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CONTRACTOR PERSPECTIVE ON TIME OVERRUN FACTORS IN MALAYSIAN CONSTRUCTION PROJECTS

Aftab Hameed Memon
Department of Civil Engineering, Quaid-e-Awam University of Engineering, Sciences and Technology Nawabshah, Sindh, Pakistan

Abstract: Time overrun has become a major concern in construction projects worldwide including Malaysia. The occurrence of the over run in time is caused due to several factors. This paper has investigated significant factors which cause time overrun run in Malaysian construction projects. For this investigation, data was carried out through survey among the contractors registered under top two categories of G6 and G7 with Construction Industry Development Board (CIDB). Average index calculation of the gathered data showed that frequent design changes, change in the scope of the project, financial difficulties of owner, delays in decisions making and unforeseen ground condition are major factors of time overrun. These factors are owner related issue, hence for improving time performance owners are required to adopt effective contract management
Keywords: Construction Time Overrun, Time Overrun Factors, Malaysia, Contractors.

INTRODUCTION

Construction industry is an essential component for driving the economy of any country. Hence, worldwide huge amounts are spent on construction development works. In Malaysia also, development works are growing rapidly. However, this industry is suffering from a major issue of time overrun or delay continuously since many years [1]. Time overrun highlights the non-completion of project within the specified duration as agreed upon in contract. Time overrun is currently a common problem in many of construction projects which causes considerable losses to project parties. Loss of time in any projects influences drastically on project success [2]. The issue of time overrun in construction industry is frequently reported by many researchers from different countries such as Egypt, India, Hong Kong and others. Similarly, in Malaysian construction industry time overrun is one of the critical problems faced by the construction industry [3].

Time overrun is a severe problem in the construction industry where only rare projects are completed on the estimated time. In a study of construction industry of India, Pai and Bharath [4] found that the infrastructure projects experience time overrun up to 500% of the estimated time. In Egypt, Marzouk and El-Rasas [2] found that only 75.41% of building construction

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projects were completed on time with minimum of 24.59% of time overrun compared to estimated time. A study conducted by Endut et. al. [5] in Malaysia showed that only 20.5% of the public projects 33.35% of the private sector projects were completed within the time while in a survey among construction practitioners of central and southern part of Malaysia, 89% of respondent mentioned that they are facing the problem of time overrun in their projects [6]. This shows that time overrun is a severe problem which needs to be controlled. For effective control of time overrun, it is very essential to identify major factors which cause this problem. Hence, this paper is focusing on identifying the causes of time overrun in construction projects of Malaysia. However, the respondents involved in collection of data were limited to contractors involved in handling construction projects which are registered under G6 and G7 groups with CIDB.

LITERATURE REVIEW

Time performance is the most important indicator of project success [7]. Project are considered as overrun in time which are completed beyond the date of completion specified in a contract, or beyond the date that the parties agreed upon for delivery of a project. It is a project slipping over its planned schedule. Time overrun is caused by various reasons such as poor site management and supervision which can affect the productivity [8]. Various researchers have highlighted several factors affecting time overrun. For expample; improper planning and Lack of communication were reported as the main causes of time overrun in construction industry of Nigeria [9]. Pai and Bharath [4] investigating the infrastructure projects in India through questionnaire survey found 73 factor of time overrun. Among these factors, major factors of time overrun from the view of Contractor were design changes, delay in progress payment by owner, late revision and approval by owner from the perspective of owner, shortage of labour, financial and cash flow problems, ineffective planning and scheduling; and poor site management and supervision. Marzouk and El-Rasas [2] identified 73 factors of time overrun in Egypt, where the major factors are ineffective planning and scheduling of project, difficulties in financing project by contractor, variation orders/changes of scope by owner during construction, poor site management and supervision, type of project bidding and award (negotiation, lowest bidder), low productivity level of labors, effects of subsurface conditions (e.g., soil, high water table, etc.), unqualified workforce, shortage of construction materials in market, and delays in sub-contractors work. Gündüz et. al. [10] investigating the construction projects in Turkey, through interview and questionnaire survey with 64 highly experienced construction professionals which include

