Proceedings of International Structural Engineering and Construction
Holistic Overview of Structural Design and Construction
Edited by Vacanas, Y., Danezis, C., Singh, A., and Yazdani, S.

ISSN: 2644-108X

THE FACTORS MILITATING INTERNAL STAKEHOLDERS ON ROAD INFRASTRUCTURE PROJECTS

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There are numerous participants involved in construction projects including the client or sponsor of the project, regulatory bodies, contractors, consultants, ward councilors, community who affect or become affected by the project. Stakeholders can affect the road construction positive or negatively. Stakeholder's engagement is done to avoid unnecessary conflicts and controversies and to attain the desired successful implementation of the project. The paper aims to identify the impact of internal stakeholders on road construction project. Quantitative approach was adopted for this study. 100 questionnaires were distributed and 76 were collected and analyzed. The data was collected through primary and secondary sources. Factor analysis was conducted, Correlation matric coefficients has been conducted to ensure visibility of coefficients greater than 0.3 and Kaiser-Meyer-Olkim (KMO) and Barlett's test were conducted. From the findings it transpired that late payment to service providers; failure to verify contractor qualification; Client knowledge to review design documentation; inadequate involvement during construction project, lack of understanding project feasibility. The participation of stakeholders encourages the public to share their knowledge with the regulatory authorities, fosters better-informed decisions and decreases likelihood of project failure. Early stakeholder's involvement can add benefits of diffusing opposition to a project.

Keywords: Performance, Projects stakeholders, Participants, KMO test, Barlett's test.

1 ROAD INFRASTRUCTURE IN SOUTH AFRICA

South Africa has road networks of about 747000 km which is the longest road network in Africa (SATCC 2017). The Department of Transport is responsible for overall policy. Road construction/building and maintenance are the responsibility of SANRAL as well as the nine provinces and local governments. SANRAL is responsible for the network national roads, which cover approximately 16200 km, 185000 km of provincial roads, 66000 km municipal network roads, and 185000 km of provincial roads according to the South African Institute of Civil Engineering. National toll roads of approximately 19% are maintained by SANRAL while the rest have been allocated to private companies to develop, operate and maintain (SATCC 2017). Roads play a significant role in the economic development of effective infrastructure as the precondition for

national growth. By investing in roads infrastructure, the cost of transport and communication can be reduced.

Good roads improve safety, capacity and traffic flow for all users, it also benefits economy, social and environment (TRH 26 2012). Moreover, roads make our life easier in many ways as they link province to province even into other neighboring countries of South Africa. They boost the economy of the country in terms of transporting goods, mineral resources in mining, farming and improve the access of different facilities such as schools, hospitals, shopping centers, work-places and recreation centers (Mashwama *et al.* 2018). Thus, the paper is investigating the factors militating internal stakeholders on the road construction projects in South Africa.

2 THE ROLES AND IMPACT OF STAKEHOLDERS ON PROJECTS

It is very important to identify the impact of stakeholders on a given project by identifying their necessary roles in a project. Stakeholders' may be grouped according to their grading, interest and attitude regarding project outcomes. Those three dimensions will determine whether the stakeholders are backing (support) or blocking (resist) the project outcomes (Assefa *et al.* 2015). Some of the stakeholders have a negative impact on the project and some of the stakeholders have a positive impact in the project (Buertey *et al.* 2016). Stakeholders can affect organizational functioning, goals, development and even survival. Stakeholders can be beneficial when they help to achieve goals, however, stakeholders can be disadvantageous when they oppose the mission and goals. All in all, stakeholders have the power to be a threat or a benefit to an organization (Chinyio and Olomolaiye 2010). Stakeholders are human beings or companies that are actively involved in the project or whose interests may be affected because of project execution or project completion. In construction stakeholders are the client, consultant, contractor, suppliers, community leaders, or service providers. Stakeholders can be divided into different categories such as internal and external or primary and secondary (Chinyio and Olomolaiye 2010). Stakeholders who are directly involved in decision making and operations of the project are considered as primary or direct stakeholders whilst stakeholders without any direct relationship and operating remotely from the project are considered secondary, indirect or outside stakeholders (Newcombe 2003).

3 INTERNAL STAKEHOLDERS

3.1 Client

A client is the person or firm responsible for commissioning and paying for the design and construction of a facility being commissioned. The success of the project depends as much on the client as it does on the consultants and contractors (Alinaitwe 2008). The degree of client involvement is based on taking the right decision during the construction project process and that is determined by the weight of the client experience. The common expectations of the client are to complete and deliver a project with high quality, low cost and finished on time. Client involvement in the construction process provides the link between the client and the project (Triqunarsyah and Sodaiman 2016).

3.2 Consultant

The consultants such as engineers, architect, quantity surveyor, project manager's etc, are like an employer's agent. Consultants make sure that the project is completed within budget, of good quality, against technical specifications and design standards, and on time, giving the client/employer value for money (Dadzie *et al*. 2012). The impact or effects of consultants' work-

ing long hours include industrial and social problems, family breakdown, and physical, and psychological health problems in general and it also reduced alertness and concentration (Dadzie *et al*. 2012).

