

Application of Earned Value Technique for a Residential Project using MSP

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Abstract— Most of the construction projects suffer from cost and time overruns due to several factors.. Earned Value is a program management technique that uses “work in progress” to indicate what will happen to work in the future. It allows projects to be managed better – on time, on budget. The earned value analysis gives early indications of project performance to highlight the need for eventual corrective action. Aim of this work is to apply EVM technique along with MSP software on a residential project to study the different activities associated with the project. The study also aims to highlights the cost and schedule analysis by using key elements of EVM and to make sure that the whole project is completed on time as per the estimated cost without any delays. To fulfill this aim, firstly the residential project has been analyzed by using analytical EVM methods. Schedule of obtained data of completed and ongoing work of the project has been prepared in MSP. Further EVM parameter has been used to obtain results. From this study, it has been observed that Project Management will be more enhanced when EVM and MSP goes hand-in-hand. This will make the project to get completed on time and will help the project practitioners to plan the work accordingly by effective scheduling, proper estimating, cost control and bring back the project to its original schedule by some alternative techniques.

Key words: Earn value method, Microsoft project, Residential Project

I. INTRODUCTION

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 overruns 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. To overcome this, effective project management comes into the picture. Project must be managed in each phase of project to avoid any delay or cost overrun.

A. Scope of Project-

The analysis of a construction project can be done by different traditional approaches like daily monitoring, weekly management reports, monthly schedules, performance reviews, key performance indicators, project audit reports etc. In traditional project management, the analysis is based on today's date and the actual amount of money spent on the project. Usually there are two data sources in such traditional approaches, the Planned expenditures (Budgeted cost of project) and the actual expenditures (Actual cost of project). The comparison of

budget versus actual cost clearly indicates what was planned to be spent on the project versus what was actually spent at any particular stage of the work. And also, how much has been produced. To measure the performance of the project at a particular date, the budgeted cost is compared to the amount of money spent. The main drawback of traditional approach is that there is no way to determine the physical amount of work performed. To overcome the drawback of traditional project management, an effect technique is considered for the analysis. The primary aim of Earned Value Management is to add he amount of actual work performed when measuring the project. The actual work performed provides more efficient output on the status of the project which helps to better forecasting and corrective actions.

B. Objectives of Project

- 1) To understand the concept of financial management in construction of building
- 2) To define work break down structure, and determine earn value management and hence calculating plan value, earn value and actual cost on specific case study.
- 3) To give result based on study if it is under or over budget.

C. Literature Gap

Previous literature briefly describes and shows that studies shows that financial management in construction study is essential while most of the work approach is on cost variance or some software approach, hence in this paper approach is to schedule the project in MSP, planning as wells as actual and analyze the data in MSP and spreadsheet as well. The formulation is done in such a manner that this method can be easily applied in any other project to determine its financial stability at any stage of project.

II. METHODOLOGY

A. Problem Statement:

To undertake Case study of live project and organize its data in MSP showing WBS, OBS, Earn Value, Plan Value and finally determine if it is going under budget or over budget.

Case Study Under taken is break down in four baselines at various stages of work and one base line study is highlighted in this paper showing at that particular what is the financial status of project.

B. EVM fields in detail:

The EVM consists of main three fields viz. Planned Value, Earned Value and Actual Cost.

1) Planned Value (PV):

Planned value (PV) is the authorized budget assigned to scheduled work. It is the authorized budget planned for the work to be accomplished for an activity or work breakdown

structure component, not including management reserve. This budget is allocated by phase over the life of the project, but at a given moment, planned value defines the physical work that should have been accomplished. The total of the PV is sometimes referred to as the performance measurement baseline (PMB). The total planned value for the project is also known as budget at completion (BAC). PV was earlier known as Budgeted Cost of Work Scheduled (BCWS).

2) *Earned value (EV):*

Earned value (EV) is a measure of work performed expressed in terms of the budget authorized for that work. It is the budget associated with the authorized work that has been completed. The EV being measured needs to be related to the PMB, and the EV measured cannot be greater than the authorized PV budget for a component. The EV is often used to calculate the percent complete of a project. Progress measurement criteria should be established for each WBS component to measure work in progress. Project managers monitor EV, both incrementally to determine current status and cumulatively to determine the long-term performance trends. EV was earlier known as Budgeted Cost for Work Performed (BCWP).

