Overruns Again in Public Projects: Perspective from Northern Cape, South Africa

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Abstract

Despite the proliferation in time and cost overrun studies, public sector projects are still prone to both phenomena in South Africa. Thus, this paper is based on a research that attempt to clarify the major causes of time and cost overruns in a major public sector project in the Northern Cape Province of South Africa. The effect and frequency of the overruns were investigated with a case study research design in which data collection was done through face-to-face interviews. The study shows that the major causes of time delays in the case project in the Northern Cape are a lack of knowledge by clients and technical skills and a lack of experience amongst contractors. The major causes of cost overruns include material price escalations, which are often underpinned by poor construction planning. These overruns have therefore contributed to socio-economic upheaval in the province as evident in numerous service delivery unrests in local communities. On more than one occasion, the case project was abandoned by contractors due to problems that contributed to the overruns. It was important that the client improves internal processes and prioritize proper allocation of funds for the project.

Keywords: construction, cost, projects, public sector, South Africa

Introduction

The contribution of the construction industry to Gross domestic product (GDP) provides an indication of the importance of the sector. The inability of the project team to have a comprehensive overview of the construction process from inception to completion is likely to be the reason for the non-realization of projected delivery date (Aiyetan and Smallwood, 2010). There is great concern for delays and cost overruns in public sector construction as most projects are executed with public funds. The funding for construction activities is used to regulate the economy in many countries. As the construction industry continues to grow in size, so do planning and budgeting problems. It is now common for projects not to be completed on time and within the initial budget (Apolot, Alinaitwe and Tindwesi, 2013). A pressing concern is however the rate of project overruns (cost and time) of both economic and social infrastructure projects in most developing countries (Omoregie and Radford, 2006).

The management dilemma created by time delays and cost overruns is lack of productivity, idling equipment, standing time and a frustrated work force. According to Kikwasi (2012), delays and disruptions are among the challenges faced in the course of executing construction projects in sub-Sahara Africa. Delays thus constitute sources of

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potential risks that must be managed by paying attention to the technical, social, economic, legal, financial, resource, and commercial aspects of a construction project. Therefore reducing time delays and cost overruns is crucial for building a more effective and productive construction industry. Given the underlying socio-economic impact of delayed infrastructure and the trend in service delivery unrest in South Africa, a case project was examined through an exploratory study in a major province in South Africa. The overall aim of the study is to assess events that contribute to both cost and time overruns in the construction sector so that context specific suggestions can be made to policy makers in the province.

Major Causes of Time Overrun

The Latham report (1994) affirms that timely delivery of projects is important to clients of the construction industry. The five most important causes of delays in construction projects were found to be change in scope of work to be done, delayed payments, poor monitoring and control, high cost of capital and political instability (Apolot et al,. 2013). Findings reveal that the main causes of time delays pertain to design changes, contractor payments, information gaps, finance, poor project management, compensation issues and disagreement on the valuation of work done (Kikwasi 2012).

According to Aiyetan (2010), time delays in construction may result from the extent to which the client understands a design, procurement method, and the coordination of the work to be done. Ameh and Osegbo (2011) concluded that the biggest contributors to time overrun is inadequate funding for the projects, inadequate planning of project before take-off, absence of required tools and equipment, delay in delivery of materials, subcontractors' incompetency and design changes.

Afshari et al. (2011) evaluate non-excusable causes of delays in a company in Hong Kong, and note that the main causes of delays entail the selection of incompetent subcontractors, poor management of the project changes, Lack of mechanism for recording, analysing and transferring project lessons learned. Another study conclude that the paucity of funds, rapid market fluctuations, hegemony of market players, ineffectiveness of site management, delay in site mobilization, lack of the modern design software, delay in approvals of shop drawings and frequent changes during execution, and lack of involvement of client in planning, could lead to various forms of delays (Nawaz, Ikram, and Qureshi 2013). Furthermore, Ramanathan et al. (2012) say that the main causes of time delays are slow payment for completed works, contractor financial difficulties, cash problems during construction, inflation and financial difficulties to owner. The quality of management during construction such as the level of supervision, activity sequencing and ineffective coordination of resources also negatively affects the completion time of projects. Physical environmental conditions such as rainfall and varying temperatures negatively affect delivery time of projects (Aiyetan, Smallwood & Shakantu 2012). Material shortages and late delivery, poor site management, design changes and poor planning seemed to be major time delay factors in South Africa (Baloyi and Bekker 2011).

