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MANAGEMENT STYLE AND QUALITY OF MANAGEMENT DURING CONSTRUCTION INFLUENCES ON PROJECT DELIVERY TIME

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Abstract
Construction projects are becoming complex in nature, therefore control is fundamental requirement to avoid overruns of key performance parameters. The aim of the study is to identify influencing factors of management style and quality of management during construction on project delivery time with a view to mitigating their impact. A questionnaire survey was conducted among stakeholders in the Building Construction Industry to access influencing factors of management style and quality of management during construction. Finding relative to management style include that set time limits, specify goals people are to accomplish and require regular reporting on progress and for quality of management during construction are effectively coordinating resources, developing an appropriate organization structure to maintain workflow influences project delivery time In most cases these tradesmen require supervision construction, which results in delay and attending, may drastically reduce delay on projects. Based on the finding of the study, ways to mitigate poor management style and quality of management during construction were suggested.

Keywords: Construction, Delivery time, Management, Quality, Style

1 Introduction

Construction involve a lot of tasks, which are executed by tradesmen. In most cases these tradesmen require supervision in order to deliver the work according to specification and quality. The extent of management of these tradesmen with respect to the level of supervision given and management style will determine the quality of product. Management style dictates the quality of quality of product as happy workers engenders commitment to work leading to high productivity and quality products. Generally, workers do not want to be coarse to work. There is a need to balance supervision with the management style being adopted to achieve the optimum level of production and quality. This study assesses influence of management style and quality of management during construction on the delivery of projects in South Africa.

2 Literature Review

2.1 Management style

Management style deals with the personal attributes possessed by the manager in managing an organisation. Managers operate within an organisation and manage the functions of an organisation. These attributes possessed by managers that enable them to succeed are called competency. Rees and Porter (2001) define competence as the skills or knowledge possessed by individuals that enables them to manage an organisation successfully. Smallwood (2006) states that competencies can be divided into two categories: threshold or surface, which are required to be minimally effective and differentiating or core, a yardstick for superior performers.

The threshold or surface competencies are:

- Knowledge – information regarding content, and
- Skills – the ability to perform a task.

According to Singh (2004), competences can predict performance. Goals need to be defined before actions are taken and performance measured. There are three types of goals, namely:

- Organisation-wide goals – these include objectives pertaining to future directions for large segments of the organisation population;
- Task-oriented goals – they are specific objectives assigned to an individual or small group of individuals, and
- Personal goals or level of aspirations – these are goals set by the individuals themselves.

Fryer (2004) points out that many kinds of leadership study have taken account of the leader's competence or ability, either in the limited sense of technical ability or the wider sense of competence to lead. For an effective and efficient management of human resources, both the technical ability and competence to lead must be employed and could be referred to as management style.

The technical ability concerns the laying down of the construction methods and the drawing up of the schedule of works. The competence to lead refers to the motivation and support given to workers.

Griffith and Watson (2004) identify three management styles. These are exemplified by the following types of leaders:

- Autocratic leaders: They give orders which they insist shall be obeyed; determine policies for the group without consulting it; give no detailed information about future plans but simply tell the group what immediate step it must take; give personal praise or criticism to each member on their own initiative and remain aloof from the group for the greater part of the time;
- Democratic leaders: They give orders only after consulting the group; see to it that policies are worked out with the acceptance of the group (this is critical for effective implementation); never ask people to do things without sketching out the long-term plans on which they are to work; make it clear that praise or blame is a matter for the group and participate in the group as a member, and
- Laissez-faire leaders: They do not lead, but leave the group entirely to itself and do not participate.

2.2 Factors influencing management style

The factors that influence management style are discussed below. These include:

2.2.1 Specific goals people are to achieve

Pheng and Chuan (2005) state that the defining of goals affects project performance positively. The overall goal of an activity must be set out for each individual. This will be the driving force for day-to-day achievement and overall accomplishment of the goal. Goal-setting can inspire and motivate sub-ordinates, especially if their achievement is linked to remuneration. It also provides an effective means of evaluation and control (Du Toit et al., 2007). Additionally, when staff participate in the decision-making process of the organisation, it creates a sense of belonging which leads to individuals paying greater attention to their jobs. These create an environment conducive for work, resulting in high productivity.

