

Supply Chain Management Challenges on Construction Projects in South Africa

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Abstract

This study is aimed at investigating public sector clients' performance in the South African construction projects with a view to establishing the supply chain management (SCM) challenges during procurement processes. A qualitative and quantitative mixed method research design was adopted in carrying out the study. This involved the use of interviews, structured and open-ended questionnaires. Data were collected from South African National and Provincial Departments of Public Works as public sector client representatives. The purposive sampling technique was adopted for the study. Data collected were analysed using content analysis to determine the themes and constructs leading to the identification of public sector clients' key performance indicators. Further analysis was carried out using mean ranking analysis of factors associated with the strengths and weaknesses associated with public sector clients' performance. Results show insufficient SCM cadres, procurement challenges, long SCM processes, contractual inequality, and lack of internal control measures in Public Finance Management Act (PFMA). Others are; lack of skilled service providers, undefined service providers' roles, unclear project specification and weak procurement strategies. Implementable recommendations were made to specific user departments. The SCM units in the South African National and Provincial Departments of Public Works should adopt the recommendation suggested in this study.

Keywords: Challenges, Client, Construction Procurement, South Africa, Supply Chain Management

INTRODUCTION

The South African construction industry plays an important role in the overall improvement of the country's infrastructure at large. In construction projects, there are processes and activities that are carried out to ensure that the outcomes of these projects satisfy construction clients. These are complex processes as the client and the rest of the supply and project chains must be in agreement for the delivery of these projects. However, research indicates that at the end of these projects, clients show dissatisfaction with the performance of the supply chain management units in the National and Provincial; Departments of Public Works (CIDB, 2015). Furthermore, the challenges associated with supply chain management units' performance (i.e. effectiveness and efficiency in their roles) in the South African context in these processes and activities have not been adequately investigated (Hanson, 2006; CIDB, 2015; CIDB, 2016). Therefore, this study investigates the performance of supply chain management units in the South African National and Provincial Departments of Public Works with a view to establishing the supply chain management challenges to improving the efficiency and effectiveness during procurement processes.

It is important to realise that the responsibility and obligation of the construction clients in the supply chain management units is paramount during the procurement process and is essential because of the responsibility of selecting the contract and procurement strategies (Mohsini and

Botros, 1990). It is the responsibility of the construction professionals in the supply chain management units to understand the characteristics of the project (Ambrose and Tucker, 2000) and also to be familiar with the external factors arising from the construction environment (Alhamzi and McCaffer, 2000).

Drawing from the foregoing suggests that the performance of the supply chain management units is crucial in the public sector procurement for current and future development of the South African construction industry. It is essential, therefore, to measure the supply chain management units' performance in construction projects to determine whether planned improvements in the efficiency and quality of facilities are being achieved, and to learn lessons for future projects (Egbu and Ilozor, 2007).

Improving supply chain management units performance requires more than learning from the client's own perspective; it includes learning from the experiences of others (Egbu and Ilozor, 2007). It is therefore important that the supply chain management units' performance in procuring construction projects is studied carefully and systematically. The knowledge and awareness of the supply chain management units effectiveness and efficiency in the stated areas in the public sector procurement is crucial for this study. It then becomes important to advance the knowledge of construction procurement that would consequently improve the overall construction procurement processes and outcomes (Hanson, 2006).