Major Causes of Cost Overrun

The study of 258 transport projects by Flybjerg (2004) in five continents deduced that nine out of ten projects assessed were having cost overrun. Furthermore, Flybjerg note that the longer the project took and if it was a mega project, the cost escalation will increase by 4.64% every passing year from decision to build until operations. At 14%, a study by Omoregie and Radford (2006) establishes the minimum percentage escalation cost of projects in Nigeria. The approximate minimum mean percentage escalation period of project in Nigeria from this study was 188%. In spite of these severe loses, the mean average percentage completion

of work was 96% (Omoregie and Radford, 2006). The literature review indicated that the most significant contributing factors causing cost overruns on global projects were changes in material prices, changes to work or additional work and time delays. The findings from the FIFA World Cup stadia in South Africa also indicated material cost as the largest contributor to cost overruns with inaccurate material estimates and shortage of skills ranked second and third in contribution (Baloyi and Bekker 2011). Similarly, another industry findings show that wrong perceptions of time exist within project teams, and this perceptions in turn impact on the cost and quality performance of a project (Bowen et al. 2002).

On the global stage, many infrastructure projects have run into diverse forms of overruns. For example, Dutch rail projects perform considerably better, with projects having significantly lower percentage cost overruns in real terms (11%) compared to projects in other North West (NW) European countries (27%) and in other geographical areas (44%). Bridge projects also have considerably smaller cost overruns – 7% in the Netherlands compared with 45% in other NW European countries and 27% in other geographical areas (Cantarelli et al., 2012). The findings reveal a discrepancy between estimated and actual costs, with a mean cost overrun of 7.9% ranging from 259% to 183%. One particular finding that has not been shown before in previous studies is that cost overruns appear to be more predominant among smaller projects as compared to larger ones. This observation, for the Norwegian road sector in particular, leads to the proposition that cost savings lies in exerting pressure on smaller projects. Other factors found to influence the size of cost overruns include completion time of the projects and the regions where projects are situated (Odeck, 2004). The empirical analysis found the change in scope of work on site, incomplete design at the time of tender, contractual claims (extension of time with cost), lack of cost planning and monitoring of funds, and delays in costing variations and additional works as important overrun factors in South Africa (Ramabodu and Verster 2013). The study of Prinsloo, Kasese and Hoffman (2011) has shown that time and cost overruns are a real problem in the Botswana local authorities. Leading causes being inefficient contractor's management, low productivity of contractor's workforce, low productivity of contractor's equipment, client's responsibility, and design errors by consultants as being the highest ranked causes.

Effects of Time and Cost Overrun

One effect of cost overrun in major projects is the suffering for lack of public services. According to Nega (2008), cost overruns have devastating implications to clients in terms of return on investments. In this context, it means that costs are passed on to clients, if the investment will be on a lease of property. In a about the effects of variation orders on construction projects, Osman, Omran and Foo (2009) contend that the increase to project cost was significant. Cost and time overruns have relative effects on each other. For example, a study that was concluded in the Malaysia shows how time overrun on a project became a compounded problem through associated cost implications (Sambasivan and Soon, 2007).

Research Methodology

A single case research design was used for this study. Interviews form the primary collection method for the study. Primary data was collected through semi structured interviews conducted on a case study of one major project executed in the Northern Cape Province of South Africa. The interviews were at least 30 minutes to an hour long. The questions were open ended to establish rapport with potential participants and therefore gain their cooperation. According to Leedy and Ormrod (2010), such interviews yield the highest response rates. Clissett (2008) in Tavallaei and Abu Talib (2010) says that qualitative

research explores human experience, perceptions, motivations and behaviours and is concerned with the collection and analysis of words whether in the form of speech or writing.

Therefore; a researcher who uses qualitative research for his or her research work when an issue under study needs to be comprehended in a complex and detailed level. As for the process in qualitative research method, the researcher inevitably dives deep into the phenomenon under study. In this particular study, the researcher interviewed clients, consultants and contractors in order to understand their perception and experience of time delays and cost overruns in the Northern Cape Province of South Africa. The questions were set in a logical pattern to enable ease of interviewees understanding and response. The resulting data were analysed by transcribing the recorded interviews from a recording device to a word document. The interview sample comprised of: two senior Quantity Surveyors, one clerk of works, one civil engineering technician, one regional manager from department of publics works, two project managers, and one director of infrastructure from government, one contracts manager, and one senior foreman. Selection mode for the sampling of the study was purposive, to yield the most information about the topic under investigation and also because of time constraints. All the interviewees have extensive public works experience in the province.