3.3 Contractor

Contractor is a self-employed independent businessperson who agrees (contracts) to do work for another party, usually for a fixed price. The failures of contractor are abandonment of project, liquidation /bankruptcy, damage to company's reputation, loss of skilled workers, default on loan repayment by the contractor, and stress on the contractor, among others (Dadzie *et al.* 2012).

4 METHODOLOGY

Quantitative approach was adopted for this study. The data was collected through primary and secondary sources, 100 structured questionnaires were distributed to construction stakeholders and 69 came back, which were eligible to use. A five-point Likert scale was used to determine the impacts of internal stakeholder's on the road construction infrastructure projects in the Gauteng province, South Africa. The adopted scale was as follows: 1=Strongly disagree; 2=Disagree; 3=Neutral; 4=Agree and 5=Strongly agree. The computation of the mean item score (MIS) was calculated from the total of all weighted responses and then relating it to the total responses on an aspect. After mathematical computations, the criteria are then ranked in descending order of their mean item score (from the highest to the lowest). The test of hypothesis was conducted through the factor analysis. These include the assessment of the suitability of data for analysis; Correlation matric coefficients has been conducted to ensure visibility of coefficients greater than 0.3 and after the conduction of coefficients and findings that it is greater than 0.3, Kaiser-Meyer-Olkim (KMO) and Barlett's test was conducted. Kaiser's criterion used as it applies the eigenvalue rule to eliminate and extract factors. Any factor with eigenvalue, which is less than one (1) was eliminated, factor, which is greater than one (1) was retained.

5 FINDINGS

Table 1 revealed the respondent response on the impact of internal stakeholders, Under the client related factors respondent ranked late payment to service providers first with (M=3.59; SD=1.253); ranked second was client who failed to verify contractors' qualifications with (M=3.58; SD=0.858); Client knowledge to review design documents was ranked third with (MIS=3.42; SD=1.063); Inadequate involvement by client during construction project was ranked fourth with (MIS=3.42; SD=1.148); Conflict between client & contractor due to client lack of attention to provide necessary information for tendering was ranked Fifth with (MIS=3.29; SD=1.139); Lack of understanding project feasibility study during planning phase was ranked sixth with (MIS=3.19; SD=1.163); Lack of client knowledge to interpret the contract document and drawings was ranked tenth with (MIS=3.10; SD=1.311); Establishment for acceptance criteria for completion certificate was ranked eight with (MIS=3.04; SD=1.142); Low level to approve project cost was ranked tenth with (MIS=3.04; SD=0.992). Under Consultant related factors lack of experience by the consultant was the only factor which had (MIS=3.17; SD=1.178); under contractor related factors, contractor taking too long to pay subcontractor was ranked first with (MIS=3.8; SD=0.979); lack of resources was ranked second with (MIS=3.69; SD=1.214); and Contractors' poor performance was ranked third with (MIS=3.62; SD=0.929); and Contractors' incompetent technical skills was ranked last with (MIS=3.35; SD=1.139).

Table 1. Factors militating internal stakeholders' on road infrastructure projects.

Item	Factor	M	SD	Cronbach's Alpha	Rank
Client related factors					
CLRI 9	Late payment to service providers	3.59	1.253	0.858	1
CLRI 7	Failure to verify contractor's qualifications	3.58	1.253	0.858	2
CLRI 2	Client knowledge to review design documents	3.42	1.063	0.863	3
CLRI 1	Inadequate involvement by client during construction project	3.42	1.148	0.866	4
CLRI 4	Conflict between client and contractor due to client lack of attention to provide necessary information for tendering	3.29	1.139	0.857	5
CLRI 5	Lack of understanding project feasibility study during planning phase	3.19	1.163	0.861	6
CLRI 8	Lack of client knowledge to interpret the contract document and drawings	3.10	1.311	0.861	7
CLRI 6	Establishment for acceptance criteria for completion certificate	3.04	1.142	0.871	8
CLRI 3	Low level to approve project cost	3.04	0.992	0.866	9
Consultant related factors					
CTRI 3	Lack of experience by consultant	3.17	1.178	0.872	1
Contractors related factors					
CRR1 1	Takes too long to pay sub-contractors	3.80	0.979	0.870	1
CRR I 4	Lack of resources	3.69	1.214	0.864	2
CRRI 2	Contractors' poor performance	3.62	0.929	0.865	3
CRRI 3	Contractors' incompetent technical skills	3.35	1.139	0.857	4

5.1 Factor analysis results

Correlation matrix of fourteen variables was conducted and three variables were omitted as communality was > 1 on one variable, which was regarded as a weak item or variable. Two variables were omitted due to measures of sampling adequacy (MSAs). Correlation matric coefficients have been conducted to ensure visibility of coefficients greater than 0.3 and there were quite a number of correlations greater than 0.3 which tentatively suggests that factor analysis was appropriate. Table 2 indicates the Kaiser-Meyer-Olkim measure of sampling adequacy (KMO-test). The value was 0.781, which exceeded the required value of 0.6 (Kaiser,1960). The Barlett's test of sphericity reached statistical signature of $p=0.000$, $p < 0.05$.