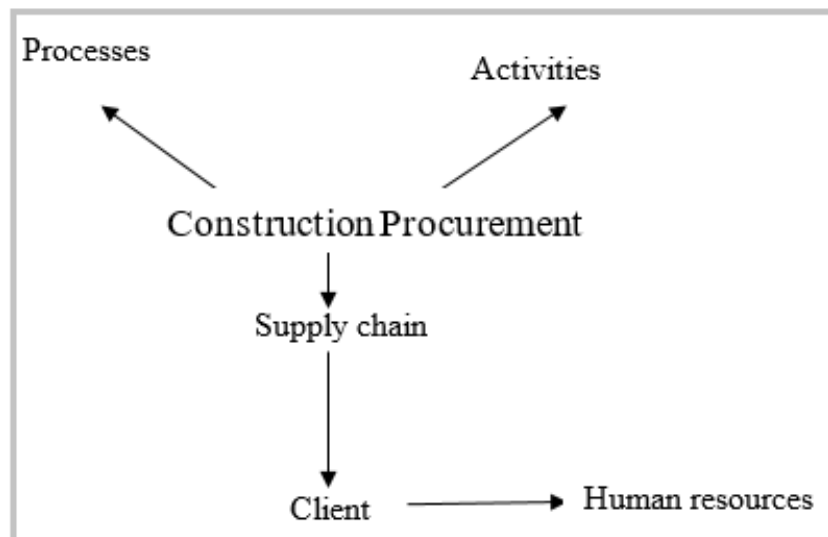


Figure 1: Concept of construction procurement

The construction projects may be defined as the management of upstream and downstream relationships involving clients and other project partners in order to achieve greater project value at lesser cost (Rimmer, 2009, p.138). Therefore, the application of supply chain management in construction procurement offers opportunity for improvement of the construction process. This section situates the present study in the literature and theory related to construction procurement and the role of public sector clients in the construction procurement process. This is to surface the nature and concepts of performance improvement in public sector client organisations in construction procurement (see Figure 1).

However, construction is driven by the supply chain, is one of the most vital stakeholders in the chain. As opined by Ofori (1990), the supply chain is called by many names, such as, the initiator of the construction process, the individual or group financing the project, the building

owner (used by some practitioners and often in legislation), the employer (used in contract documents) and the developer (usually used to refer to those building for sale or letting on a speculative basis). Similarly, it varies in size, interests and motivation and are therefore classified into four groups: public sector clients, private occupiers, property companies, and investors (Ofori, 1990).

Consequently, the change in the supply chain body has been identified by Newcombe (1994) as a move from an individual to a corporation, from a unitary body or single person to a series of stakeholders. However, the supply chain is certainly not a unitary body and may take the nature of a multi-organisation. The multi-organisation may be temporary or permanent; therefore, understanding the nature of the supply chain in this context and the legal, contractual and organisational obligations of the supply chain is an important aspect of the procurement system (Rowlinson and McDermott, 1999).

The public sector's aim is for public accountability in the design and procurement of goods and services in the administration of projects which endeavour to provide value for money for tax payers. Public sector projects range from purely social projects to those meant to earn a profit and the purposes for which they are built (Ofori, 1990). In terms of supply chain management units' expectations, it is essential that the supply chain management units' priorities, such as cost, time and quality are set out and should be achieved at the end of the project (Rowlinson and McDermott, 1999). The supply chain management units' also need to identify those elements of the procurement processes which will bring about performance which matches their objectives (Morledge, Smith and Kashiwagi, 2006). Furthermore, More emphasis on the strategic phase of the project processes, as emphasised by Chandler's (1966) axiom of 'structure follows strategy,' is the key to organisational design in the procurement processes.

The effectiveness and efficiency of the supply chain management units during the delivery processes, however, needs to be measured from procurement outcomes to know whether they are achieving continuous improvements or not. The major reason why an organisation needs to measure its performance is to know whether the organisational objectives or goals are met. The procurement outcomes are measured by key performance indicators (KPIs) (KPI Working Group, 2000). Project outcomes are measured using the clients' KPIs. The roles and duties of the supply chain management units' pre-construction stage, construction stage, and to handing over stage are measured and analysed to come up with client weaknesses and strengths during the procurement processes.

The Procurement Framework in the South African Construction Industry

The South African Constitution (Act 108 of 1996) stipulates the primary and secondary aims of the South African public sector procurement system. The alignment of the CIDB Construction Procurement requirements with the MFMA and PFMA is shown in Figure 2.

In Act 38 of 2000 are procurement objectives, provisions, stipulations of requirements for the lawful and fair awarding of contracts and policy for preferencing. In tandem with the provisions of the Constitution, the legal framework for procurement is further stipulated in a number of Acts of Parliament (CIDB, 2016). More specifically, the construction procurement is subsumed under the Construction Industry Development Board Act (Act 38 of 2000).

Fairness, equity, transparency, competitiveness, and cost effectiveness of the procurement system are requirements from the South African legislative framework. The National Treasury

through the Public Finance Management Act (PFMA) of 1999, and the Local Government: Municipal Finance Management Act (MFMA) of 2003 regulates procurement in South Africa. Therefore, the guideline approach informs all public sector procurement in South Africa. The Construction Industry Development Board (CIDB) and the CIDB Standard for Uniformity in Construction Procurement, nevertheless regulate construction procurement.