The study conducted nine interviews. Although small in statistical terms, the number of interviewees is sufficient for analysis as Leedy and Ormrod (2010: 141) confirm that "a typical sample size is from 5 to 25 individuals".

Findings and Discussion

Major Causes of Time Delays in Northern Cape, South Africa

Most respondents agree that technical skill / skilled labour and the lack of experience linked to contractors leads to time delays; some respondents opine that lack of management skills and financial skills also contribute to time delays. Even though some of the interviewees mention that the shortage of technical skills in the province is a contributor to time delays; they say that the cause of this is the fact that fund allocation for projects are often inappropriate. In fact, some of the interviewees view the appointment of incompetent / inexperienced contractors as well as political interference, especially corruption in the appointment of contractors, as contributing factors to time delays as the contractor cannot complete the work in the stipulated time due to their lack of resources at the time of their appointment. A related problem raised by two interviewees pertain to late payments for contractors, and the lack of construction intelligence among public sector clients shown through poor planning by the client through an unclear scope, design changes by the consultants and poor design co-ordination amongst the consultants.

Effects of Time Overrun in Northern Cape, South Africa

Most of the interviewees (7) state that cost overruns lead to time delays because if time extension is granted; additional Preliminaries & Generals are also granted to the main contractors as well as his subcontractors. Contract Price Adjustment Provision will also be applicable due to inflation and other external factors and consultation fees which have to be spent by the client. Social loss experienced by potential end users is a major effect of time overruns mentioned by five interviewees as most government building projects are undertaken to address certain needs within the community. This is because the commencement of building projects creates a certain expectation within the community and when construction projects are delayed, communities demand to know why this occurs and who is at fault. This social loss then results into community unrest as mentioned by the interviewees. Another effect mentioned by two interviewees was constant loss of

employment due either project suspension or abandonment by contractors when penalties are induced upon them. Interviewee number 5 even laid emphasis on mistrust and unease amongst the project participants as a major by-product of time delays. Loss of morale, audit queries, unnecessary expenses, non-payment of contractors by the client and penalties were also effects of time delays on construction projects according to the interviewees.

Major Causes of Cost Overrun in Northern Cape, South Africa

According to three interviewees, poor planning during the design stages is one of the major causes of cost overruns as this results in an unclear scope of work, vague design brief, insufficient time for design co-ordination, change in the scope of works, variation orders and fast tracking of projects. The interviewees say that late design information is a contributing factor to cost overruns. They say that time overruns leads to cost overruns and is caused by rework due to poor workmanship, extension of time claims, loss and expense claims from the contractor and an increase in the consultation fees. Another three interviewees were of the opinion that material escalation due to time overruns and inflation tend to increase the contract price claims, especially where extension of time is approved. Interviewees' number 4 and 9 said that the client's choices to appoint in capable contractors and consultants were also a contributing cause to cost overruns. Interviewees 6 and 9 state that incapable contractors and consultants contribute to time overruns due to lack of experience in the project in which they are appointed for, as well as the lack of capacity, both human resource and finance. Interviewees number 10 and 3 mentions that corrupt practices by government officials during procurement of consultants and contractors as well as lack of client knowledge are also causes of cost overruns. This may also be contributing factors to the appointment of incapable consultants and contractor.

Effects of Cost Overrun in Northern Cape, South Africa

There are many effects of cost overrun. But four interviewees mention that abandonment of the site by contractors is the commonest in the Northern Cape Province. Interviewee number 7 and 10 mention that this is spurred by the fact that if projects overrun on costs, the client does not have additional funds for the project. As soon as the fund dries up, the contractor leaves the site to work on projects that have the necessary funds. This effect of non-payment by the client is mentioned by two interviewees. This further leads to legal fees in the form of litigation once the contractor has abandoned the site according to interviewee number 1 and 3. Interviewee number 1 and 5 further state that audit queries are effects of cost overruns, particularly in the case where there are legal implications. One of the effects of cost overruns mentioned by interviewee number 8 is contractor bankruptcy. Bankruptcy leads to the loss of work, especially among the people in the host communities. Interviewee 5 mentions the social effects of cost overrun, which are very difficult to quantify. These include the public's negative perception of all the companies and individuals that are working on a particular project as well as a negative perception of the construction industry. According to the interviewees, an estimated 65% of public construction projects experience time delays and cost overruns in the province. A further evidence of the severity of the time and cost overrun was through a mega project constructed in the Northern Cape, which is used as a case study in the next section.