project managers, site managers, technical office managers, technical office engineers, procurement managers, and technical consultants identified 83 factors of time overrun. Among these, inadequate contractor experience, ineffective project planning and scheduling, poor site management and supervision, design changes by owner or agent during construction, late delivery of materials, unreliable subcontractors, delay in performing inspection and testing, unqualified/inexperienced workers, change orders, delay in site delivery, delay in approving design documents, delay in progress payments, slowness in decision making and poor communication and coordination were found as major factors of time overrun. Danso and Antwi [11] through survey in Ghana highlighted that top ten factors of time overrun are delays of payments certificates, unrealistic clients requirements, lack of tower materials in the local markets, delay in design work and design information and contract modification, poor workmanship leading to rework, poor site management, unethical behavior of contractors to achieve high profits, uncompromising attitudes between parties and design scope changes. Doloi et al., [12] mentioned that lack of commitment, inefficient site management, poor site coordination, improper planning, lack of clarity in project scope, lack of communication, substandard contract, slow decision from owner, poor labour productivity, architects' reluctance for change and rework due to mistakes in construction cause time overrun in Indian construction projects. Sanni and Hashim [13] investigated construction projects in Nigeria through questionnaire survey. They found that the major factors of time overrun are improper contract document, engagement of inexperienced staff, unstable market condition, complexity of the project, unstable government regulations, choice of procurement method and lack of research and innovation. Murray and Seif [14] highlighted that 12 major factors of time overrun are lack of due process at the design and construction stages of most projects, lack of Proper project schedule by the contractors and improper planning, contractor’s poor site management, contractor’s poor experience, inadequate fund on the side of the clients and untimely payments for completed work, problems with subcontractors, lack of materials, lack of skilled labour, equipment availability and failure, poor communication between parties, mistakes during the construction stage, and incomplete working drawings and unapproved drawings. Vidalis and Najafi [15] studied time overrun factor in highway construction projects in Florida (USA), through the help of FDOT. The major factor of time overrun in Florida high way construction project are plans modifications, changed conditions, lack of project coordination, and design related problems, design factors, changed conditions, and designer errors and omissions by the consultants. Sweis et al. [16] investigating time

overrun issue in residential construction projects in Jordan highlighted major factors of time overrun as poor planning and scheduling of the project by the contractor, financial difficulties faced by the contractor, too many change orders from owner, shortage of manpower (skilled, semi-skilled, unskilled labor) and incompetent technical staff assigned to the project. Isah [9] investigating the causes of time overrun in Nigerian construction industry, highlighted that major factors of time overrun are improper planning, lack of communication, design errors and shortage of supply like steel, concrete, slow decision making and Shortage of material. In West bank in Palestine, Mahamid [17] studied construction projects and found 45 factors of time overrun among which major factors are poor communication between construction parties, high competition in bids, payments delay by the owner, financial status of contractor, segmentation of the West Bank, political situation, and lack of equipment efficiency from the perspective view of contractors. Kikwasi [18] investigated the causes of time overrun and disruptions in construction projects in Tanizia through questionnaire survey among contractors, consulting firms, regulatory bodies and clients. The author reported that major factors of time overrun are design changes, delays in payment to contractors, information delays, funding problems, poor project management, compensation issues, disagreement on the valuation of work done and Conflicts among the involved contractors, owners, consultants. These research works are the part of the whole literature review on factors causing time overrun throughout the world in construction projects. Comprehensive Literature review resulted in identifying 30 common factors of time overrun as shown in table 1.

Table 1. Mapping Factors Causing Time Overrun

No	Causes of Time Overrun	Sources
1	Change in the scope of the project	[17] [11] [23] [20]
2	Delay in progress payment by owner	[23] [17], [19] [20] [22]
3	Financial difficulties of owner	[14], [18] [9] [11] [23] [1]
4	Delays in decisions making	[2] [17], [14] [13], [23] [22]
5	Owner interference	[14],[4] [12] [17] [19] [20]
6	Unrealistic contract duration and requirements	[2] [17] [21]
7	Delay in inspection and approval of completed	[2] [17] [14]& [20]
8	Unrealistic contract duration and requirements	[17] [18] [9][23]
9	Frequent design changes	[17] [18] [9] [21] [22]
10	Mistakes and Errors in design	[14] [18] [9] [17], [23] [20]
11	Delay Preparation and approval of drawings	[2] [14] [18] [20] [16] [15]

12	Incomplete design at the time of tender	[17] [18] [9] [23] [20]
13	Inadequate planning and scheduling	[2] [17] [19] [23] [20]
14	Lack of experience	[9] [19] [23] [20] [16] [21]
15	Poor site management and supervision	[2], [14], [17] [4] [19] [23] [20] [16]
16	Incompetent subcontractors	[2] [17] [19] [23] [20]
17	Cash flow and financial difficulties faced by	[17] [19] [23] [20]& [16]
18	Mistakes during construction	[2] [17] [19] [23]
19	Fluctuation of prices of materials	[19] [23] [20]
20	Shortages of materials	[2] [14] [17] [4], [19] [23], [1] [16] [21] [22]
21	Late delivery of materials and equipment	[4] [23] [20]
22	Insufficient Numbers of equipment	[17] [23] [19]
23	labour productivity	[23] [20]
24	Shortage of site workers	[1], [2], [4], [14], [16], [17], [19], [21], [22], [23]
25	Effect of weather	[2] [14] [17] [4] [19] [23] [20]
26	Unforeseen ground condition	[14] [17] [4] &[20]
27	Accidents on site	[4] [23] [19] &[20]
28	Lack of coordination between parties	[2] [14], [17] [4] [19] [23] [20]
29	Lack of communication between parties	[23] [20] [16] [21] [22]
30	Laws and Regulatory Framework	[14] [17] [4] [19] [23] [20]