2.2.2 Organise the work situation

One of the factors influencing performance in construction projects is sequencing of work and the allocation of crew sizes. Rojas and Aramvareel (2003) are of the opinion that out-of-sequence scheduling of work may result in a loss of momentum (rhythm). Walker and Shen (2002) suggest that contractor-related factors such as poor site management and supervision are major causes of delays in project delivery. Lack of organisation creates a situation of confusion and chaos, a situation in which no meaningful progress can be made. A site that is well laid out, in which offices, storage, and work spaces are well defined, aids the smooth flow of work.

2.2.3 Set time-lines

For the achievement of targeted production, time limits should be set for each task to be carried out. A bricklayer has a certain number of bricks to lay per day, depending on the type of brick. A fitter has a certain number of tones / kilograms of steel to bend or cut for a day's wage, and this applies to all trades. Based on this analogy, time lines are set for the achievement of each activity in order to avoid delay as clear time-lines promote more efficient and goal-driven work.

2.2.4 Provide specific direction

Managers or site engineers are supposed to provide specific direction on what must be done and how it must be done. Bassioni et al. (2005) declare that one factor that enhances performance is the development of the organisation's mission, vision and values by a leader and communication of these attributes to the workforce. Pheng and Chuan (2005) conclude that thirteen factors affect project performance negatively, among which is the availability of information. When this is lacking errors may occur, which may lead to poor workmanship and repetition of work. When these situations occur, the project will suffer delays.

2.2.5 Conduct regular updates on progress

Edum-Fotwe and McCaffer (2000) identify management skills such as time management and leadership as having a positive effect on construction project delivery. Chan et al. (2004) argue that a project leader's commitment to time affects the delivery of a construction project. A work schedule is a tool that is used to monitor the progress of work. In order to avoid delays in project delivery, the performance of the project should be evaluated regularly on this through work schedule. This helps in identifying areas of poor performance.

2.2.6 Seek people's opinion and concern

Management of an organisation should not only be concerned about work performance, but also about staff welfare. Management should not turn a blind eye to staff challenges. There should be a means for the personal challenges of workers to be made known to management. The labourers and skilled labour are those who perform construction activities with guidance from management staff, therefore their health is crucial to the speedy completion of a project. These are all factors that create job satisfaction and boost productivity.

2.3 Quality of management during construction

The study by Ponpeng and Liston (2003) of contractor ability criteria determined, inter alia, a contractor's quality management system is an important factor affecting a contractor's delivery of a project within schedule. Below are discussed the factors relative to quality of management during construction.

2.3.1 Forecasted planning date such as activity duration, resource quantities required

Planning tool is an aid for an effective, smooth flow and control of works during the construction phase. Arditi and Mohammadi (2002) conclude that timeliness, which is completion of the contract on the scheduled date, and accuracy, which is the ability to provide the right service performance may be uncovered and solutions found.

2.3.2 Analysis of construction methods

An analysis of construction methods is the consideration of the various techniques to carry out work against the volume and complexity of work, which will result in timeliness, cost effectiveness, quality product, and safety. Failure to do this might result in mistakes and rework. Proverb and Holt (2000) declare that construction methods adopted in the procurement of a project significantly relate to construction time performance. Belout and Gauvreau (2003) declare that trouble-shooting was identified as the second highest factor that explains project success in the execution stage in their study.

2.3.3 Resource movement to, on and from site

Koushki and Kartam (2004) declare that late delivery and damaged materials to site cause project delays, for instance, if there is not a particular material on site such as cement. The process it will take for replacement / purchase might lead to delays. Pertula et al. (2003) report that a total of 2 945 disability days were experienced on a project over a period of eighteen months due to accidents resulting from materials handling on site. This has a negative impact on the delivery of the project on time, with respect to machine requirements. A schedule of movement of heavy machines should be made in order to maximise the cost of hiring and movement to and from the site. Prior to a machine arriving on site the specific quantity of work to be done must have been identified. This will eliminate the situation of having the machine standing idle while work is not completed. Koushki and Kartam (2004) declare that poor planning, equipment breakdown and improper equipment lead to delays in the project.