3) *Actual cost:*

Actual cost (AC) is the realized cost incurred for the work performed on an activity during a specific time period. It is the total cost incurred in accomplishing the work that the EV measured. The AC needs to correspond in definition to what was budgeted in the PV and measured in the EV. The AC will have no upper limit; whatever is spent to achieve the EV will be measured. AC was earlier known as Actual Cost for Work Performed (ACWP).

III. ANALYSIS OF CASE STUDY

Based on the methodology above the case study is carried out and outputs are drawn. Screen Shot Below showing the process of Analysis.

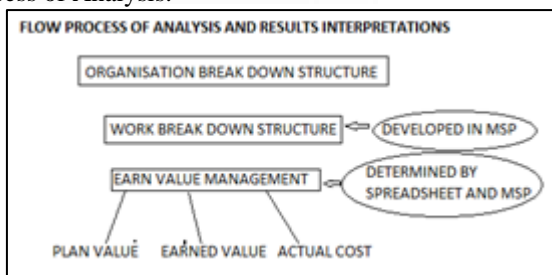


Fig. 1: Showing Process Flow of Analysis and Result Interpretations

From these values Cost analysis and Schedule analysis made. Cost Variance and Cost Performance Index are calculated from EV and AC and Schedule Variance and Schedule Performance Index are calculated from PV and EV

A. *Cost Analysis:*

The Earned Value cost analysis provides the progress of project cost-wise. The cost analysis can be summarized as follows:

1) *Cost Variance:*

The Cost Variance (CV) is the subtraction of the AC from the EV. The CV is particularly critical because it indicates the relationship of physical performance to the costs spent. Equation: $CV = EV - AC$

If Cost Variance is 0 then project or task is on budget; If Cost Variance is POSITIVE then project or task is under budget; If Cost Variance is NEGATIVE then project or task is over budget

2) *Cost Performance Index:*

Cost Performance Index (CPI) is the ratio of the Earned Value to the Actual Cost. The indices are useful for determining project status and providing a basis for estimating project cost and schedule outcome.

Equation: $CPI = EV/AC$; If CPI is ONE then project or task is on budget; If CPI is Greater than ONE the project or task is under budget; If CPI is Less than ONE the project or task is over budget

B. *Schedule Analysis:*

The Earned Value schedule analysis provides the progress of project schedule-wise. The schedule analysis can be summarized as follows:

1) *Schedule Variance (SV):*

The Schedule Variance (SV) is the subtraction of the PV from the EV. The EVM schedule variance is a useful metric in that it can indicate when a project is falling behind or is ahead of its baseline schedule. Equation: $SV = EV - PV$; If Schedule Variance is 0 then project or task is on Schedule; If Schedule Variance is POSITIVE then project or task is ahead of Schedule; If Schedule Variance is NEGATIVE then project or task is behind Schedule.

2) *Schedule Performance Index (SPI):*

Schedule Performance Index (SPI) is the ratio of the Earned Value to the Planned Value. Equation: $SPI = EV/PV$; If SPI is ONE then project or task is on Schedule; If SPI is Greater than ONE the project or task is ahead of Schedule; If SPI is Less than ONE the project or task is behind Schedule.