DATA COLLECTION AND ANALYSIS

In this study quantitative approach was used to understand the perceptions of contractors of Malaysia towards the factors influencing construction time in construction projects. Data collection involved structured questionnaire survey using a questionnaire form prepared based on 30 factors of time overrun identified from literature review. The questionnaires were distributed by post, email and in person among contractors registered in top groups i.e. G6-G7 grade with CIDB, A-B class with PKK (Pusat Khidmat Kontraktor). Measurement of factors of time overrun was carried out using 5-point likert scale from 1 to 5 representing not significant, slightly significant, moderately significant, very significant and extremely significant respectively. Data analysis was done with Statistical Software Package SPSS and using Average Index (AI) method with following formula adopted from Memon et. al. [24]:

$$\text{AI} = \frac{\sum(1X1+2X2+3X3+4X4+5X5)}{\sum(X1+X2+X3+X4+X5)}$$

Where;

X1 = Number of respondents for scale 1

X2 = Number of respondents for scale 2

X3 = Number of respondents for scale 3

X4 = Number of respondents for scale 4

X5 = Number of respondents for scale 5

RESULTS AND DISCUSSION

A total of four hundred (400) questionnaires sets were sent to various construction companies Malaysia. Only, one hundred seventy-five (175) completed sets were received back which analyzed to determine the significant factors causing time overrun. AI value of each factor of time overrun and rank is shown in table 2.

Table 2. Average index value and rank of each factor causing Time Overrun

No.	Factor	Average Index	Rank
1	Frequent design changes	3.38	1
2	Change in the scope of the project	3.34	2
3	Financial difficulties of owner	3.30	3
4	Delays in decisions making	3.28	4
5	Unforeseen ground condition	3.28	5
6	Delay in progress payment by owner	3.25	6
7	Shortage of site workers	3.25	7
8	Mistakes and Errors in design	3.20	8
9	Delay Preparation and approval of drawings	3.20	9
10	Incompetent subcontractors	3.18	10
11	Unrealistic contract duration and requirements imposed	3.17	11
12	Cash flow and financial difficulties faced by contractors	3.17	12
13	Shortages of materials	3.17	13
14	Effect of weather	3.13	14
15	Late delivery of materials and equipment	3.11	15
16	Fluctuation of prices of materials	3.09	16
17	Poor site management and supervision	3.09	17

18	labour productivity	3.08	18
19	Lack of coordination between parties	3.08	19
20	Unrealistic contract duration and requirements imposed	3.06	20
21	Lack of communication between parties	3.06	21
22	Owner interference	3.02	22
23	Delay in inspection and approval of completed works	3.02	23
24	Incomplete design at the time of tender	3.00	24
25	Mistakes during construction	2.99	25
26	Lack of experience	2.98	26
27	Inadequate planning and scheduling	2.96	27
28	Laws and Regulatory Framework	2.94	28
29	Insufficient Numbers of equipment	2.90	29
30	Accidents on site	2.89	30

From table 2 it can be perceived that, 'Frequent design changes' is the most significant factor in affecting time overrun with highest AI value of 3.38. Change in the scope of the project is the 2nd ranked factor, while among other factors financial difficulties of owner, delays in decisions making and unforeseen ground condition are 3rd, 4th and 5th ranked factors. From these results, it can be noted that owner related issues are the important in causing time overrun problem. Hence, for improving time performance, it is very important that the owners need to improve their contract management system.

CONCLUSION

This study investigated time overrun factors in construction industry of Malaysia. It involved survey with questionnaire form consisting of 30 common factors of time overrun. A total of 175 completed questionnaire sets received from contractors were analyzed with average index formula. From the analysis, it was found that the major causative factors contributing to construction time overrun are frequent design changes, change in the scope of the project, financial difficulties of owner, delays in decisions making and unforeseen ground condition.

REFERENCES

[1] Ibrahim, A.R., M.H. Roy, Ahmed, Z., & Imtiaz, G. (2010). An Investigation of the Status of the Malaysian Construction Industry. Benchmarking: An International Journal, 17(2), 294-308

[2] Marzouk, M.M. and T.I. El-Rasas (2014). "Analyzing delay causes in Egyptian construction projects." Journal of Advanced Research 5(1): 49-55.