Table 2. KMO and Bartlett's test of the internal stakeholders.

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		**0.781**
Bartlett's Test of Sphericity	Approx. Chi-Square	393.697
	df	91
	Sig.	0.000

Table 3 explains the total variance of the internal stakeholders' impact on performance in roads infrastructure projects and four components had eigenvalues of above 1, namely (5.360; 1.791; 1.131 and 1.038). The components' eigenvalue defined the 38.29%; 12.791%; 8.081% and 7.415 % respectively of the variance which indicates 66.575% of the total variance before rotation and 54.087% after rotation. Four components based on the results of scree plot are depicted in Figure 1.

Table 3. Total variance explained of the internal stakeholders' impact.

Factor	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	**5.360**	38.288	38.288	4.925	35.180	35.180	2.487	17.763	17.763
2	**1.791**	12.791	51.079	1.457	10.408	45.589	1.913	13.665	31.428
3	**1.131**	8.081	59.160	0.675	4.821	50.410	1.879	13.424	44.851
4	**1.038**	7.415	**66.575**	0.515	3.677	54.087	1.293	9.235	**54.087**

Extraction Method: Principal Axis Factoring.

Table 4 indicates the total of fourteen variables loaded on four components and the results were strengthened by a scree plot test. Varimax with the Kaiser normalization rotation method was used, and the method revealed the variables loaded on four factors. Most of the variables loaded strongly on factor 1, followed by factor 2 and factor 4 with equal variables, then by factor 3 with two variables.

Table 4. Rotated factor matrix of the internal stakeholder's impacts.

	1	2	3	4
CLRI2	**0.844**			
CLRI5	**0.671**	0.275		
CLRI1	**0.567**	0.320		
CLRI4	**0.540**	0.457		
CLRI6	**0.473**			
CLRI3	**0.421**	0.292		
CLRI7		**0.697**		
CLRI8		**0.629**		0.306
CLRI9		**0.535**	0.350	
CRRI1			**0.906**	
CRRI2			**0.716**	0.289
CRRI3	0.279	0.328	0.299	**0.635**
CRR14			0.495	**0.606**
CTR13		0.322		**0.386**

Extraction Method: Principal Axis Factoring.
Rotation Method: Varimax with Kaiser Normalization.[a]
a. Rotation converged in 8 iterations.

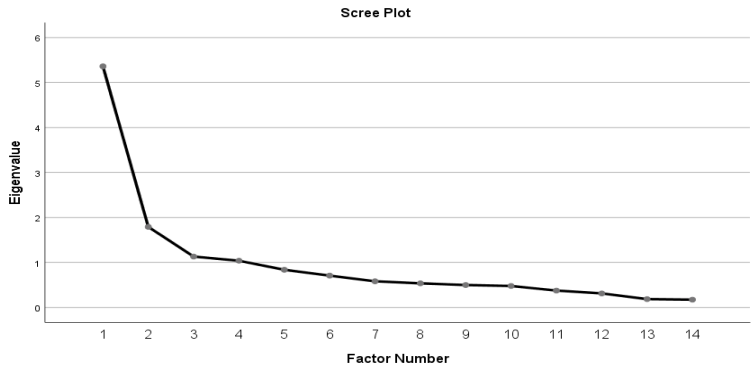

Figure 1. Scree plot of internal stakeholders impact.

Component 1 Management control: The factor 1 (ISI 1) encountered 38.288 % (Table 1) of the total variance of the internal stakeholders'' impact on road infrastructure projects which was valid. Factor 1 was named 'management control' by the variables group in factor 1. The component emphasized the corporation of clients in terms of approving the project cost, reviewing the design document and the establishment for acceptance criteria for the completion certificate. Conflict between client and contractor is normally caused by the type of contractor. Therefore, establishing the legality of a contract is recommended to avoid conflict between the parties involved.

Component 2 (ISI 2) was given 'client cooperation' as a name as many factors pointed to the client of the project. If the client does not pay the service providers on time, the service provider ends up in liquidation, default and having difficulties to repay the bank loans due to the late or non-payment by the client. The component defined the following variables, namely CLRI 7, CLRI 8 and CLRI 9 (See Table 1).

Component 3 (ISI 3) gives the insight into the running of the construction site, how site construction is managed and supervised, and its challenges. Poor performance by the contractor results in poor quality and low productivity. Planning management, site supervision by applying proper methods such as proper communication, utilization of latest technology and regular meetings could help to manage a site properly. The component defined CRRI 1 and CRRI 2 variables (See Table 1).

Component 4 (ISI 4) explained the inability of the service providers who have limited knowledge of running the project. Service providers are like the client's agent as they ensure that the project is completed on time, within budget and completed with the right quality and standard. Service providers give value for money to the client. The component defined the following variables: CRRI 3, CRRI 4 and CTRI 3 (See Table 1).

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