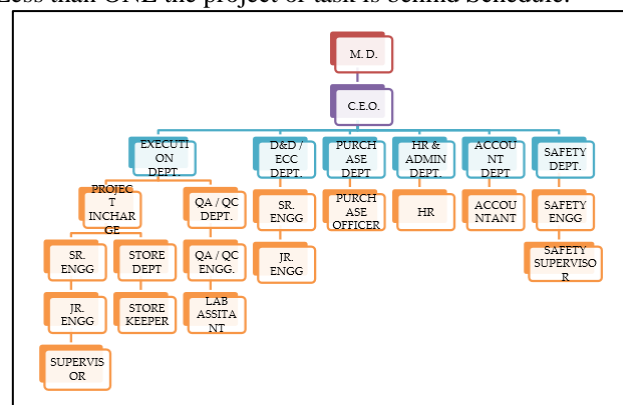


Fig. 2: Showing Organization Breakdown Structure of Case Study

Task Name	Duration	Start	Finish	Planned Cost	RISK TESTER	DURATION	START	FINISH	COST
BLDG - B	156 days	Thu 7/2/15	Tue 9/22/16	₹ 33,823,804.00	BLDG - B	407 days	Wed 7/8/15	Wed 8/17/16	₹ 37,162,700.80
* SUB STRUCTURE	50 days	Thu 7/2/15	Thu 8/20/15	₹ 5,405,169.00	* SUB STRUCTURE	60 days	Wed 7/8/15	Sat 9/5/15	₹ 6,111,948.80
* RCC	124 days	Sun 8/16/15	Thu 12/17/15	₹ 8,548,266.00	* RCC	141 days	Tue 9/1/15	Tue 1/19/16	₹ 9,491,045.12
* BRICK WORK	46 days	Sat 11/14/15	Mon 12/28/15	₹ 1,671,100.00	* BRICK WORK	67 days	Mon 12/14/15	Thu 2/18/16	₹ 2,213,685.12
* WINDOW GRILL / SUBFRAME	38 days	Wed 12/9/15	Fri 1/15/16	₹ 10,800.00	* WINDOW GRILL / SUBFRAME	46 days	Tue 1/19/16	Fri 3/4/16	₹ 13,680.00
* CONCEALED ELECTRIFICATION	35 days	Sun 11/29/15	Mon 12/28/15	₹ 250,000.00	* CONCEALED ELECTRIFICATION	35 days	Tue 1/5/16	Mon 2/8/16	₹ 245,000.00
* BACK COAT FOR TOILET	30 days	Wed 12/9/15	Thu 1/7/16	₹ 135,000.00	* BACK COAT FOR TOILET	38 days	Tue 1/19/16	Thu 2/25/16	₹ 171,000.00
* TOILET WATER PROOFING	38 days	Tue 12/29/15	Thu 2/4/16	₹ 235,000.00	* TOILET WATER PROOFING	38 days	Mon 2/15/16	Wed 3/23/16	₹ 216,000.00
* INTERNAL PLUMBING	30 days	Mon 12/14/15	Tue 2/16/16	₹ 280,000.00	* INTERNAL PLUMBING	35 days	Tue 3/8/16	Mon 4/11/16	₹ 210,000.00
* INTERNAL GYP PLASTER (with material)	57 days	Mon 12/14/15	Mon 2/8/16	₹ 485,000.00	* INTERNAL GYP PLASTER (with material)	67 days	Mon 1/25/16	Thu 3/31/16	₹ 507,500.00
* FABRICATION (with material)	21 days	Tue 2/2/16	Wed 2/24/16	₹ 324,000.00	* FABRICATION (with material)	21 days	Thu 3/24/16	Wed 4/13/16	₹ 310,500.00
EXTERNAL PLASTER	10 days	Thu 2/25/16	Sat 3/5/16 21.24	₹ 2,972,474.88	EXTERNAL PLASTER	10 days	Thu 4/14/16	Sat 4/23/16	₹ 2,972,474.88
TERRACE WATER PROOFING	19 days	Sun 3/24/16	Thu 2/11/16	₹ 85,000.00	TERRACE WATER PROOFING	28 days	Sun 3/13/16	Sat 4/9/16	₹ 110,657.14
FLOORING	22 days	Fri 2/20/16	Fri 2/18/16	₹ 4,690,000.00	FLOORING	29 days	Sat 3/19/16	Sat 4/16/16	₹ 4,443,750.08
INTERNAL PAINTING	45 days	Tue 2/16/16	Thu 3/31/16	₹ 6,090,000.00	INTERNAL PAINTING	50 days	Tue 4/12/16	Tue 5/31/16	₹ 6,597,500.16
FIRE FIGHTING	7 days	Thu 2/18/16	Wed 2/24/16 88	₹ 100,000.00	DOORS/AL. WINDOWS	35 days	Tue 5/17/16	Mon 6/20/16	₹ 236,250.00
LIFT ERECTION	5 days	Thu 2/25/16	Mon 2/29/16 97	₹ 100,000.00	CP/SANITARY FITTINGS	42 days	Mon 5/23/16	Sun 7/3/16	₹ 787,500.00
EXTERNAL PLUMBING	10 days	Fri 3/1/16	Thu 3/10/16 98.82	₹ 40,000.00	SWITCH BOARD FIXING/WIRE PULLING	50 days	Wed 6/8/16	Wed 7/27/16	₹ 540,000.00
TERRACE LOOPING	4 days	Fri 3/11/16	Wed 3/16/16 99	₹ 25,000.00					
DOWN TAKES	12 days	Thu 3/17/16	Mon 3/28/16 100.24	₹ 80,000.00					
DOORS/AL. WINDOWS	35 days	Fri 3/18/16	Sun 4/24/16	₹ 252,000.00					
CP/SANITARY FITTINGS	42 days	Tue 5/26/16	Sun 5/15/16	₹ 900,000.00					
SWITCH BOARD FIXING/WIRE PULLING	50 days	Wed 6/1/16	Wed 6/1/16	₹ 540,000.00					