Case Study Discussion: New Kimberley Mental Health Hospital

The Department of Public Works (DPW) in Northern Cape awarded the tender for the building project shown in Figure 1 in 2003 at a cost of R250 million. The duration was 4 years, which was supposed to be completed in 2007. However, at the time of writing this

paper, the project is at the moment between 60% and 70% complete – 12 years gap. The first main contractor abandoned the project citing non-payment by the client. There were several structural defects, which lead to the client refusing payment to the contractor before such defects were fixed by the contractor. In the end, the contractor ended up liquidated. This resulted in an investigation set up by the Standing Committee on Public Accounts (SCOPA, 2013). The new contractor was appointed 28th November 2011 for a duration of a 2 years at an additional cost of R290 million. The contractor gained possession of the site on the 21 December 2011. The date of practical completion was 27 November 2013. Initially, the date of practical completion was revised to 4 March 2014 after an audit of the existing structure and the cost came to an added R39 million for contract price adjustment (SCOPA 2013).

Figure 1: New Mental Health Hospital in Kimberley source: www.mg.co.za

The user Department initiated changes to the design of several buildings. An instruction to cease all internal construction on several buildings on the critical path was issued to the Contractor on 5 Feb 2013. This was followed with amended drawings issued on 22 July 2013. The contractor claimed for extension of time for practical completion to 20 August 2014. The issued drawings indicate demolitions of some internal walls and associated infrastructure. This was succeeded by rebuilding of some internal walls and associated infrastructure. The contractor notified the principal agent of his intension to claim for a further extension of time for practical completion due to such demolition and rebuilding on the critical path. A further claim for extension of time for practical completion is expected due to the current progress on the project. Progress on the completion of the partially completed new mental health facility and construction of a new gate house is as follows (new contract) - Progress to Date as at 2013 report: 29.4% (Certificate No: 22: end of September 2013); and Overall Completion: Approximately 55% (SCOPA 2013). A comparison between the planned cash flow (at contract award) and the actual cash flow (simplified as straight line graphs) is illustrated below:

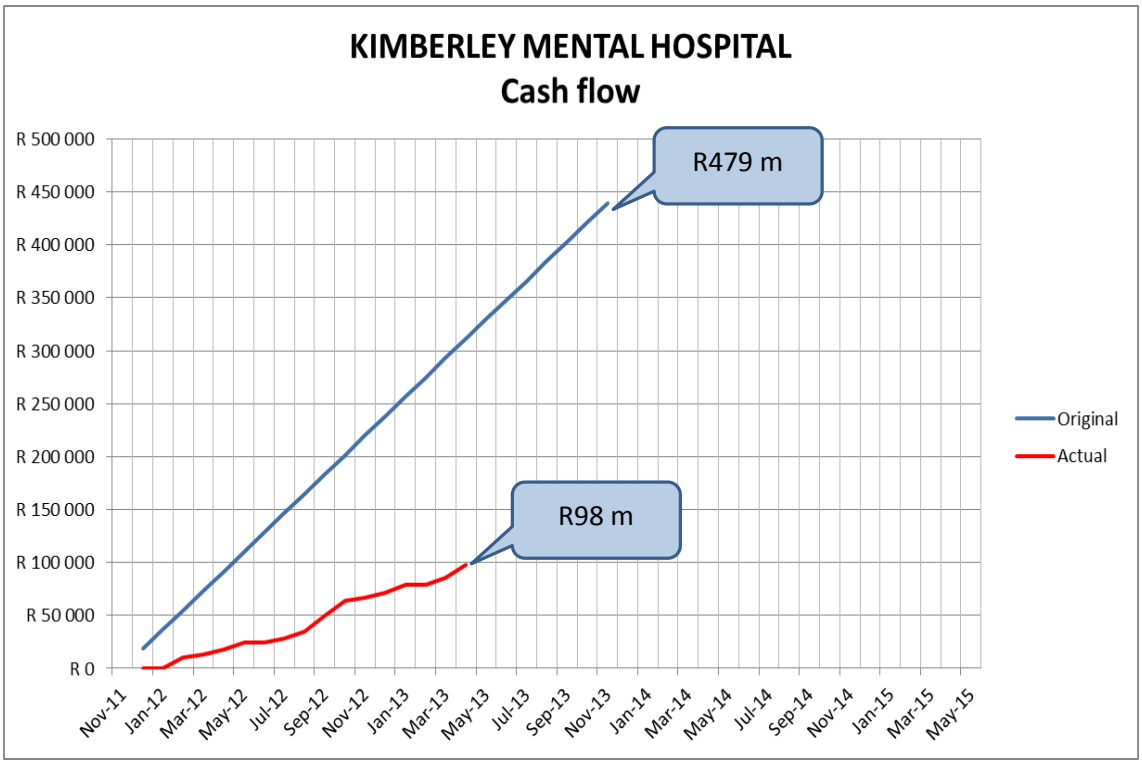

Figure 2: Cash flow comparison on case project source: SCOPA 2013

It is clear that the actual progress on site is far below the planned progress. It is highly unlikely that the Contractor will make up the difference. The impact of the approved and expected extensions of time for practical completion results in a more realistic cash flow for future work. The following observations suggest that the contractor may indeed complete this contract:

- New contract management team (experienced);
- More positive attitude towards project, and
- Improvement in quality of work.

