management systems gives variety of variances which are analyzed to provide current status of project, to initiate corrective actions and to forecast future trends.

Primavera is software supports an enterprise project structure (EPS) with an unlimited number of projects, activities, baselines, resources, work...
breakdown structures (WBS), organizational breakdown structures (OBS), user-defined codes, and critical-path-method (CPM) scheduling and resource leveling. This makes the software relevant to be used for earn value analysis.

2. Literature Review

Ankur Verma, K.K. Pathak and R K Dixit, "Earned Value Analysis Of Construction Project At Rashtriya Sanskrit Sansthan, Bhopal", International Journal of Innovative Research in Science, Engineering and Technology, Vol.3, 4 April 2014, pp 11350-11355. Project cost is the one of the governing factor in project success. Project management is used to increase productivity in terms of human resource and materials. Earned value management (EVM) is a project performance evaluation technique which has been adapted for application in project management. The technique helps in comparison of budgeted cost of work to actual cost. The present study deals with the scheduling and project monitoring process along with it also discuss main parameter’s involves in the calculation of Earned Value Analysis in cost management of civil construction projects. Primavera P6 software is used for EVM calculations. It is concluded that use of primavera P6 software for earned value analysis calculation of projects.

Jose Angelo Valle1, Carlos Alberto And Pereira Soares, "The Use Of Earned Value Analysis (Eva) In The Cost Management Of Construction Projects” pp 1-11. The objective of this article is to present and discuss the main factors involved in the use of Earned Value Analysis (EVA) in the cost management of civil construction projects. These factors include advantages and disadvantages, difficulties and benefits, problems and solutions and criteria and results based on the experience of a real case study in Brazil. EVA was applied in the civil construction of an indoor amusement park, named Monica Park, inside the Citta America Shopping Center, in Rio de Janeiro, Brazil. The park has 30 attractions, covers an area of 10,000 square meters was built in 10 months from January to October 2000, for US$ 5 million. The case study is documented with reports, graphs, analyses and comments. A critical review of the application of EVA for the Amusement Park is provided in this paper. It shows that EVA had a relevant role in the integrated management of the project scope, time, progress, cost and risks and the procurement of the main project supplies and services. EVA contributed to the success of the case study project which finished on time and on budget. The findings of the case study will contribute to the further use of EVA on other projects in Brazil by identifying the main problems and solutions. The case study results are analysed and the article concludes with 10 recommended steps for future implementation of the EVA process.

Agata Czarnigowska, "Earned Value Method as A Tool for Project Control", BudownictwoArchitektura Vol-3, 2008, pp- 15-32. Earned Value is a well-known project management tool that uses information on cost, schedule and work performance to establish the current status of the project. By means of a few simple rates, it allows the manager to extrapolate current trends to predict their likely final effect. The method is based on a simplified model of a project, but proved to be useful in practice of cost control. It is being developed to account better for schedule and time aspects. The paper outlines the basic principles of the method and its recent extension, the Earned Schedule method, and, with help of a few examples, investigates into assumptions that affect their diagnostic and predictive accuracy.

Sagar K. Bhosekar and Gayatri Vyas, "Cost Controlling Using Earned Value Analysis in Construction Industries", 1. International Journal of Engineering and Innovative Technology (IJEIT), Vol 1, 4 April 2012, pp 324-332. Most of the construction projects suffer from cost and time overruns due to a multiplicity of factors. Earned value management (EVM) is a project performance evaluation technique that has origins in industrial engineering, but which has been adapted for application in project management. The earned value analysis gives early indications of project performance to highlight the need for eventual corrective action. This study is to present and discuss the main parameters involved in the calculation of Earned Value Analysis (EVA) in the cost management of civil construction projects. The purpose of this dissertation is in 3-fold. Firstly, Earned Value Analysis software is developed in Visual studio 2008, SQL Server 2005, .Net (C# language). Next Comparison of selected parameters between M.S Project 2007, Primavera P6 and developed software is done. Therefore, it can be concluded that the software could be used in a wide range of projects for Earned Value Analysis calculation.

Milind Padalkr and Saji Gopinath, "Earned Value Analysis in Project Management: Survey and Research Potential", Earned Value Analysis is a recommended technique for monitoring and controlling project execution. Yet, despite four decades of institutional backing and sustained advocacy, its adoption still remains limited. It draws loyal adherents as well as opponents, and an ongoing debate about its practical utility. Empirical studies of
its effectiveness or adaptation for different situations are sparse; and the claims, objections do not appear to be reconciled. In this paper, we survey academic and practitioner literature on Earned Value Management and its extensions, and attempt to reconcile the debate by juxtaposing the claims and counterclaims against parallel research streams in project management. We suggest an integrative schema to ground the technique amidst the various bodies of research opinions in order to elicit future directions.

Anuj Dubey, "Earned Value Analysis For A Construction Project" ,International Journal of Civil Engineering and Technology (IJCIET), Vol-6, 2015, pp. 53-66. Cost over-runs and time over-runs are prevalent in most of the projects carried out in developing nations such as India. There may be multiple reasons for these overruns. In order to reduce them, there should be efficient use of the construction software available in the market. This paper emphasises the use of these software to reduce these issues by the use of a scientific technique called earned value analysis. Earned Value Analysis is an industry standard method of measuring a project’s progress at any given point of time, forecasting its completion date and final cost, analysing variances in the schedule and budget as the project proceeds. It is a method for measuring project performance; it indicates how much of the budget should have been spent, in view of the amount of work done and the baseline cost for the task, assignment and resources. The analysis helps in finding out the deviations both in cost as well as in time i.e. schedule variance and cost variance. This paper emphasizes on the use of this techniques in modern software such as Microsoft Project and Oracle Primavera P6 in order to exercise better management over the project.

Dr. Arun Dhawale and Vaishnavi Tuljapurkar, "Cost Control And Tracking Of A Building By Earned Value Method", International Journal of Technical Research and Applications, vol-2, 2015, pp 15-22. Earned Value Management (EVM) is a technique that forecasts the project giving an early warning of cost & schedule. It not only measures the project performance but also measure the progress of the schedule. It is an effective tool to measure cost, schedule & performance of the project. The EVA is useful in various fields such as IT, Industries and Construction companies etc. The value of Earned Value Analysis (EVA) is dependent on two key areas i.e. Precise Cost information and pragmatic progress of project. If these two key areas are efficient then benefit of the project will definitely get valued. This paper summarizes the evolution, basic terminologies of Earned value Analysis and effective use of it in the construction industries by MS Project. There are many ways to implement EVA in the construction project. MS Project is a tool to determine the EV and its parameters in an efficient way with accuracy and within time constraints.

3. Conclusion

Here Project management system is directly responsible on efficient planning, monitoring and controlling of construction project with use of project management software Primavera P6. This study shows importance, implementation and unique features of earned value management that benefits project manager and ultimately results in project success. The companies which do not use PM software tools efficiently have to increase their investments in training and educating their employed project teams, as well as in establishing information technology systems that will support and help PM teams. The use of such software’s helps to complete the project on schedule time and cost.

4. References

