Earned Value Analysis of Residential and Commercial Building

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Abstract- *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 scheme to ground the technique amidst the various bodies of research opinions in order to elicit future directions*

I. INTRODUCTION

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 is an enhancement over traditional accounting progress measures. Traditional methods focus on planned accomplishment (expenditure) and actual costs. Earned Value goes one step further and examines actual accomplishment. This gives managers greater insight into potential risk areas. With clearer picture, managers can create risk mitigation plans based on actual cost, schedule and technical progress of the work. It is an "early warning" program/project management tool that enables managers to identify and control problems before they become insurmountable. It allows projects to be managed better – on time, on budget. Earned Value Management System is not a specific system or tool set, but rather, a set of guidelines that guide a company's management control system. In the case of cost overrun, project management team may execute a value engineering program for cost reduction either reducing scope and quality in some sections of project or providing additional budget to cover overrun cost. Similarly, for time overrun case, the may plan some program such as fast tracking or time crashing for time reduction. Therefore, the role of EVM as well as correct and on time forecasting is very important to achieve project goals. This research includes implementation and improvement on EV to achieve a forecasting EAC based on statistical and econometrics techniques and traditional EV indexes as well.

A. Earned Value Analysis –Concept

Earned Value is a program management technique that uses "work in progress" to indicate what will happen to work in the future. EVA uses cost as the common measure of project cost and schedule performance. It allows the measurement of cost in currency, hours, worker-days, or any other similar quantity that can be used as a common measurement of the values associated with project work. EVA uses the following project parameters to evaluate project performance:

- Planned Value
- Earned Value
- Actual Value.

B. Objective of study

- To study earned value analysis and its implementation in construction industry.
- To identify cases for cost overrun in all construction activities.
- To reschedule activities to lower or increase cost performance index and schedule performance index of project to avoid cost overrun
- To perform S curve analysis in given case studies

II. METHODOLOGY

Earned Value Analysis (EVA) is an industry standard method of measuring a project's progress at any given point in time, forecasting its completion date and final cost, and analyzing variances in the schedule and budget as the project proceeds.
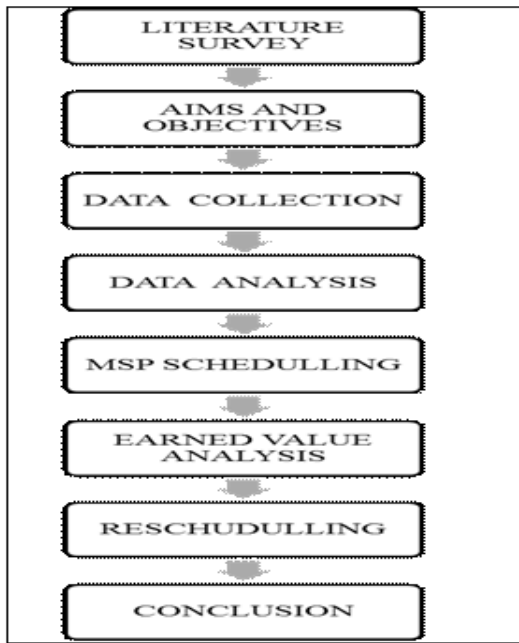
Fig 2 3rd eye view of Patil Heights
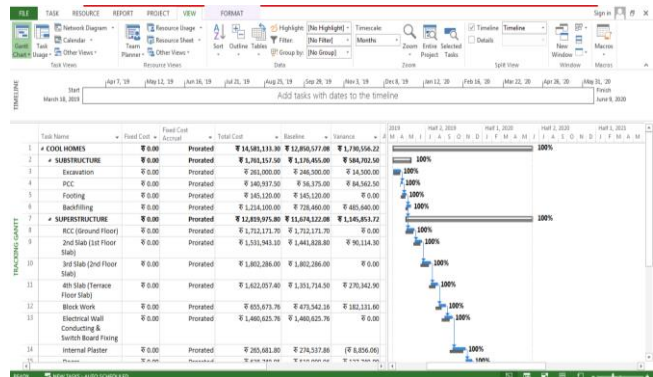
III. ANALYSIS

A. Case Study 1: Cool Homes

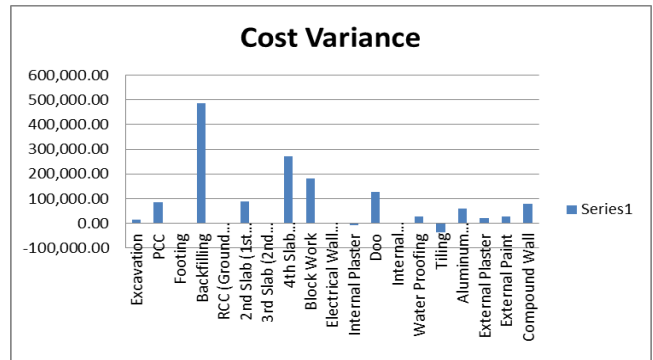Fig 3 Cost Variance of the project after updating and tracking

M.S. Project

Microsoft Project (or MSP or WinProj) is a project management software program which is designed to assist project managers in developing plans, assigning resources to tasks, tracking progress, managing budgets and analyzing workloads. The application creates critical path schedules, and critical chain and event chain methodology with third-party add-ons. Cost Variance and Schedule Variance are visualized in a Report. Microsoft Project is a project management software product, developed and sold by Microsoft. It is designed to assist a project manager in developing a plan, assigning resources to tasks, tracking progress, managing the budget, and analyzing workloads.

