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TO EXAMINE SCHEDULE AND COST OVERTURN ELEMENTS IN CONSTRUCTION INDUSTRY

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ABSTRACT

In all over the world, in construction industry success is mainly depend upon the time and cost performance. Moreover, anywhere in world, the construction industry is facing a lot of problems related to cost and time effectiveness. Thus, majority of projects related to construction faces schedule and cost overturn. Therefore, this paper mainly focused on investigation of cost and schedule overturns, assessing influencing factors and its effect on client needs. For achieving the objectives of this study existing articles and survey form utilized. The survey form consisting two sections i.e. General information, affecting factors on cost and schedule overturns collected from existing literatures. Total of 100 survey forms distributed among various construction professionals related to construction industry for time of two weeks. 70% respondent filled the form and returned back. Based on this filled form the data processed and analyzed. For ranking of affecting factors relative importance index method used. It is concluded that due to delay of time 92% of projects are failed while only 8% of project are completed within stipulated period of time as response given by respondents. The amount of time overrun was 10% as agreed by respondents. While in case of cost it is concluded that 89% of projects completed beyond allocated budget while only 11% of project completed within budget limitations as agreed in contract documents. Moreover, it is also concluded that problems related design and documentation caused major contribution to both time and cost performance followed by management of financial resource management, and project management and contract administration. Thus, it is strongly recommended to plan activities properly as per their cost and duration before implementation. In addition, proper monitoring and client need must be ensured during construction projects.

Keyword's: Time and cost performance, Construction industry, existing literatures, Survey form, Relative Importance Index, Schedule and cost overturns

I. INTRODUCTION:

In the development of any nation industry of construction played very essential role because this sector is dynamic highly. Throughout the world, growth of industry is rapid when started at once. But due to facing lot of issues i.e. cost and time overturns, waste of construction, poor production and depended on workers having from foreign. Keeping in view these issues, the main issues are time and cost overturn in construction industry. In Malaysia, only 37.24% and 46.83% of private and public sectors projects are completed within allocated budget.

While 33.3% and 20.55 % of public and private projects were completed within stipulated period of time [1]. Beside this, lack of study was also found on construction related factors [2]. It was also seen that construction manager became burdened and difficult for him to deliver the project within allocated budget and time because of projects increasing complexation. Thus, to achieved targeted project within time and cost it is important for manager having strong skills of judgement.

The delay in project was also occurred due to consultants, contractors and clients loathing. The Purpose of controlling the project was to complete it within stipulated period of time and cost allocated for said project [3].

In addition, A project was said to be successful if having following qualities i.e. in time completion, in cost completion and completed with technical performance [4]. Thus, to achieve the project successfully two factors are very essential to measure the success performance i.e. cost and time.

More ever, failure of these two parameters lead project toward cost and time overturn. If the projects were completed beyond its schedule or planned time as mentioned or agreed in contract timeline with consultant or client know as time overturn of project. This delay occurred due to slow progress of work and thus remained behind the timeline. This may be caused due to any one of the parties i.e. consultants, contractors, clients and directly influenced both the owner and contractor (in term of cost specially) which directly lead to conflicts between parties [5].

Usually, delay in projects happened because of internal and external reasons of project activities and thus relationship was affected. In this case, actual and estimated completion date are different from each other. The difference was measured in number of days. Delays in project occurred due to extension of time. Thus, it can also be defined in such a way that delay in project schedule caused due to project surrounding internal and external issues.

Delays are events that influence project's growth and defer project events. The factors causing delay in project time included i.e. weather, resources absence, design, etc. In general, project interruptions occurred due to project activities that have both external and internal reasons and effect relationship. The variation occurred between actual and contract limited cost is considered as cost overrun.

This can occur as result of increase in cost from its limit as mentioned or agreed in contract documents. More ever, limit of cost is defined as "the rate/cost which defined by owner/client of project within its contract documents for each item of given project [6]. The cost which is increased beyond its limit directly enhance project cost and affects investment decision-making [7]. The cost overturn of any construction project may be formulated as given below

Cost Overrun = (Final Contract Amount – Original Contract Amount) / Original Contract Amount

II. LITERATURE REVIEW:

Various type of research study was conducted throughout world to outline the issue of cost and time overturn in construction projects. According to [8], it was concluded that 16% of projects among 8000 construction projects meet successfully with in time, cost and project quality standards as specified in contract documents. According to [9], during infrastructures transportation projects covered 258 projects implementing in 20 countries globally on issue of cost overturn which showed that 90% of project facing cost overturn issue.