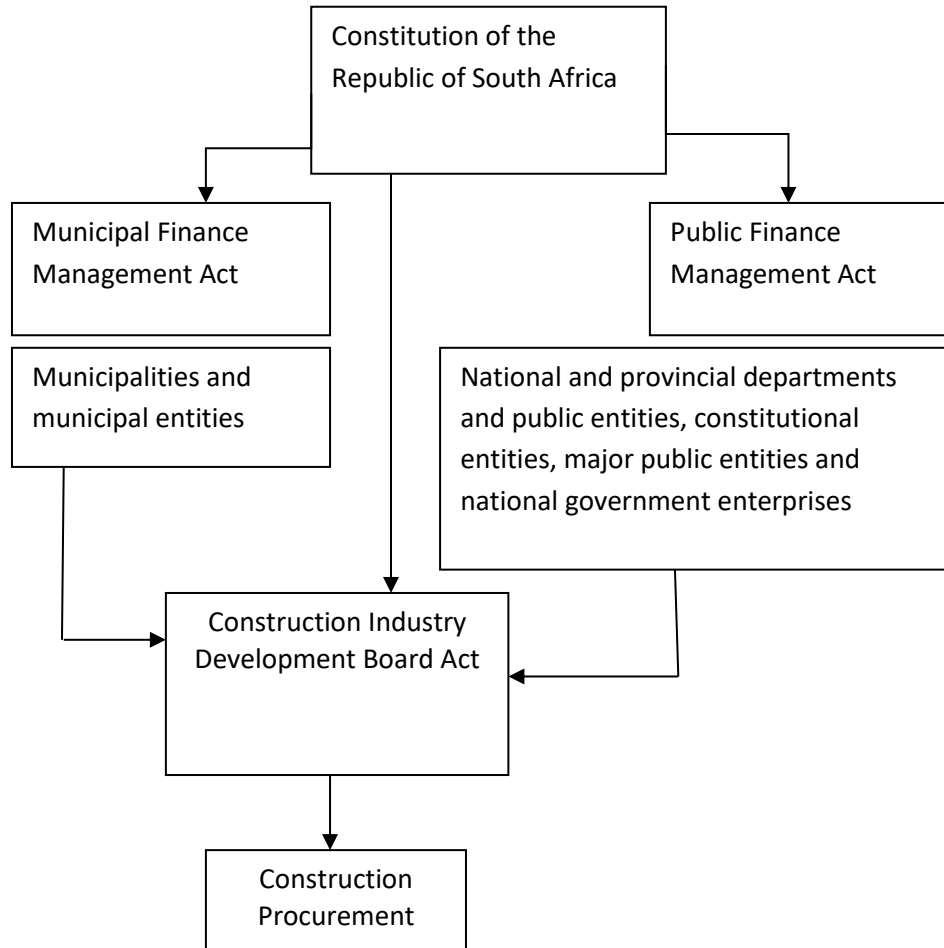


Figure 2: Alignment of PFMA, MFMA and CIDB Act (Adapted from CIDB, 2016)

According to the CIDB (2016), the administrative procedures and financial management related to procurement at National, Provincial, and Municipal spheres of government are guided by the South African Legal Framework Act. The latter governs the attainment of socio-economic objectives through procurement, and gives some guidelines to the behaviour of parties involved in the procurement and provision of goods and services involving government entities(CIDB, 2016).Backed by Act 38 Of 2000, CIDB is responsible for checking the following activities (CIDB, 2016):

- a) Contracts for engineering and construction works
- b) Supply contracts for the procurement of construction materials and equipment
- c) Service contracts for construction, as well as professional services, and
- d) The disposal of excess materials, equipment and demolitions.

Since this study investigates the supply chain management units' performance in the construction industry in South African National and Provincial Departments of Public Works,

a proper implementation of construction procurement in the construction sector is crucial. This is prompted by the National Treasury Pillars of Procurement which has mandated the CIDB to take charge of construction procurement (CIDB, 2016). The National Treasury Pillars of Procurement are: overt and effective competition, value for money, ethics and just dealings, accountability and feedback, and equity. The CIDB Act mandates the CIDB (2016) to:

- a) Promote the standardisation of the procurement processes
- b) Kick-start, promote and execute national programmes and projects intended toward the standardisation of purchasing documentation, practices and methods
- c) Determine and establish best practice that promotes procurement and delivery management reform.

METHODOLOGY

Apragmatic research philosophy was adopted in this study using deductive research logics. A mixed method (semi-structured interview and open-ended questionnaire) approach was adopted. The reason for adopting the qualitative approach (in-depth interviews and open-ended questionnaire) is to uncover the depth (Yin, 2013; Leedy and Ormrod, 2014) of the challenges and problems faced by supply chain management units in the South African National and Provincial Departments of Public Works during the procurement processes. In-depth interviews and open-ended questionnaire were used to give meaning and to have good understanding of the complexities and challenges surrounding the supply chain management units and decision making processes. The participants were the heads of supply chain management units in the National and Provincial Departments of Public Works.