2.3.4 Work sequencing to achieve and maintain work flow

According to Fox et al. (2003), to realise building designs, practitioners with expert knowledge should be employed in assessing the capability of construction processes. This will aid the comparison of construction methods of contractors against its adequacy regarding the project technology demand. On awarding the contract, the architect or the project manager requests the contractor to provide a work schedule and construction method statement. These explain the activities of work from site clearance to handing over of the site to the client. In other words, specific duration of activities fixed thereon and construction methods are identified. There are several planning tools employed in doing this. Among these are bar charts, the CPM, the S-curves as well as others, but the most commonly used planning tools are the bar chart and the CPM. These tools are used in achieving and maintaining workflow.

2.3.5 Monitoring and updating of plans to appropriately reflect work status

Lee et al. (2004) cite lantelme and Formoso (2000) who conclude that measurement-managed companies have shown better performance compared to their non-measurement counterparts. In order to measure the performance of a project, tools such as the CPM and bar chart are developed to monitor work status. In situations where the project is not performing as planned,

areas of weakness are identified and improved on for the achievement of overall goals. Pongpeng and Liston (2002) identify project monitoring as one of the five most important criteria for contractors' ability to perform.

2.3.6 Responding to, and recovering from problems or taking advantage of opportunities present

If a project has to repeat one of its activities, it will take longer (Hardie, 2001). There may be a multiple effect of this problem on activities, which may later lead to stagnation of works on site. These problems are identified by the daily progress record maintained on site. Where there is a lag, problems leading to it are identified. This is responding to a problem. When problems are identified, they are addressed. This implies remedying the situation and sorting out the problems. Once these are solved, the project is restored into full operation. This method employed in solving a problem could be applied to similar problems and where the project is performing well the method adopted in achieving such success should be documented and used repeatedly. Dainty et al. (2004) state that for a project to succeed, there are some qualities the project manager must possess. Among these are analytical thinking power, information seeking and initiative. These will enhance problem-solving on site. Scott-Young & Samson (2007) conclude that there is a direct and positive relationship between effective team problem–solving and project outcomes.

2.3.7 Effective coordination of resources

Tam et al. (2002) declare that site layout planning assists in minimising the travelling time and movement costs of plant, labour and materials, activity interference during construction work and site accidents. Chan et al. (2004) state that the coordinating skills of the project team leader affects the construction of a project. Kazaz and Ulubeyli (2003) are of the view that assignment decisions of resources such as labour, equipment and materials control the overall duration and cost of a project. Additionally, a good inventory system must be put in place for recording materials on site for each section, for example, concreting, carpentry, reinforcement works and mechanical and electrical work. The materials movement schedule should be developed alongside the work schedule sheet. This will afford effective coordination of resources with respect to materials in stock, materials needed and ordering dates. Together these will ensure a smooth flow of activity and timely delivery of the project. Jha and Iyer (2005) maintain that coordination among project participants and resources positively influence the delivery of projects.

2.3.8 Development of an appropriate organisation structure to maintain workflow

Bassioni et al. (2005) say that the involvement of leaders in ensuring that management systems are developed for operations is an important performance factor for success. For an organisation to function effectively there should be an organogram showing the hierarchy of authorities and the various departments in the organisation. Duties and responsibilities are spelt out to each department which assist with accountability.

3 Research Methodology

A study titled influence of management style and quality of management during construction was undertaken to identify and assess factors influencing the delivery of project relative to schedule. The study was conducted in Port Elizabeth in South Africa. The sampling frame consist architects 1149 (SAIA); master builders 320 (MBA); clients 161 SAPOA); structural engineers 43 (CESA - East Cape), and *quantity surveyors 473 (ASAQS). From these* the calculation of the sample size *were made questionnaire response rate according to*

professional is given as: architects (9), master builders (18), quantity surveyors (23), and structural engineers (23), clients (12) and others (3).