[3] Memon, A. H., I.A. Rahman, Abdullah, M.R., & Azis, A.A.A. (2011). Time Overrun in Construction Projects from the Perspective of Project Management Consultant (PMC). Journal of Surveying, Construction and Property, 2(1), 54-66

[4] Pai, S.K. and J.R. Bharath (2013). "Analysis of Critical Causes of Delays in Indian Infrastructure Projects." International Journal of Innovative Research and Development 2(3): 251-263.

[5] Endut I.R., Akintoye A and Kelly J. (2009) "Cost and Time Overrun Projects in Malaysia", retrieved August 21, 2009, from http://www.irbnet.de/daten/iconda/CIB10633.pdf

[6] Memon. A.H., I.A. Rahman, A.A. Abdul Azis, S. Nagapan and Q. B. A. Imran Latif (2012). Time and Cost Perfomance in Construction Projects. IEEE Colloquium on Humanities, Science and Engineering Research (CHUSER 2012), held on 3-4 December 2012, Kota Kinabalu, Malaysia

[7] Olawale. Y.A & M. Sun (2010). Cost and time control of construction projects: inhibiting factors and mitigating measures in practice, Construction Management and Economics, 28, 509-526

[8] Pickavance K. Delay and disruption in construction contracts 2nd ed. London, UK: Sweet & Maxwell; 2000.

[9] Isah, K.M.M.A.D. (2012). "Causes of Delay in Nigeria Construction Industry." Interdisciplinary Journal of Contemporary Research in Buisiness 4(2): 785-794.

[10] Gündüz, M., Y. Nielsen, et al. (2012). "Quantification of Delay Factors Using the Relative Importance Index Method for Construction Projects in Turkey." Journal of Management in Engineering 29(2): 133-139.

[11] Danso, H. and J.K. Antwi (2012). "Evaluation of the Factors Influencing Time and Cost Overruns in Telecom Tower Construction in Ghana." Civil & Environmental Research 2(6).

[12] Doloi, H., A. Sawhney, et al. (2012). "Analysing factors affecting delays in Indian construction projects." International Journal of Project Management 30(4): 479-489.

[13] Sanni, A. and M. Hashim (2013). "Assessing the challenges of cost control practices in Nigeria construction industry." Interdisciplinary Journal of Contemporary Research Business 4(9).

[14] Murray, M. and M. Seif (2013). "Causes of Project Delays in Nigerian Construction Industry." European Journal of Civil Engineering and Architecture 10(1): 1-7.

[15] Vidalis, S. and F. Najafi (2002). Cost and time overruns in highway construction. 4th Transportation Speciality Conference of the Canadian Society for Civil Engineering

[16] Sweis, G., R. Sweis, et al. (2008). "Delays in construction projects: The case of Jordan." International Journal of Project Management 26(6): 665-674.

[17] Mahamid, I. (2013). "Common risks affecting time overrun in road construction projects in Palestine: Contractors' perspective." Australasian Journal of Construction Economics and Building, 13(2): 45.

[18] Kikwasi, G. (2013). Causes and effects of delays and disruptions in construction projects in Tanzania. Australasian Journal of Construction Economics and Building-Conference Series.

[19] Abedi, M., Fathi, M.S., & Mohammad, M.F. (2011). Major Causes of Construction Delays Under Client Category and Contractor Category. The First Iranian Students Scientific Conference in Malaysia, 9 & 10 Apr 2011, UPM, Malaysia.

[20] Fugar, F.D., & Agyakwah-Baah, A.B. (2010). Delays in building construction projects in Ghana. Australasian Journal of Construction Economics and Building, 10(1/2), 103-116.

[21] Sadi A. Assaf & Sadiq Al-Hejji (2006). Causes of delay in large construction projects, International journal of project management, 24(4), 349-357.

[22] Chan, D.W., & Kumaraswamy, M.M. (1996). An evaluation of construction time performance in the building industry. Building and Environment, 31(6), 569-578.

[23] Hamzah, N., Khoiry, M.A., Arshada I., Tawil, N.M., & Che Ani, A.I. (2011). Cause of Construction Delay - Theoretical Framework. 2nd International Building Control Conference 2011, Procedia Engineering, 20, 490 – 495.

[24] Memon, A.H., Rahman, I.A., Asmi, A., & Azis, A., 2011. Preliminary Study on Causative Factors Leading To Construction Cost Overrun. International Journal of Sustainable Construction Engineering & Technology, 2(1), 57–71.