Table 1: Comparison between Planned and actual Scheduling prepared in MSP

Task Mode	Task Name	Duration	Start	Finish	Cost
Manually Scheduled	BLDG - B	407 days	Wed 7/8/15	Wed 8/17/16	₹ 37,162,700.80
Manually Scheduled	SUB STRUCTURE	60 days	Wed 7/8/15	Sat 9/5/15	₹ 6,111,948.80
Auto Scheduled	RCC	141 days	Tue 9/1/15	Tue 1/19/16	₹ 9,491,045.12
Auto Scheduled	BRICK WORK	67 days	Mon 12/14/15	Thu 2/18/16	₹ 2,213,685.12
Auto Scheduled	WINDOW GRILL / SUBFRAME	46 days	Tue 1/19/16	Fri 3/4/16	₹ 13,680.00
Auto Scheduled	CONCEALED ELECTRIFICATION	35 days	Tue 1/5/16	Mon 2/8/16	₹ 245,000.00
Auto Scheduled	BACK COAT FOR TOILET	38 days	Tue 1/19/16	Thu 2/25/16	₹ 171,000.00
Auto Scheduled	TOILET WATER PROOFING	38 days	Mon 2/15/16	Wed 3/23/16	₹ 216,000.00
Auto Scheduled	INTERNAL PLUMBING	35 days	Tue 3/8/16	Mon 4/11/16	₹ 210,000.00
Auto Scheduled	INTERNAL GYP PLASTER (with material)	67 days	Mon 1/25/16	Thu 3/31/16	₹ 507,500.00
Auto Scheduled	FABRICATION (with material)	21 days	Thu 3/24/16	Wed 4/13/16	₹ 310,500.00
Auto Scheduled	TERRACE WATER PROOFING	28 days	Sun 3/13/16	Sat 4/9/16	₹ 110,657.14
Auto Scheduled	FLOORING	29 days	Sat 3/19/16	Sat 4/16/16	₹ 4,443,750.08
Auto Scheduled	INTERNAL PAINTING	50 days	Tue 4/12/16	Tue 5/31/16	₹ 6,597,500.16
Auto Scheduled	DOORS/AL. WINDOWS	35 days	Tue 5/17/16	Mon 6/20/16	₹ 236,250.00
Auto Scheduled	CP/SANITARY FITTINGS	42 days	Mon 5/23/16	Sun 7/3/16	₹ 787,500.00
Auto Scheduled	SWITCH BOARD FIXING/WIRE PULLING	50 days	Wed 6/8/16	Wed 7/27/16	₹ 540,000.00

Table 2: Actual Cost, WBS and Schedule of Project for only major activities

Above table shows task, work break down structure and planned cost. Similar chart is formed in Microsoft

project showing actual cost instead of plan cost and further checked if project is under budget or over budget.