At global level two parameters delay the progress of construction i.e. time and cost which also reported. [10]. These types of issue were also faced in every country of world significantly. During study conducted on delay factors in construction project in Malaysian construction industry, it was found that time overturn is most essential factor affecting the project because 87% participants reported this issue.

While 10-40% participants reported duration of contract as influencing factor [11]. Furthermore, study conducting on large projects showed that construction project delayed by contract duration with average of 23.75% [12]. In country of Malaysia cost overturn in construction projects is very common issue [13].

Examined construction projects i.e. residential in country of Turkey and determined 40 factors which affected the cost overturn of projects related to construction. The major factors which identified during this study included improper planning, imprecise estimation, Resources high cost, absence of skilled workers, high price of construction materials and land [14].

In this study to achieve essential information which caused cost overturn in projects of building construction qualitative research approach was adopted. Based on responses of respondents the factors are ranked and showed that the major reasons of cost overturns included i.e. Price fluctuation materials, less experience in construction work, deficient time, and partial drawings [15].

In this study construction of projects related to wastewater was examined in order to find influencing factors causing variation in const of projects. The projects are located in Egypt. For this purpose, a survey included different experts and representatives from construction companies was conducted. Using questionnaire survey factors which affected cost variation was found 52 in which major factors are Availability of raw materials, provision of sufficient time, cost design phase, fake prevention, unpackaged material purchase and by applying short term goals. Moreover, it was also concluded that variation occurred in contractor verses owner originated or designed projects [16].

I. OBJECTIVES OF STUDY

Following are main objectives of this research paper

- Cost and time overturn in construction projects investigation and give recommendation to minimize this issue in future projects.
- To identified collected factors which directly affect the cost and time delays in projects.

- Assessment the cause of most essential factors
- To know cost and time delay effect on client.

III. RESEARCH METHODOLOGY

Based on existing research articles a questionnaire was developed to know the most influencing factors on construction project having delays due to time and cost. The questionnaire contained two section i.e. Section A composed general information related to respondents and section B showed collected factors influencing the time and cost of projects. In addition, to collect data about time and cost performance of construction, 5-point likert scale as V.I (Very Important), I (Important), M.I (Moderately Important), S.I (Slightly Important) and N.I (Not Important) was adopted to know the insight of the client, consultant and contractors organization which are involved in implementation of projects (attached as Annex). The questionnaire was distributed among 100 individuals related to construction industry. Two weeks were given to fill the questionnaire and send back. After two weeks 75 respondent's response was received. To find the importance and ranking of cost and time delays factors calculation of Relative Importance index (RII) was used. Mathematically RII was calculated as give below in equation as

$$RII = \Sigma W / (A*N) \quad (1)$$

Where,

W = Weighting given to each factor by the respondents (1 to 5),

A = Highest weight (i.e. 5)

N= total number of respondents.

Greater value of RII showed that cause of delay is more important

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IV. RESULTS AND DISCUSSIONS

Based on questionnaire section 1 the general information of respondents is shown in table 1.

Table 1. Respondents General Information

	Frequency	%age	Cumulative
Organization Type			
Client	14	18.67	18.67
Consultant	26	34.67	53.33
Contractor	35	46.67	100

Project Size (Million)			
1-5 M	23	30.67	30.67
6-10 M	22	29.33	60
10-50 M	21	28.00	88
Above 50 Million	9	12.00	100
Academic Qualification			
BE Civil	33	44.00	44
MS Civil	27	36.00	80
Diploma Civil	15	20.00	100
Working Experience (years)			
0-5	19	25.33	25.33
6-10	37	49.33	74.67
11-15	19	25.33	100

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Table 1 clearly showed that 46.67 % organization are from contractor side followed by consultant and then client with percentages of 34.67 and 18.67% respectively. 44% of responded are professionally qualified having BS in Civil engineering while 36 % are specialized in their professional qualifications. 49.33% of respondents having experience up to 10 years. This showed that data was collected from capable and competent respondents during this survey.

In construction projects time delays was also measured during this study and the performance of time delays in projects were shown in Table 2 as completed in last 5-10 years.

Table 2. Performance of time delays

Time Overturn %age	Frequency	%age	Cumulative
0	5	6.667	6.67
5	9	12	18.67
10	13	17.33	36
15	19	25.33	61.33
More than 15	29	38.67	100

Based on above results of table 2, it was clearly stated that 6.67 % of respondents mentioned 0 % projects were completed within stipulated period of time as mentioned or agreed in contractor documents. While 38.67% of responses showed that more than 15% of project was delayed due to time overturn in projects of construction. Similarly, 25.33%, 17.33% and 12% responds 15%,10% and 5%-time delay in construction project, respectively.