Probability sampling technique was employed for sample selection. For the Architects, Master Builders, and the Clients random sampling was used. Systematic sampling techniques was used for the quantity surveyors, and for the structural engineers and other the entire sample were surveyed based on the recommendation of Leedy and Omrod (2005). The research instrument for this study was a questionnaire survey, which was administered to respondents through post (Architects, MB, Structural engineers, and others) and e-mail (Quantity Surveyors). These were received through the same means. Cronbach's coefficient test and validity test were performed and were found satisfactory. Cronbach's alpha of ≥ .97 and factor loading of >.60 for samples sizes 85-89 were obtained.

A total of eighty-eight (88) questionnaires representing 6.1% response rate achievement recorded on questionnaire administration. Inferential analysis was used to statistics statistical tool was used for data analysis.

A five-point Likert scale adjoined with 'Unsure' and 'Does not' options was employed to analysis summated scores of the respondent's responses. Given that there are five points on the scale, and that 5 – 1 = 4, the ranges were determined by dividing 4 by 5 which equates to 0.8. Consequently the ranges and their definitions are as follows:

- > 4.20 ≤ 5.00 between a near major to major / major influence;
- > 3.40 ≤ 4.20 between moderate influence to a near major / near major influence;
- > 2.60 ≤ 3.40 between a near minor to moderate influence / moderate influence;
- > 1.80 ≤ 2.60 between a minor to near minor influence / near minor influence, and
- > 1.00 ≤ 1.08 between a minor to near minor influence.

Majority of the respondents belong to the private sector (74%), their average working years is 17, and over the age of thirty (30). Respondents with Bachelor's degree 25% predominate, and respondents have handled not less than six (6) types of projects. Based on these data obtained can be deemed reliable.

4 Findings and Discussion

4.1 Management style adopted

Table 1. The influence of management style factors on project delivery time

Factor	Response (%)								
	Unsure	DN	Minor.....Major					Mean score	Rank
			1	2	3	4	5		
Set time lines	2.3	0.0	3.5	0.0	14.9	37.9	41.4	4.13	1
Specify goals people are to accomplish	4.6	0.0	1.1	5.7	10.2	40.9	37.5	4.06	2
Require regular reporting on progress	2.3	1.2	2.3	3.5	17.4	37.2	36.1	3.97	3
Provide specific direction	3.5	0.0	2.3	4.6	17.2	37.9	34.5	3.96	4
Organise the work situation for people	4.6	1.2	2.3	9.2	12.6	41.4	28.7	3.79	7
Involve team members through discussion of work	2.3	1.2	1.2	4.8	20.2	35.	34.5	3.93	5
Provide support and encouragement	3.5	1.2	1.2	4.7	23.5	34.1	31.8	3.85	6
Organise the work situation for people	4.6	1.2	2.3	9.2	12.6	41.4	28.7	3.79	7
Seek people's opinion and concerns	5.0	1.3	2.5	12.5	27.5	25.0	26.3	3.54	8

Table 1 presents the respondents' rating of the influence of management style factors on project delivery time in South Africa. It is notable that all factors in this category have MSs > 3.40 ≤ 4.20, which indicates that these factors have between a moderate to near major / near major influence on project delivery time.

The factor that has the most influence on project delivery time in this category is setting time lines. This is close in agreement with the view of Rojas and Aramvareel (2003) that out-of-sequence scheduling of work may result in a loss of momentum (rhythm).per time and subsequently lost in production. In order to achieve meaningful progress, managers need to define the number of tasks to be performed within a specified time. The lack of specification of time lines for the performance of activities may have an adverse effect on the delivery of projects. Construction activities have been described as difficult and masculine in nature. There are measures such as setting time lines which need to be applied for meaningful productivity to be achieved.

The next significant factor is specifying the goals that people are to accomplish. Construction projects consist of activities and these activities need to be specified to workers and supervisors through information given by management for monthly, weekly or daily task executions until project completion. This is partly the reason for the need to provide a work schedule. When these details are not adhered to, it may have an adverse effect on the delivery time of projects. This agrees with the declaration of Pheng and Chuan (2005) that the defining of goals affects project performance positively.

The least significant factor in this category, is sorting peoples' opinions and concerns. It is a managerial tool used for higher productivity, which is often not utilised. Workers are not very skilful in contributing ideas to improve work execution. Most of the workers are afraid to speak to their supervisors. These are the most likely reasons for this factor having the lowest impact on project delivery time.