ID	Task Name	Duration	Start	Finish	Predecessor	Planned Cost	Baseline Start	Baseline Finish	Baseline Duration	Baseline Cost	% Complete
1	Bldg B	300 days	Mon 06-07-18	Tue 18-07-18		₹ 38,263,304.81	Thu 01-07-18	Tue 21-06-18	206 days	₹ 33,821,364.00	20%
2	SUB STRUCTURE	60 days	Mon 06-07-18	Thu 03-08-18		₹ 6,131,848.68	Thu 01-07-18	Thu 29-08-18	59 days	₹ 5,496,389.08	100%
3	Excavation	7 days	Mon 06-07-18	Sun 12-07-18		₹ 249,576.00	Thu 01-07-18	Mon 06-07-18	7 days	₹ 178,269.00	100%
4	PCC for Footing	19 days	Mon 13-07-18	Wed 22-07-18	3	₹ 391,000.00	Tue 27-07-18	Mon 13-07-18	7 days	₹ 590,700.00	100%
5	Footing Casting	33 days	Sun 11-07-18	Wed 18-08-18	4FS-5 days	₹ 4,807,880.00	Thu 01-07-18	Fri 17-08-18	50 days	₹ 4,370,800.00	100%
6	Stub Column	9 days	Sun 13-08-18	Sun 23-08-18	5FS-5 days	₹ 390,362.00	Mon 13-08-18	Mon 13-08-18	3 days	₹ 338,100.00	100%
7	Back Filling	15 days	Wed 16-08-18	Fri 26-08-18	6FS-5 days	₹ 320,000.00	Thu 06-08-18	Sun 13-08-18	10 days	₹ 320,000.00	100%
8	Plinth Beam	11 days	Mon 24-08-18	Thu 03-09-18	7FS-5 days	₹ 53,130.00	Tue 11-08-18	Thu 20-08-18	10 days	₹ 48,300.00	100%
9	RCC	138 days	Sun 26-08-18	Thu 14-03-18		₹ 9,333,890.91	Sun 18-08-18	Thu 17-12-18	124 days	₹ 8,848,389.08	70%
10	1ST SLAB	25 days	Sun 26-08-18	Sat 26-09-18	8FS-5 days	₹ 1,510,181.82	Sun 26-08-18	Sun 26-09-18	22 days	₹ 1,218,000.00	100%
11	2ND SLAB	24 days	Tue 22-09-18	Thu 19-10-18	10FS-5 days	₹ 1,333,767.27	Wed 22-09-18	Wed 22-09-18	22 days	₹ 1,222,620.00	100%
12	3RD SLAB	25 days	Sun 11-10-18	Wed 04-11-18	11FS-5 days	₹ 1,384,090.91	Sun 19-09-18	Sun 19-10-18	22 days	₹ 1,216,000.00	100%
13	4TH SLAB	23 days	Sun 31-10-18	Sun 23-11-18	12FS-5 days	₹ 1,278,193.64	Tue 26-10-18	Tue 27-10-18	22 days	₹ 1,222,620.00	100%
14	5TH SLAB	24 days	Wed 14-11-18	Fri 11-12-18	13FS-5 days	₹ 1,328,727.27	Fri 23-10-18	Fri 13-11-18	22 days	₹ 1,218,000.00	75%
15	6TH SLAB	22 days	Mon 07-12-18	Mon 29-12-18	14FS-5 days	₹ 1,222,620.00	Mon 09-11-18	Mon 30-11-18	22 days	₹ 1,222,620.00	0%
16	7TH SLAB	22 days	Thu 24-12-18	Thu 14-01-19	15FS-5 days	₹ 1,226,400.00	Thu 24-12-18	Thu 17-01-19	22 days	₹ 1,226,400.00	0%
17	BRICK WORK	48 days	Sun 12-12-18	Mon 28-01-19		₹ 1,879,389.08	Sun 14-11-18	Mon 28-12-18	48 days	₹ 1,879,389.08	0%
18	AT 1ST FLOOR	10 days	Sun 12-12-18	Mon 22-12-18	14	₹ 248,850.00	Sun 14-11-18	Mon 22-11-18	10 days	₹ 248,850.00	0%
19	AT 2ND FLOOR	10 days	Thu 17-12-18	Sat 26-12-18	15FS-5 days	₹ 248,850.00	Thu 19-11-18	Sat 28-11-18	10 days	₹ 248,850.00	0%
20	AT 3RD FLOOR	10 days	Tue 22-12-18	Thu 31-12-18	16FS-5 days	₹ 248,850.00	Tue 24-11-18	Thu 03-12-18	10 days	₹ 248,850.00	0%
21	AT 4TH FLOOR	10 days	Sun 27-12-18	Tue 05-01-19	17FS-5 days	₹ 248,850.00	Sun 29-11-18	Tue 06-12-18	10 days	₹ 248,850.00	0%
22	AT 5TH FLOOR	15 days	Fri 01-01-19	Sun 10-01-19	18FS-5 days	₹ 248,850.00	Fri 04-12-18	Sun 13-12-18	10 days	₹ 248,850.00	0%
23	AT 6TH FLOOR	10 days	Wed 06-01-19	Fri 15-01-19	19FS-5 days	₹ 248,850.00	Wed 09-12-18	Fri 18-12-18	10 days	₹ 248,850.00	0%
24	BRICK WORK ABOVE TERRACE	10 days	Sun 16-01-19	Mon 25-01-19	20,16	₹ 180,000.00	Sun 19-12-18	Mon 28-12-18	10 days	₹ 180,000.00	0%