Similarly, in construction projects cost delays was also measured during this study and the performance of cost delays in projects were shown in Table 2 as completed in last 5-10 years. Cost overturn was one of essential problem facing in construction industry. Though, variation occurred and based on various projects. The cost overturn project results were shown in Fig 2.

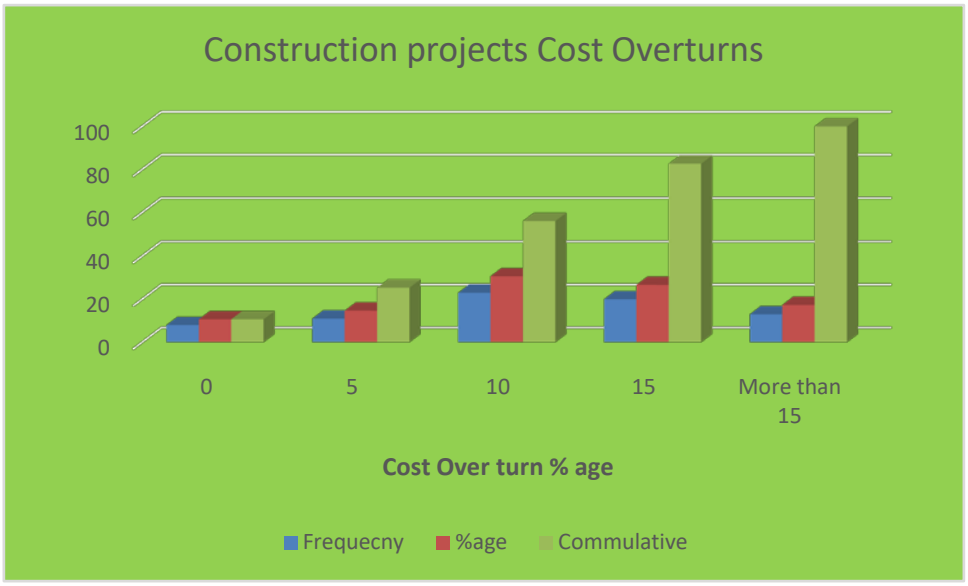

Fig 1. Construction Projects Cost Overturns

Based on above results as shown in figure 2, it was clearly stated that 10.67 % of respondents mentioned 0 % projects were completed within allocated budget as mentioned or agreed in contractor documents. While 30.67% of responses showed that15% of construction projects was delayed due to cost overturn in projects of construction. Similarly, 14.67%, 26.67% and 17.33% responds 5%,10% and more than 15%-cost overturns in construction project, respectively.

Based on survey conducted during this study, most essential and important factors that effected that cost and time overturns are investigated on the bases of RII and shown in table 3.

Table 3 Causes Affecting Time and Cost Performance

S.no	Factors affecting Cost and Time	RII	Ranking
1	Design and Documentation Issues	0.80	1
2	Financial Resource Management	0.79	2
3	Project Management and Contract Administration	0.79	2
4	Contractors Site Management	0.78	3
5	Information and Communication Technology	0.78	3
6	Material and Machinery Resource	0.75	4
7	Labor (Human) Resource	0.75	4
8	External factors	0.72	5

Table 3 showed that in construction projects design and documentation related problems are very important and affected the performance of time and cost. While financial resource management and project and contract management was ranked as second. Regarding financial matters, the contractor's respondents the owner delayed the payment which directly affect the contractor cash flow thus time and cost performance is affected in projects.

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V. CONCLUSIONS AND RECOMMENDATIONS

In construction industry two parameters i.e. time and cost very important role because overturns of both parameters can lead directly project failure. Thus, this study mainly focused on major factors which affected the time and cost overturn during construction projects in construction industry. Based on above results and discussion it was concluded that

- 93% projects are failed or delayed due to variation in actual time as mentioned in contract documents.
- 89 % projects or failed or delayed due to cost extension as compared to its contract estimated cost.
- The amount of cost and time overturn was more than 15% and 10% respectively as responded by respondents.
- The major factors which affected the performance of cost and time is issue which are related to design and documentation followed by financial resource management and project and contract management.

Thus, based on above conclusion it following recommendations are made

- Every task/activity must be planned properly before its implementation keeping in view its duration and cost.
- Close monitoring during the construction work to avoid any mishap.
- Clients need must be focused.
- Routine monitoring of planned vs achieved activities on site
- Progress meeting on regular bases must be ensured.
- Improving contract award procedure by giving less weight to prices and more weight to the capabilities and past performance of contractors

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