A Theoretical Review of the Causes and Effects of Construction Projects Cost and Schedule Overruns

Mukuka M.J, Aigbavboa C.O., and Thwala W.D.

Abstract—This study examines previous literature on construction projects cost and schedule overruns, with the specific aim of identifying the causes and effects of cost schedule overruns in construction projects. This is because the concept of construction projects cost and schedule overruns has attracted much attention in recent years and that researchers and research bodies, be it corporate or government that try to formulate remedies to projects cost and schedule overruns should begin with an understanding of the causes of these overruns and their effects to the construction industry as a whole. The study is conducted with reference to existing theoretical literature, published and unpublished research. The study is mainly a literature review/survey on the causes and effects of construction project cost and schedule overruns. The primary findings emanating from the study revealed that empirical studies have identified a number of important factors which cause projects cost overruns, such as fluctuation of prices of material, cash flow and financial difficulties faced by the contractor, poor site management and supervision, lack of experience and schedule delay. The study further revealed that poor site management, delay in progress payments, poor communication and financial difficulties by the contractor are among the identified causes of construction projects schedule overruns by previous scholars. Literature also revealed that extension of project, additional cost, budget short fall, adversarial relationship between participants of the project, delayed payments to contractors, poor quality workmanship and dissatisfaction by project owners and consequently by end users as the major effects of cost overruns. Furthermore, it was observed that time overrun, cost overrun, arbitration, litigation, disputes and total abandonment of projects were the effects of construction projects schedule overruns. The study explores the causes and effects of construction projects cost and schedule overruns and presents a robust background on the theories of construction project cost and schedule overruns.

Keywords—Cost overruns, Schedule overruns, Construction Industry, Causes and effect of cost and schedule overruns.

Mulenga. Mukuka is an MTech students with the Department of Construction Management and Quantity Surveying, University of Johannesburg, Johannesburg, 2028 South Africa (corresponding author to provide phone:+27 (0) 11 559 6398; fax:+27 (0) 11 559 6630; e-mail: sirjoze2002@gmail.com).

Clinton. Aigbavboa is a Lecture with the Department of Construction Management and Quantity Surveying, University of Johannesburg, Johannesburg, 2028 South Africa (corresponding author to provide phone:+27 (0) 11 559 6398; fax:+27 (0) 11 559 6630; e-mail: caigbavboa@uj.ac.za).

Wellington. Thwala is a Professor with the Department of Construction Management and Quantity Surveying, University of Johannesburg, Johannesburg, 2028 South Africa (corresponding author to provide phone:+27 (0) 11 559 6048; fax:+27 (0) 11 559 6630; e-mail: didibhukut@uj.ac.za).

I. INTRODUCTION

Cost and schedule overruns can occur for a wide variety of reasons on various types of projects which has led to the debate on how to minimise these construction projects cost and schedule overruns [1]. However, Memon, Rahman, Asmi, and Azis, [2] states that in order to find measures of minimising these overruns, the very first and most important step is to identify and understand the factors responsible for the overruns. Hence, this paper examines previous literature on causes and effects of construction projects cost and schedule overruns.

II. CONSTRUCTION PROJECTS COST OVERUNS

Cost overruns are very common in the construction industry. Hardly few projects get completed within original costs [3]. Al-Najjar [4] defines cost overruns as the change in contract amount divided by the original contract award amount. However, Zhu and Lin [5] states that cost overrun can be defined as excess of actual cost over budget. Cost overrun is also sometimes called cost escalation, cost increase or budget overrun. Memon, Rahman and Abdul Azis [2] outlines that cost is among the major considerations throughout the project management life cycle and can be regarded as one of the most important parameters of a project and the driving force of project success. Olawale and Sun [6] states that despite the availability of various control techniques and project control software many construction projects still do not achieve their cost objectives. Hence, despite its proven importance it is not uncommon to see a construction project failing to achieve its objectives within the specified cost [2]. Park and Papadopoulou [7] states that construction cost overruns mean negative publicity for the design team and loss of client confidence. The repercussions for contractors are similar as they see their profit margins shrink.