Table 3: The Set of base line for Case study from Microsoft Project

ID	Task Name	Planned Value - PV (BCWS)	Earned Value - EV (BCWP)	AC (ACWP)	SV	CV	EAC	BAC	VAC
1	Building - B								
2	Substructure								
3	Excavation	₹ 1,78,269.00	₹ 1,78,269.00	₹ 2,49,576.60	₹ 0.00	₹ -71,307.60	₹ 2,49,576.60	₹ 1,78,269.00	₹ -71,307.60
4	PCC for Footing	₹ 3,50,700.00	₹ 3,50,700.00	₹ 5,01,000.00	₹ 0.00	₹ -1,50,300.00	₹ 5,01,000.00	₹ 3,50,700.00	₹ -1,50,300.00
5	Footing Casting	₹ 43,70,800.00	₹ 43,70,800.00	₹ 48,07,880.00	₹ 0.00	₹ -4,37,080.00	₹ 48,07,880.00	₹ 43,70,800.00	₹ -4,37,080.00
6	Stub Column	₹ 3,38,100.00	₹ 3,38,100.00	₹ 3,80,362.00	₹ 0.00	₹ -42,262.00	₹ 3,80,362.00	₹ 3,38,100.00	₹ -42,262.00
7	Back Filling	₹ 1,20,000.00	₹ 1,20,000.00	₹ 1,20,000.00	₹ 0.00	₹ 0.00	₹ 1,20,000.00	₹ 1,20,000.00	₹ 0.00
8	Plinth Beam	₹ 48,300.00	₹ 48,300.00	₹ 53,130.00	₹ 0.00	₹ -4,830.00	₹ 53,130.00	₹ 48,300.00	₹ -4,830.00
9	RCC								
10	1ST SLAB	₹ 12,18,000.00	₹ 12,18,000.00	₹ 15,50,181.82	₹ 0.00	₹ -3,32,181.82	₹ 15,50,181.82	₹ 12,18,000.00	₹ -3,32,181.82
11	2ND SLAB	₹ 12,22,620.00	₹ 12,22,620.00	₹ 13,33,767.27	₹ 0.00	₹ -1,11,147.27	₹ 13,33,767.27	₹ 12,22,620.00	₹ -1,11,147.27
12	3RD SLAB	₹ 12,18,000.00	₹ 12,18,000.00	₹ 13,84,090.91	₹ 0.00	₹ -1,66,090.91	₹ 13,84,090.91	₹ 12,18,000.00	₹ -1,66,090.91
13	4TH SLAB	₹ 12,22,620.00	₹ 12,22,620.00	₹ 12,78,193.64	₹ 0.00	₹ -55,573.64	₹ 12,78,193.64	₹ 12,22,620.00	₹ -55,573.64
14	5TH SLAB	₹ 12,18,000.00	₹ 6,59,750.00	₹ 7,19,727.27	₹ -5,58,250.00	₹ -59,977.27	₹ 13,28,727.27	₹ 12,18,000.00	₹ -1,10,727.27
15	6TH SLAB	₹ 12,22,620.00	₹ 0.00	₹ 0.00	₹ -12,22,620.00	₹ 0.00	₹ 12,22,620.00	₹ 12,22,620.00	₹ 0.00
16	7TH SLAB	₹ 2,78,727.27	₹ 0.00	₹ 0.00	₹ -2,78,727.27	₹ 0.00	₹ 12,26,400.00	₹ 12,26,400.00	₹ 0.00
17	Brickwork								
18	AT 1ST FLOOR	₹ 2,48,850.00	₹ 0.00	₹ 0.00	₹ -2,48,850.00	₹ 0.00	₹ 2,48,850.00	₹ 2,48,850.00	₹ 0.00
19	AT 2ND FLOOR	₹ 2,48,850.00	₹ 0.00	₹ 0.00	₹ -2,48,850.00	₹ 0.00	₹ 2,48,850.00	₹ 2,48,850.00	₹ 0.00
20	AT 3RD FLOOR	₹ 1,74,193.00	₹ 0.00	₹ 0.00	₹ -1,74,193.00	₹ 0.00	₹ 2,48,850.00	₹ 2,48,850.00	₹ 0.00
21	AT 4TH FLOOR	₹ 49,770.00	₹ 0.00	₹ 0.00	₹ -49,770.00	₹ 0.00	₹ 2,48,850.00	₹ 2,48,850.00	₹ 0.00