4.2 Quality of management during construction

Table 2. The contribution of quality of management during construction factors on project delivery time

Factor	Response (%)							Mean score	Rank
	Unsure	DN	Minor.....Major						
			1	2	3	4	5		
Effectively coordinating resources	3.5	0.0	2.3	4.7	19.8	36.1	33.7	3.92	1
Developing an appropriate organisational structure to maintain workflow	3.5	1.2	1.2	5.8	19.8	361	32.6	3.88	2
Forecasted planning date, e.g. activity duration, resource quantities required, etc.	4.7	1.2	4.7	4.7	16.3	37.2	31.4	3. 80	3
Responding to recover from problems or taking advantage of opportunities presented	6.9	0.0	2.3	6.9	21.8	32.2	29.9	3.77	4
Monitoring and updating plans to appropriately reflect work status	2.4	0.0	3.5	10.6	29.4	23.5	30.6	3.66	5
Analysing of work sequencing to achieve and maintain workflow	2.4	0.0	3.5	10.6	29.4	23.5	30.6	3.66	6
Analysing resource movement to and on site	3.6	1.2	1.2	13.1	29.8	32.1	19.2	3.50	7
Analysing construction methods	2.4	3.5	4.7	7.1	35.3	28.2	18	3.38	8

Respondents were required to rate the influence of quality of management during construction factors on project delivery (Table 2). Seven out of eight factors have MSs > 3.40 ≤ 4.20, which indicates that factors have between a moderate to a near major / near major influence on project delivery time.

The most influential factor in this range is effectively coordinating resources. The lack of effective control of resources, namely machines, materials and human resources may lead to disorder on construction sites. A clash of activities, which may in turn lead to a lack of materials on site and a shortage of labour on site, may in turn result in low productivity. These all have an adverse cumulative effect on delivery time of project. This factor concur with the findings of Chan et al. (2004) that the coordinating skills of the project team leader affects the construction of a project and Kazaz and Ulubeyli (2003) who are of the view that assignment decisions of resources such as labour, equipment and materials control the overall duration and cost of a project.

The next significant factor is developing an appropriate organisational structure to maintain workflow. Construction activities are carried out by issuing instructions, and providing guidance and support. Instructions are given by superiors to subordinates. The labourers and supervisors must be aware of whom they must take instructions from and to whom to report to. A situation where these are not well defined may lead to poor performance on the project. A well-defined organisational structure will assist in the maintenance of steady workflow. This finding is in line with the finding of Bassioni et al. (2005) declaring that the involvement of leaders in ensuring that management systems are developed for operations is an important performance factor for success

The factor with the lowest MS in this range is analysing movement of resources to and from the site. The various times resources are required on site should be estimated in order to avoid idleness which engenders waste. These could be in the form of time losses, which is indirectly wasting money, and may lead to bankruptcy and abandonment of the project. Koushki and Kartam (2004) declare that late delivery and damaged materials to site cause project delays.

The findings of this study agrees with most findings of studies that have being conducted in different countries in the world. With respect to management style adopted on workers specification of goals workers are to achieve was declared by Pheng and Chuan (2005) as adversely affect workers productivity when they are not set. Relative to quality of management during construction these were found: effectively coordinate resources (Tam et al., 2002); develop appropriate organization structure (Bassiani et al., 2003), and forecasted planning date (Arditi and Mohammed, 2002) as having adverse effect on project delivery time, when adequate measures are not in place to mitigate their effect on project delivery time.

5 Conclusion and Further Research

5.1 Conclusions

The study reached these conclusions, that the following adversely affects project delivery time when attention are not given to them: set time lines, specify goals people are to accomplish, require regular reporting on progress, effectively coordinating resources, developing an appropriate organisational structure to maintain workflow, and forecasted planning date, e.g. activity duration, resource quantities required, etc. In order to mitigate the effect of the findings, it is recommended that weekly planning of resources and gang size should be developed. This is relative to mitigating materials shortages and achievement of target output of production, and ensuring correct activity sequencing. In addition, selecting adequate gang sizes to task.

Identification of key performance factors such as physical and socio-cultural factors that could impede on construction speed are recommended for further research.

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