III. CONSTRUCTION PROJECTS SCHEDULE OVERUNS

Projects or construction works that are not delivered on time to the client are referred to as projects that have undergone schedule overruns. Hence, Mohamad [8] defines schedule overruns as an act or event that extends the time to complete or perform an act under the contract. Also, Assaf and Al-Hejji [9] defined schedule overruns as the time overrun either beyond completion date specified in a contract,
or beyond the date that the parties agreed upon for delivery of a project. It is basically a project slipping over its planned schedule and is considered as common problem in construction projects worldwide. Assaf and Al-Hejji [9] further illustrates that, to the owner, schedule overruns means loss of revenue through lack of production facilities and rentable space or a dependence on present facilities. In some cases, to the contractor, schedule overruns means higher overhead costs because of longer working periods, higher material costs through inflation, and due to labour cost increases. Alkhathami [10] states that schedule overruns can be defined as extra time required to finish a given construction project beyond its original planned duration, whether compensated for or not.

IV. CAUSES OF CONSTRUCTION PROJECTS COST OVERRUNS

Cost overruns do not just occur naturally, there are a number of factors during the construction process that when not managed properly can lead to cost overruns. Al-Najjar [4] identified a total of 42 factors that cause cost overruns and ranked the top ten causes as follows: Technical incompetence, poor organizational structure, and failures of the enterprise, lack of cost reports during construction stage, inadequate project preparation, planning and implementation, delays in issuing information to the contractor during construction stage, lack of coordination at design phase, change in the scope of the project or in Government policies, Some tendering manoeuvres by contractors, such as front-loading of rates, incomplete design at the time of tender, bad allocation of labour inside the site and delays in decisions making by government were ranked the top ten causes of cost overruns.

Eshofonie [11] revealed a total of 40 causes of cost overruns with the top ten causes being the following: cost of materials, incorrect planning, wrong method of estimation, contract management, fluctuation of prices of materials, previous experience of contractor, Absence of construction cost data, Additional cost and Project financing. However, the study of Ameh, Soyingbe and Odusami [12] identified factors that cause of cost overruns, these factors were then categorised in 5 categories namely: environmental factors, construction factors, construction Item Factors such as frequent design changes, Cost estimating factors and financing factors. Baloyi and Bekker [13] revealed that increase in material cost, inaccurate material estimates, shortage of skilled labour, client’s late contract award, project complexity, increase in labour cost, inaccurate quantity take-off, difference between selected bid and the consultants’ estimate, change orders by client during construction and shortage of manpower.

Rahman, Memon and Abd. Karim [14] identified the following as the top ten causes of cost overruns in large construction projects: fluctuation of prices of material, cash flow and financial difficulties faced by the contractor, poor site management and supervision, lack of experience, schedule delay, inadequate planning and scheduling, incompetent subcontractors, mistakes and errors in design, frequent design changes and poor financial control on site. These results were not in agreement with the results of Memon el al [15] where poor design and delays in design, unrealistic contract duration and requirements imposed, lack of experience, late delivery of materials and equipment, relationship between management and labour, delay in preparation and approval of drawings, inadequate planning and scheduling, poor site management and supervision, mistakes during construction and changes in material specification and type were identified as the top causes of cost overruns. Kasimu [16] identified five categories of causes of cost overruns which include: financial related factors, factors related to construction parties, factors related to construction items, environmental related factors and politics related factors.

V. CAUSES OF CONSTRUCTION PROJECTS SCHEDULE OVERRUNS

Causes of schedule overruns are factors that lead to construction projects not being finished according to the planned scheduled time at the inception of project. Ade-ojo and Babalola [17] states that there are 6 major causes that would lead to schedule overruns, the identified causes were ranked as follows: design error, poor site condition, delay in payment, financial incapability of client, financial incapability of contractor and non-availability of subcontractor and supplier. Further, Akinsiku and Akinsulire [18] show that, financial or cash flow difficulties, financial difficulties faced by contractors and public agencies, frequent change order and design, failure to pay for completed works, shortages of resources, considerable additional work, escalations of material prices, increases in the scope of work, delay in design work and late delivery of materials are the top ten causes of schedule overruns on construction projects.

However, Ali, Smith, Pitt and Choon [19] shows that labour Shortage, contractor’s financial difficulties, construction mistakes and defective works, coordination problem, material shortage and poor Site management are the major factors that contribute to schedule overruns on construction projects in Malaysia. Furthermore, Memon et al. [20] revealed that design and documentation issues, financial resource management, project management and contract administration, contractors site management, information and communication technology, material and machinery resource, labour (human) resource and external factors as the major factors affecting time performance on construction projects. The study of Pourrostam and Ismail [21] shows the following as the top ten causes of schedule overruns: poor site management, delay in progress payments by client, change orders by client during construction, ineffective planning and scheduling of project by contractor, financial difficulties by contractor, slowness in decision making process by client, delays in producing design documents, late in reviewing and approving design documents by client, poor contract management by consultant and problems with subcontractors.
VI. EFFECTS OF COST OVERRUNS

