Challenges of Earned Value Management-Application in Indian Construction Industry

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Abstract: *The predominant goal of a construction industry is to cessation the projects on schedule and within the budget, with proper usance of all the resources. But most of the project runs over budget, lagging behind the schedule. Earned value management (EVM) is one of the techniques to overcome the issues related to the schedule and budget. EVM helps to track the project performance by delivering the schedule variance, cost variance and their performance index. The objective of this study is to survey the challenges in applying earned value management to the ongoing projects in the Indian construction industry. After, conducting structured questionnaire survey and interviews some of the challenges in application of EVM were recognized. Depending on the personal comments given by different construction managers nine of challenges are observed and each of them is briefly discussed. Financing and late payment of the completed work, pressures to report only good news and inaccurate assessment of project time are the top rated challenges gleaned from the study. The personal interviews reveal that lacking in using earned value management software is the major cause with 55% responses*

Index Terms: *Earned value management, project performance Schedule variance, Cost variance, Performance index*

I. INTRODUCTION

The construction industry is a very vast industry, where the rate of dead loss of construction contractors is giant. Earned value management (EVM) is a valuable technique to discern real yield and losses in project of all scales. As per the Project Management Body of Knowledge (PMBOK) guide EVM can be defined as "EVM in its various forms is a commonly used method of performance measurements. It integrates the project scope, cost and schedule measures to help the project management team assess and measures the project performance and progress". EVM is also used in a variety of companies in the private sector, such as educational establishments, industries and consulting firms. Top organizations run through EVM are Project Management Institute (PMI), NASA, Society of Cost Estimating and Analysis, etc.

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II. LITERATURE REVIEW

Ankur Verma et.al. (2014) discussed about the earned value analysis (EVA) parameters and the calculation of EVA using primavera p6 in the construction projects [1]. B.Prkash Rao and Jacob Cherian(2015) studied to identify the cultural dimensions in the Indian construction organizations that inhibit the acceptance of EVM in their organization. They found that Uncertainty Avoidance, Masculinity and Feminist and Power Distance are the top three ranked Cultural Dimensions [2]. J.Ordieres-Mere et.al. (2008) indulged to set up proposals regarding the improvement of EVM tool [3]. Mark Gershon (2013) discussed about the importance of Earned Value Analysis (EVA) tool for controlling project performance [4]. Radhika Gupta (2014) described about the significance of EVMS in the project [5]. Rajesh Ganpat Virle & Sumedh Y Mhaske(2013) illustrated about the schedule forecasting, questions & the manager's considerations in a construction project [6]. Tan Chin-Keng (2015) tried to investigate the application of EVM in Malaysian construction industry [7].Walt Lipke (2003) showed the flaws in the schedule parameters used in EVA. Walt Lipke examined and compared earned value management method to the earned schedule prediction technique [8] [9].

III. OBJECTIVES

The main objective is to determine the top challenges that are affecting the application of earned value management in Indian construction.

IV. METHODOLOGY AND FINDINGS

A. *Questionnaire Survey and Data Gathering*

- Questionnaire survey and personal interviews conducted among the various organizations where, thirty respondents (Planning managers, project managers & senior level managers) opinion was collected through questionnaire survey and twenty respondents comment was collected through interviews.
- Questionnaire survey consists of two parts where Nine Predetermined challenges as a part 1 and personal opinion as a part 2.

B. *Rating Criteria*

- Rating criteria includes 10 point Likert scale where, ten being very high, five being moderate and one being very low impact degree of factor.

- Respondents are made to mark the particular challenges based on their experience.
- Average of each challenge is considered to arrange them in ranks.

V. RESULTS

Based on the results obtained from questionnaire survey and personal interview the top ranked challenges are-

1) *Lack of proper training and experience of PM (Project manager)*

   In the Indian construction industry, most of the PM's are not experienced in using earned value management technique and even the industry expects some training programs related to EVM because earned value is something more than simple conceptualization done in projects.

2) *Shortfall to accept new technique*

   Most of the construction organizations in India are not ready to accept the neoteric tool. They prefer the methods that they have followed for decades because organization might have the fear of failure and negatively reciprocate.

3) *Inaccurate calculation of actual cost.*

   The actual cost is the main factor in EVM technique; if the actual cost calculation is inaccurate, then the earned value metric shows wrong result. Depending on subcontractors for actual cost recording may hinder the calculation. So, one must be very careful in collecting actual cost from Enterprise resource planning (ERP) to measure the performance.