The senior management executives consisted of the Head of Supply Chain Management units. The study used the themes and constructs identified during the review of literature (Saunders *et al*, 2016). Pilot surveys were undertaken to ensure that relevant constructs and themes are incorporated within interview protocols (Creswell, 2012). The researcher (interviewer) was granted approximately an hour interview with each of the management executives (interviewees) to uncover the challenges and problems encountered in the supply chain management units during the delivery of their construction projects. The interview questions covered the whole procurement processes right from the conception to completion stages. Terms abbreviated are Head of Department (HOD, HODA is the lead followed by HODB). Same also for Deputy Director General (DDG), Chief Financial Officer (CFO), Supply Chain Management (SCM), Human Resources Management (HRM) and Senior Project Manager (SPM) having same variants in leadership profile.

RESULTS AND DISCUSSION

The analyses of interviewees' responses show that there are substantial challenges and weaknesses besetting the performance of the public sector clients during the procurement process. There are issues of lack of qualified supply chain carders and lack of skills and expertise to adhere to their roles and responsibilities as required. Below (Table 1) are some of the excerpts from the interviewee's transcripts and open-ended responses:

The major issue of concern is non-adherence to the CIDB regulations on the delivery of projects. The lack of adherence to method 4 brought by the CIDB and lack of implementing the current infrastructure delivery management system (IDMS) also contributed to poor project outcomes experienced by User Departments (Table 2).

Table 1: Excerpts from the interviewee’s transcripts and open-ended responses on Procurement

S/N	Unit	Comments
1	HODA	Procurement is one of the serious challenges the Department is faced with.
2	Chief Accounting Officer M	There is no tighter adherence to procurement guide lines in terms of functionality which is essential.
3	Chief Accounting Officer B	Sincerely, procurement unit is not taken very serious and even the supply chain unit. You find people who are not yet qualified in the procurement and supply chain units. It is now that the departments are serious in re-structuring the procurement and supply chain units for better performance. For example, if you look up, what I’m having here, 90% of the staffs in procurement and supply chains are on contract, they are not permanent staffs. Furthermore, when you look at their skills and CV’s most of them are not procurement specialist and supply chain qualified.

Table 2: Excerpts from the interviewee’s transcripts on adherence to CIDB

S/N	Unit	Comments
1	Chief Accounting Officer M	DPW do not adhere to construction industry development board (CIDB) procurement guide lines, the Act is very clear and the guidelines are very clear on the selection of chain of contractors. There is a so called method 4 in the procurement of construction services. The DPW must strictly adhere to, and follow to the latter the method 4 brought by CIDB for the successful delivery of construction projects in South Africa. There is problem with the implementation of method 4 by DPW.
2	DDGB	IDMS need to be implemented fully to define professionals’ roles and responsibilities to ensure project flow.

The analyses of interviewees’ responses show that there are challenges with shortage of technical professionals in the supply chain management units, which contributes to poor project supervision and could also contribute to poor project outcomes. This is because of the DPW inability to manage and oversee the performance of SCM unit during procurement process due to shortages of SCM professionals as shown in Table 3.

Table 3: Excerpts from respondents on shortage of technical professionals in SCM units

S/N	Unit	Comments
1	SCMB	There is shortage of skilled Supply Chain Management cadres.
2	SCMA	Yes, our organogram does not meet the new Supply Chain Management structural requirements.

One of the major challenges in SCM unit is the long process it takes to award contracts and make necessary decisions during tendering stages. These are some of the open-ended responses from the respondents that concurred with the supply chain management issues, for instance, contract awarding coupled with delay by the procurement committees (see Table 4).

The analyses of interviewees’ responses show that DPW do employ the traditional method of procurement and competitive tendering process in the selection of main contractor. DPW

professionals believed that by using the traditional method, better monitoring of contractors' performance during the construction process would be achieved by monitoring the performance of the contractor and the progress of work. Another reason is that the legislation from the

Table 4: Excerpts from respondents on period of contract award and tendering stages

S/N	Unit	Comments
1	SPMA5	Procurement processes sometimes take long time.
2	SPMG3	Need to improve on procurement process.
3	SPME8	Supply Chain Management processes should also be evaluated due to the lengthy time it takes to award projects.
4	SPME7	Review of Supply Chain Management process in order to shorten the process, as it takes long time in current situation.