However, observations suggest that the contractor may fail to complete this contract on time. First, the available workforce to the contractor is limited in capacity; the main subcontractor on the project has left the site; there are disputes around the appointment of selected subcontractors, and limited cash is available to finance the works (SCOPA, 2013)

This project has highlighted several deficiencies in the management approach. Some of the major lessons learned emphasise the need to finalize designs prior to contract award, if the traditional procurement method is the preferred method for a project. In addition, since major changes during construction are disruptive and expensive, proactive project management is essential on any large multi-disciplinary project. The full time attention of an experienced principal agent is important; and the clear allocation of responsibility for overall project management on behalf of each role player is critical. The appointment of appropriate service providers has been highlighted in the case project and the interviews. It is imperative that nepotism is not allowed in the appointment of service providers so that disappointments would be avoided.

Contextual Contributions of this Research

Public sector budget allocation in South Africa is a complicated process that tends to be long due to the so called 'red tapes' in the system. For instance, the Department of National Treasury coordinates intergovernmental financial relations, manages the budget preparation process and exercises control over the implementation of the annual national budget, including any adjustments budgets. After the national budget has been published, it will now be voted for in parliament before being distributed to 9 different provincial treasury departments and national departments. Thereafter the provincial member of executive councils of finance of 9 different provinces will now table how the budgets will be divided between their different provincial departments in their provinces according to how the finance minister has made allocations to the provincial departments of treasury.

This process has had a huge impact on the status quo of the case project. This budgetary problem is made worse through the limited capacity in clients' departments in South Africa in terms of both project and construction management (Emuze and Smallwood, 2011; Rwelamila, 2007). According to one of the interviewees, political interference and corruption in the appointment of contractors are majorly contributing to time delays as the contractor cannot complete the work in the stipulated time due to financial interest from politicians thus causing these client delays which will attract preliminary and general with compensation and this finding is corroborated by (Aibinu and Jagboro 2002). Three of the respondents cited time overrun as a major cause of cost overrun and is caused by shortage of skilled artisans in South Africa thereby leading to poor workmanship and rework by the contractor the finding is confirmed by (Love and Singh 2012). In addition, two of the interviews mention that corruption of government officials during the procurement of consultants and contractors as well as lack of knowledge are also causes of cost overrun.

Conclusion

The study highlights the relations between time and cost overrun in public sector projects executed in the Northern Cape province of South Africa. Furthermore, the effects of both time and cost overrun were investigated to flag their pervasiveness. The study points to the lack of technical skills, and the appointment of ill qualified contractors as major hurdles that must be overcome in the province, if projects are to be completed within agreed terms. The province seems to have political interference on construction jobs and that in turn leads to the appointment of incompetent and inexperienced contractors on projects. Such appointments leads to poor planning, enormous design changes, and poor design co-ordination by consultants, which in turn, contributes excessive revisions of practical completion dates, and this has been shown by the case study projects in terms of time overrun.

The Northern Cape Province is a small province in terms of economic activities and a large province in term of land mass in South Africa. The construction industry in the province depends a lot on the public sector for survival. So if a major project, such as the Kimberley Mental health Hospital, is riddled with problems that are seemingly upstream and downstream, the socio-economic life in the province is strongly affected.

It is therefore important to avoid both cost and time overruns in public sector projects in the province. The interventions that can be best deployed to reduce time delays and cost overruns are improved procurement processes in the government Departments. This is critical as government needs to ensure that they define the minimum requirements early and clearly before committing consultants and contractors. Proper internal audit processes must be put in place to ensure that procurement processes aim to add value. The study is exploratory and it has limitations in terms of generalisation beyond the province. However, similar projects in South Africa provinces will do better, if the storyboard provided in this paper is seen as a warning sign for a change. One of the respondents say that the major cause

of delay is the fact that fund allocation for projects is not properly done and needs to be re-appropriated. Long process of budget allocation creates systemic problems for capital projects. The mode of allocation must be addressed.

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