4) *Lack of management support*

   Sometimes a good manager may agree to accept new ideas. Most of the managers do not support these ideas because the improper decision related to the project tools and project performance also affects on the revenue of the company and management will be not ready to digest the risk.

5) *Poor documentation process*

   EVM requires some documentation related to budget, this becomes difficult to a PM when the project has multiple vendors. The process becomes deficient when the organization depends on the vendors for documents. If the process is not compatible with EVM then, the chance of project survival is slighter.

6) *Financing & late payment of completed work*

   Getting approval of inspection from the engineer becomes sometime later; in this condition payment will be not processed even though the work is completed. Collecting invoices to record spent cost and maintaining the same is the strenuous work when there is a late payment of completed work.

7) *Inaccurate assessment of project time*

   Schedule variance and schedule performance index are not time-based indicators. The drawback of EVM method is it is not reliable toward the end of the project. Earned schedule management can be used to overcome the above problem and earned schedule management is the extension to earned value management.

8) *Fear of making the wrong decision*

   Earned value technique is not like common visualization of the project performance. If one doesn't have enough confidence in implementing EVM to the project, then

that creates a fear of making mistakes. Apprehension always leads to the wrong decision and dereliction of the project.

9) *Pressures to report only good news*

It is obvious that a project manager will be in coercion to announce good news rather than reporting budget overrun or project behind schedule. This can also be considered as a mental challenge in the application of EVM.

EVM challenges with respect to the degree of impact is graphically shown in Fig1 and the personal interview responses is shown in Fig.2
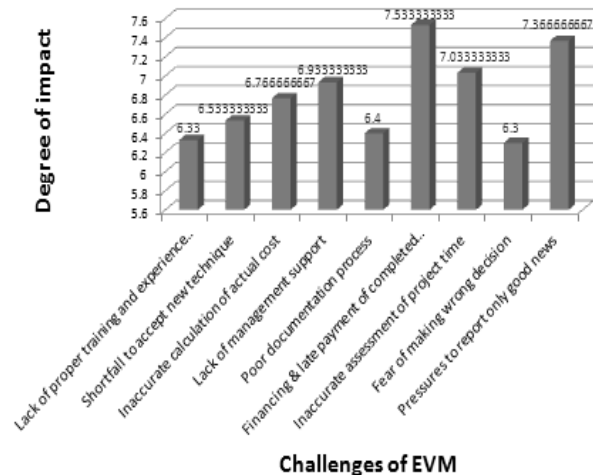

Fig 1: Graphical representation of EVM challenges with respect to the degree of impact.
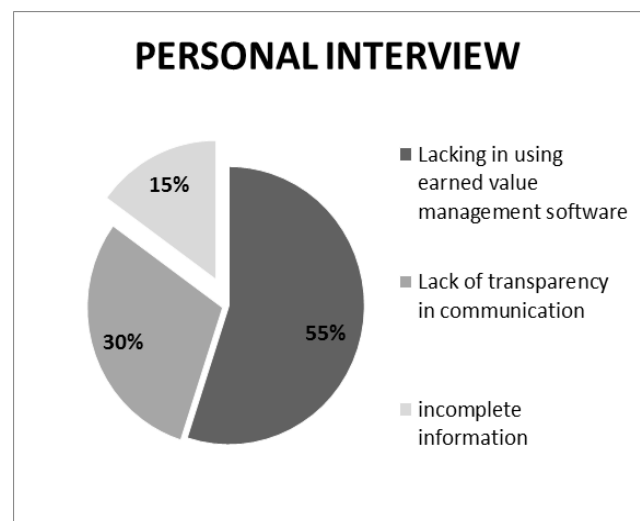

Fig 2: Personal interview responses

VI. CONCLUSION

The construction industry may confront few of the above earned value management challenges. The study shows that Financing & late payment of completed work is the top ranked challenge. Pressures to report only good news, Inaccurate assessment of project time and Lack of management support are the more prioritized challenges. Lacking in using earned value management software to get accurate results and Lack of transparency in communication and incomplete information are the reiterated statements in the interview.

Despite the confrontation of an earned value management system, it is the magnificent tool to monitor the project. But most of the organization fails to fetch the complete usage of EVM system.

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