Effects are the consequences that will be encountered when cost overruns occur on a construction project. Nega [22] states that cost overruns have obvious effects for the key stakeholders in particular, and on the construction industry in general. To the client, cost overrun implies added costs over and above those initially agreed upon at the onset, resulting in less returns on investment. To the end user, the added costs are passed on as higher rental or lease costs or prices. To the professionals, cost overrun implies inability to deliver value for money and could well tarnish their reputations and result in loss of confidence reposed in them by clients. To the contractor, it implies loss of profit for non-completion, and defamation that could jeopardize his or her chances of winning further jobs, if at fault. To the industry as a whole, cost overruns could bring about project abandonment and a drop in building activities, bad reputation, and inability to secure project finance or securing it at higher costs due to added risks [22].

The study of Nega [22] further identified the following as the major effects of cost overruns: delays during construction, supplementary agreement, additional cost, budget short fall, adversarial relationship between participants of the project, loss of reputation to the consultant, the consultant will be viewed as incompetent by project owners, high cost of supervision and contract administration for consultants, delayed payments to contractors, the contractor will suffer from budget short fall of the client and poor quality workmanship. However, Eshofonie [11] identifies four effects of cost overruns as follows: company or firm liability to insolvency and liability of the company or firms to bad debt, under-utilization of man-power resources, plants and equipment, increased project cost due to extension of time: Longer project duration means that more resources will need to be allocated to the project, which then increases the project costs and project abandonment.

VII. EFFECTS OF SCHEDULE OVERRUNS

Effects of schedule overruns are the consequences that will occur when the causes of these schedule overruns are not identified and worked on effectively. The study of Pourrostam and Ismail [21] identifies and ranks the effects of construction delays as follows, time overrun, cost overrun, dispute, arbitration, litigation, and total abandonment of projects. These findings are in general agreement with other studies as carried out by Aibinu and Jagboro [23] and Motaleb and Kishk [24]. However, the study of Baki [25] brings in the aspect of claims as one of the effects of delays in construction projects.

VIII. RESEARCH METHODOLOGY

The research was conducted with reference to existing theoretical literature, published and unpublished literatures. The study is mainly a literature survey/review and looks at the literatures relating to construction project cost and schedule overruns. This is because the concept of projects cost and schedule overruns has attracted much attention in recent years and that researchers and research bodies, be it corporate or government that try to formulate remedies to construction projects cost and schedule overruns should begin with an understanding of the causes and their effects. The current methodology falls within the qualitative research methodology.

IX. LESSONS LEARNT FROM LITERATURE REVIEW

Literature reviewed showed that the major causes of cost overruns include: cost of materials, incorrect planning, wrong method of estimation, contract management, and fluctuation of prices of materials [11]. Other causes identified through literature include, environmental factors, construction factors, construction Item Factors such as frequent design changes, Cost estimating factors and financing factors [12]. Furthermore, literature showed that the major causes of schedule overruns include: design error, poor site condition, delay in payment, financial incapability of client, financial incapability of contractor and non-availability of subcontractor and supplier [17]. Other causes of schedule overruns included: financial or cash flow difficulties, financial difficulties faced by contractors and public agencies, frequent change order and design, failure to pay for completed works, shortages of resources, considerable additional work, escalations of material prices, increases in the scope of work, delay in design work and late delivery of materials [18].

Literature further identified the following as the major effects of cost overruns, delays during construction, supplementary agreement, additional cost, budget short fall, adversarial relationship between participants of the project, loss of reputation to the consultant, the consultant will be viewed as incompetent by project owners, high cost of supervision and contract administration for consultants, delayed payments to contractors, the contractor will suffer from budget short fall of the client and poor quality workmanship [22]. Furthermore, literature showed the major effects of schedule overruns to be time overrun, cost overrun, dispute, arbitration, litigation, and total abandonment of projects [21].

X. CONCLUSION

This article has examined literature relating to construction project cost and schedule overruns. Literature review showed that the causes of cost and schedule overruns range from those caused by poor construction management to those that are caused by other external factors like poor weather conditions. Further, literature revealed that there are corresponding negative effects of construction project cost and schedule overruns that can eventually lead to total project abandonment.

REFERENCES


Mohamad, M.R.B. 2010, The factors and effect of delay in government construction project: Case study in kuantan: University Malaysia Pahang