IV. CASE STUDY

A. Case Study 1: Cool Homes

Fig 4 Cost variance Cool Homes

Fig 1 3rd eye view of Cool Homes

B. Case Study 2: Patil Heights

Table 1: Earn value Analysis By MSP- Cool Homes

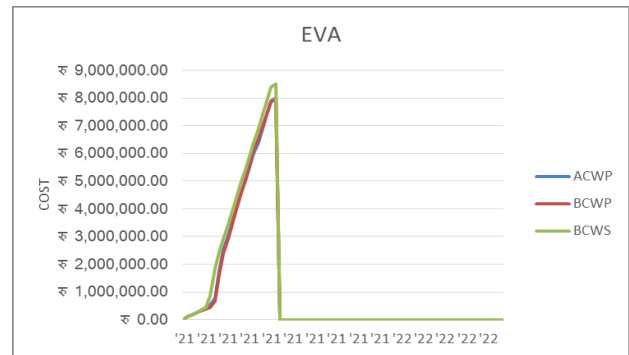| Estimate at Completion (EAC)	Actual Cost of Work Performed (ACWP)	Baseline Cost of Work Performed (BCWP)
₹14,279,050.00	₹14,279,050.00	₹12,850,577.08
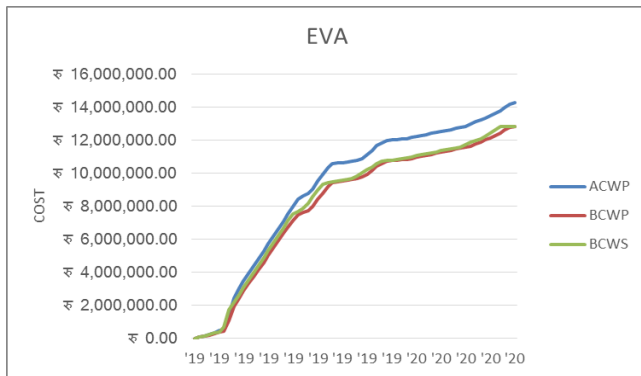
Fig 5 Earn value Analysis By MSP- Cool Homes

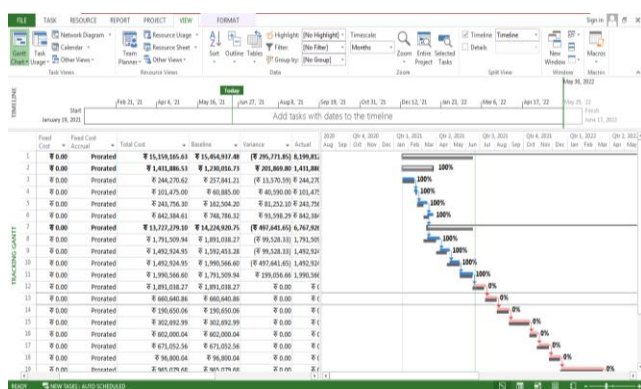## B. Case Study 2: Patil Heights

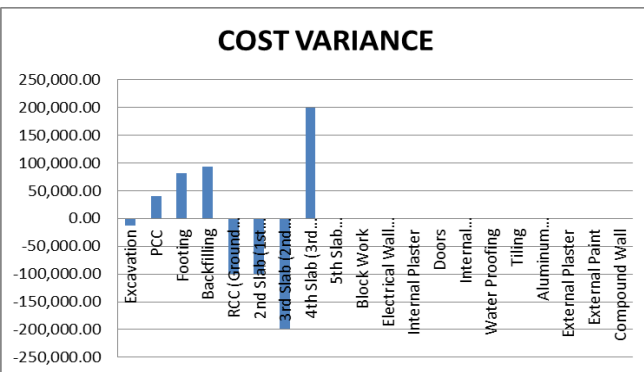Fig 6 Total Cost of the project before updating and tracking

Fig 7 Cost variance Patil Heights

Table 1: Earn value Analysis By MSP- Patil Heights

Estimate at Completion (EAC)	Actual Cost of Work Performed (ACWP)	Baseline Cost of Work Performed (BCWP)
₹ 15,526,968.05	₹8,000,756.31	₹7,963,647.37

Fig 8 Earn value Analysis By MSP- Patil Heights

IV. CONCLUSION

- 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.

- In this research work take two case studies, one project are completed name as Cool homes and one are ongoing project name as Patil Heights, the both projects are develop by Patil developers and both are located in Bhusaval.

- In The main conclusion is that EVM can provide an important contribution in cost management of a construction project, namely in the case of Cool Homes and Patil Hights-II Project.

- EVA contributed to cost management in Cool Homes and Patil Hights-II Project and the use of EVA in both Projects contributed also to the application of EVA in construction projects.

- After analyzing cool homes for earn value analysis it is conclude that budgeted amount of the project are 1.28 Cr and after tracing of the project through the duration of construction actual Cost of the project are 1.45 Cr the cost variance and earn value are 17lakhs after the completion of the project i.e the project cool homes spend 17 lakhs more than budgeted Cost.

- After analyzing and tracking the Patil Heights up to the fourth slab for earn value analysis it is conclude that budgeted amount of the project are 1.54 Cr and after tracing of the project through the duration of construction up to the 4th slab actual Cost of the project are 1.51 Cr the cost variance and earn value are 2.95 lakhs after the completion of the project i.e the project Patil Heights spend 2.95 lakhs less than budgeted Cost.

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