Parliament always encourages DPW to use the traditional method of procurement with competitive tendering strategy for transparency during tendering process. Table 5 shows the views of two chief accounting officers regarding the encouragement from the Parliament to use the traditional method of procurement and competitive tendering procedures during tendering stages:

Table 5: Excerpts from respondents on Parliamentary roles on procurement and tendering

S/N	Unit	Comments
1	Chief Accounting Officer B	We predominantly use traditional method or route and is also legislated by an Act (PFMA) but there are exceptions when the project is needed urgently, then you got an option of deviating from traditional and to come with a close tender method to use either design and build or turnkey but otherwise the legislation is to strictly use traditional method through competitive tendering procedures. The method we use is the open competitive tendering in selecting our contractor and that is what the legislation says and we must follow strictly. It is legislated. Remember, procurement is highly legislated like I said earlier on. It is encouraged that each time you must use competitive tendering processes with traditional procurement strategy for all government projects. For example, when you go by competitive tendering processes, when the tender is closed, most time there will be issues, instead to go out and tender again, we might invite those who tendered before to discuss the issues.
2	Chief Accounting Officer M	We will firstly advertise to the public. The general rule for procurement of services in Government setting is that every service rendered should be given out there to the public to compete for. Yes, competitive tendering. Only in certain instances can you go for solicited tendering or selected or negotiated tendering, under very stringent conditions. In all our projects, we are employing a traditional method of procurement. For the reason that we believe it is less risky, you are able to check on progress. If you make a comparison, in design and build, there is not much scope for people to be able to monitor. A lot is left to the contractor for arguments sake, but we use the traditional one because we would like to have our checks and balances, and that with government legislation is very clear. We need to realise value for money for taxpayers.

Table 6 shows the heads of operational units' open-ended responses regarding supply chain management challenges in the National and Provincial Departments of Public Works.

S/N	Unit	Comments
1	HODB	Specialists' construction unit to be established for procurement.
2	SCMD	User Departments want to dictate which buildings they want to rent and the Department of Public Works has to follow the due Supply Chain Management processes to secure accommodation.
3	SPME10	To look into contracts that are used in infrastructure in a public sector that always favours the private sector.
4	DDGG	In Supply Chain Management section, many a time's blame is laid on Supply Chain Management committees where there is lack of or slow performance in implementation of various infrastructure projects.
5	SCMI	Secondly, all government objectives cannot become a "procurement burden". It causes the cost of compliance to sky rocket. Compliance requires time; time has a cost implication, and thus an efficiency implication.
6	SCMI	There must be a balance between compliance, overregulation and performance.
7	SPMI1	There must be an improvement regarding control measures with regards to procurement processes in terms of appointing service providers, however, investigation exercise must be undertaken before appointing service providers, by so doing will eliminate a number of cancellations and will improve service delivery. Internal control measures are inexistence regarding PFMA.
8	CFOF	Both the duties of contractors and consultants should be clearly defined.
9	SPMH7	The Department should always appoint skilled contractors and consultants.

CONCLUSION AND RECOMMENDATIONS

This research paper have shown that there are supply chain management challenges such as: insufficient SCM cadres; SCM decision making difficulty; contractual inequality; long SCM processes; and difficulty with selection of skilled service providers during tendering process. The supply chain management challenges contributed to poor performance of DPW professionals during procurement process. These supply chain management challenges have affected the performance of service providers (contractors and consultants) which led to time and cost overruns that eventually extended the duration and cost of projects.

Based on the research findings, it is recommended that the following issues be addressed by the National and Provincial Departments of Public Works as a matter of urgency:

- (a) Infrastructural delivery management systems (IDMS) devised by the construction industry development board (CIDB) (Act 38 of 2000) for uniformity in public sector delivery process need to be implemented fully to define the roles and responsibilities of part-takers or stakeholders to ensure smooth project flow.

- (b) To improve on procurement process as it takes longer time to deliver project in current situation.
- (c) A proper tendering processes and procedures are needed urgently to improve the current control measures with regards to procurement processes in terms of appointing service providers.
- (d) Since DPW predominately use traditional method of procurement where adversarial behaviours are experienced, therefore, the duties of consultants, clients and contractors should be clearly defined in the contract documents to avoid opportunistic behaviours from any contracting party.
- (e) To reduce the bureaucratic bottle necks in public sector process that most times delay project delivery.
- (f) DPW should endeavour to approve projects within the stipulated time (21 working-days).

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