Table 4: Combined results in MSP and Spreadsheet showing Variance in Cost at First Base Line Set

Year	Quarter	Week	Data		
			Earned Value	Planned Value	AC
2015	Q2	Week 26		106961.4	
		Q2 Total		106961.4	
	Q3	Week 27	152798.8166	865849	213922.8
		Week 28	521118.1694	1985902.333	695869.9333
		Week 29	1588554.119	3005755.667	1916123.267
		Week 30	2515679.717	4025609	2935976.6
		Week 31	3442835.667	5189344	3955829.933
		Week 32	4407522.061	5382019	5017945.711
		Week 33	5248299.398	5793714.455	5944556.156
		Week 34	5384213.631	6181259.909	6087798.6
	Q4	Week 35	5710669	6791099.909	6499494.055
		Week 36	6015169	7235479	6887039.51
		Week 37	6319669	7679858.091	7274584.965
		Week 38	6878881.5	8289698.091	7939998.601
		Week 39	7235479	8677243.545	8329014.055
	Q3 Total		7235479	8677243.545	8329014.055
	Q4	Week 40	7592076.5	9342657.182	8718029.509
		Week 41	8187829	9731672.636	9383443.145
		Week 42	8528869	10231415.36	9770988.6
Week 43		8923062.868	10785681.73	10214107.69	
Week 44		9490043.097	11173227.18	10824577.69	
Week 45		10068688.83	11863735.82	11213593.15	

			Data		
Year	Quarter	Week	Earned Value	Planned Value	AC
		Week 46	10643789.05	12501601.27	11824063.15
		Week 47	11052204.5	13406243.09	12267182.24
		Week 48	11407454.5	14304998.55	12654727.69
		Week 49	12030972.23	15112046.73	13345236.33
		Week 50	12420243.11	15708769	13933331.78
		Week 51	13103425.82	15989569	14762884.22
		Week 52	13470946	16079679	15177532.22
	Q4 Total		13470946	16079679	15177532.22
2015 Total			13470946	16079679	15177532.22
Grand Total			13470946	16079679	15177532.22

Table 5: Showing baseline calculations for specific baseline set.

IV. CONCLUSIONS

Earned Value Analysis is very effective tool for the performance measurement as it facilitates progress of project in terms of cost and schedule analysis and it also predicts future performance which will be easier for further financial planning as both schedule and cost variance are affecting the financial planning of project. In depth conclusions:

- 1) Paper concluded that Earned Value Management is “early warning signal” that enables authority to identify and control the problems before they become insurmountable. It allows projects to be managed better – on time and under budget.
- 2) 2. Results obtained from analysis gives negative values of Cost Variance conclude that the considered projects are over budgeted projects.
- 3) 3. Analysis of data gives negative values of Schedule Variance From which conclusion can be drawn that projects are behind schedule projects.
- 4) 4. Project management system is directly responsible on effective planning, proper monitoring and controlling of construction project with use of project management software. This study shows importance, implementation and unique features of earned value management that benefits project management and ultimately results in project’s financial status. The construction sectors which do not use Project Management 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 Project Management teams. The use of such software’s helps to complete the project on schedule time and cost.

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